

## **Towards the use of Remote Sensing for Identification of Building Damage, Destruction, and Defensive Actions at Wildland-Urban Interface Fires**

[www.nrfirescience.org/resource/24258](http://www.nrfirescience.org/resource/24258)

Post-fire remote sensing provides a promising tool for assessing building damage, destruction, and defensive actions from wildland fire. However, limited studies exist to guide image acquisitions. Consequently, we compare remotely piloted aircraft systems and satellite post-fire imagery to ground-based assessments from the 2017...

Author(s): Derek McNamara, William E. Mell

Year Published: 2022

Type: Document

Book or Chapter or Journal Article

## **A burning concern: family forest owner wildfire concerns across regions, scales, and owner characteristics**

[www.nrfirescience.org/resource/24672](http://www.nrfirescience.org/resource/24672)

While there is a large literature on how individual homeowners perceive location-specific wildfire hazard, there is only one study specific to U.S. family forest owners. Using respondents from the United States Department of Agriculture (USDA) Forest Service's National Woodland Owner Survey of family forest ownerships in the United...

Author(s): Brian Danley, Jesse Caputo, Brett J. Butler

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Book or Chapter or Journal Article

## **Human ignitions on private lands drive USFS cross?boundary wildfire transmission and community impacts in the western US**

[www.nrfirescience.org/resource/24308](http://www.nrfirescience.org/resource/24308)

Wildfires in the western United States (US) are increasingly expensive, destructive, and deadly. Reducing wildfire losses is particularly challenging when fires frequently start on one land tenure and damage natural or developed assets on other ownerships. Managing wildfire risk in multijurisdictional landscapes has recently become...

Author(s): William M. Downing, Christopher J. Dunn, Matthew P. Thompson, Michael D. Caggiano, Karen C. Short

Year Published: 2022

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Book or Chapter or Journal Article

## **An interdisciplinary agent-based multimodal wildfire evacuation model: critical decisions and life safety**

[www.nrfirescience.org/resource/24193](http://www.nrfirescience.org/resource/24193)

This article applies an interdisciplinary agent-based model (ABM) of wildfire evacuation to the devastating 2018 wildfire in Mati, Greece, where the second-deadliest wildfire of the 21st century took place. This model integrates the natural hazard system (wildfire propagation) with the sociotechnical response system comprising...

Author(s): M. R. K. Siam, Haizhong Wang, Michael K. Lindell, Chen Chen, Eleni I. Vlahogianni, Kay Axhausen

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Book or Chapter or Journal Article

## **Beyond a focus on fuel reduction in the WUI: the need for regional wildfire mitigation to address**

### **multiple risks**

[www.nrfirescience.org/resource/24683](http://www.nrfirescience.org/resource/24683)

There are thousands of communities and millions of homes in fire-prone wildland–urban interface (WUI) environments. Although future developments may be sited and designed to be more survivable and resistant to losses, an over-arching strategy is needed for those that are already at high risk.

Traditionally, most plans for...

Author(s): Max A. Moritz, Rob Hazard, Kelly Johnston, Marc Mayes, Molly Mowery, Katie Oran, Anne-Marie L. Parkinson, David A. Schmidt, Graham Wesolowski

Year Published: 2022

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Book or Chapter or Journal Article

### **Traditional Fire Knowledge: A Thematic Synthesis Approach**

[www.nrfirescience.org/resource/24484](http://www.nrfirescience.org/resource/24484)

Building fire-adaptive communities and fostering fire-resilient landscapes have become two of the main research strands of wildfire science that go beyond strictly biophysical viewpoints and call for the integration of complementary visions of landscapes and the communities living there, with their legacy of knowledge and subjective...

Author(s): Carmen Vazquez-Varela, José M. Martínez-Navarro, Luisa Abad-González

Year Published: 2022

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Book or Chapter or Journal Article

### **Quantifying production of hot firebrands using a fire-resistant fabric**

[www.nrfirescience.org/resource/22688](http://www.nrfirescience.org/resource/22688)

Identifying the number of firebrands generated during wildfires is an important aspect of understanding their propagation. A key challenge in quantifying the number of firebrands released is to distinguish those that are 'hot' and could lead to further fire spread from the total number released. Recently, a fire-resistant fabric...

Author(s): Sampath Adusumilli, Tyler R. Hudson, Nathan Gardner, David L. Blunck

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Putting people first: Using social science to reduce risk**

[www.nrfirescience.org/resource/23365](http://www.nrfirescience.org/resource/23365)

The director of West Region Wildfire Council stood before council for the Town of Mountain Village in southwest Colorado with community social data in hand. Over the course of the next hour, Lilia Falk presented key points that refuted the dominant assumption that local residents were not concerned about wildfire, nor were they...

Author(s): Patricia A. Champ, Christopher M. Barth, Hannah Brenkert-Smith, Lilia C. Falk, Jamie Gomez, James R. Meldrum

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Data-driven investigations of using social media to aid evacuations amid western United States wildfire season**

[www.nrfirescience.org/resource/24008](http://www.nrfirescience.org/resource/24008)

Wildfires have caused increasingly negative impacts with increasing occurrences close to densely populated regions. Evacuations are among the most critical measures in the immediate wildfire relief

measures. While social media have been used in natural disasters, there has been limited understanding of the efficacy of using social...

Author(s): Lingyao Li, Zihui Ma, Tao Cao

Year Published: 2021

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Book or Chapter or Journal Article

### **Native American fire management at an ancient wildland-urban interface in the Southwest United States**

[www.nrfirescience.org/resource/22621](http://www.nrfirescience.org/resource/22621)

The intersection of expanding human development and wildland landscapes—the “wildland–urban interface” or WUI—is one of the most vexing contexts for fire management because it involves complex interacting systems of people and nature. Here, we document the dynamism and stability of an ancient WUI that was apparently...

Author(s): Christopher I. Roos, Thomas W. Swetnam, T. J. Ferguson, Matthew J. Liebmann, Rachel A. Loehman, John R. Welch, Ellis Q. Margolis, Christopher H. Guiterman, William C. Hockaday, Michael J. Aiuvalasit, Jenna Battillo, Josh Farella, Christopher A. Kiahtipes

Year Published: 2021

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Book or Chapter or Journal Article

### **The changing risk and burden of wildfire in the United States**

[www.nrfirescience.org/resource/23271](http://www.nrfirescience.org/resource/23271)

Recent dramatic and deadly increases in global wildfire activity have increased attention on the causes of wildfires, their consequences, and how risk from wildfire might be mitigated. Here we bring together data on the changing risk and societal burden of wildfire in the United States. We estimate that nearly 50 million homes are...

Author(s): Marshall Burke, Anne Driscoll, Sam Heft-Neal, Jiani Xue, Jennifer Burney, Michael Wara

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **The economic reality of the forest and fuel management deficit on a fire prone western US national forest**

[www.nrfirescience.org/resource/23933](http://www.nrfirescience.org/resource/23933)

Recent extreme wildfire seasons in the United States (US) have rekindled policy debates about the underlying drivers and potential role forest management can play in reducing fuels and future wildfire. Most US western national forests face a substantial backlog of treatments and manifold management issues related to wildfire, forest...

Author(s): Pedro Belavenutti, Woodam Chung, Alan A. Ager

Year Published: 2021

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Book or Chapter or Journal Article

### **The changing risk and burden of wildfire in the United States**

[www.nrfirescience.org/resource/22574](http://www.nrfirescience.org/resource/22574)

Recent dramatic and deadly increases in global wildfire activity have increased attention on the causes of wildfires, their consequences, and how risk from wildfire might be mitigated. Here we bring together data on the changing risk and societal burden of wildfire in the United States. We estimate that nearly 50 million homes are...

Author(s): Marshall Burke, Anne Driscoll, Sam Heft-Neal, Jiani Xue, Jennifer Burney, Michael Wara

Year Published: 2021  
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Book or Chapter or Journal Article

### **Acoustical extinction of flame on moving firebrand for the fire protection in wildland-urban interface**

[www.nrfirescience.org/resource/23246](http://www.nrfirescience.org/resource/23246)

Firebrands are a widely observed phenomenon in wildland fires, which can transport for a long distance, cause spot ignition in the wildland–urban interface (WUI) and increase the rate of wildfire spread. The flame attached to a moving firebrand behaves as a potential pilot source for ignition, so extinguishing such a flame in the...

Author(s): Caiyi Xiong, Yanhui Liu, Cangsu Xu, Xinyan Huang

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Book or Chapter or Journal Article

### **A new approach to characterize firebrand showers using advanced 3D imaging techniques**

[www.nrfirescience.org/resource/23702](http://www.nrfirescience.org/resource/23702)

A new approach to characterize airborne firebrands during Wildland-Urban Interface (WUI) fires is detailed. The approach merges the following two imaging techniques in a single field-deployable diagnostic tool: (1) 3D Particle Tracking Velocimetry (3D-PTV), for time-resolved mapping of firebrand 3D trajectories, and (2) 3D Particle...

Author(s): Nicolas Bouvet, Eric Link, Stephen A. Fink

Year Published: 2021

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Book or Chapter or Journal Article

### **Would you like to know more? The effect of personalized wildfire risk information and social comparisons on information-seeking behavior in the wildland-urban interface**

[www.nrfirescience.org/resource/23121](http://www.nrfirescience.org/resource/23121)

Private landowners are important actors in landscape-level wildfire risk management. Accordingly, wildfire programs and policy encourage wildland–urban interface homeowners to engage with local organizations to properly mitigate wildfire risk on their parcels. We investigate whether parcel-level wildfire risk assessment data,...

Author(s): James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Jamie Gomez, Hilary Byerly, Lilia C. Falk, Christopher M. Barth

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Book or Chapter or Journal Article

### **The wildland fire system and challenges for engineering**

[www.nrfirescience.org/resource/23641](http://www.nrfirescience.org/resource/23641)

Recent wildland fire disasters have attracted interest from a variety of disciplines seeking to reduce impacts of fire on people and natural resources. Architecture, insurance and reinsurance, city and county government, and engineering sectors have contributed ideas to mitigate or avoid damage during wildland fires. This paper...

Author(s): Mark A. Finney

Year Published: 2021

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Book or Chapter or Journal Article

### **Risk perceptions and mitigation behaviors of residents following a near-miss wildfire**

[www.nrfirescience.org/resource/22923](http://www.nrfirescience.org/resource/22923)

Wildfires pose significant risks to populations living in the Wildland-Urban Interface (WUI). We examine the influence of WUI residents' risk perceptions as well as other cognitive constructs (guided by Protection Motivation Theory) likely to influence their decisions to take wildfire mitigation actions before and shortly after a...

Author(s): Lauren Nicole Dupey Larsen, Peter D. Howe, Mark W. Brunson, Larissa L. Yocom, Darren McAvoy, E. Helen Berry, Jordan W. Smith

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Planning for future fire: scenario analysis of an accelerated fuel reduction plan for the western United States**

[www.nrfirescience.org/resource/23634](http://www.nrfirescience.org/resource/23634)

Recent fire seasons brought a new fire reality to the western US, and motivated federal agencies to explore scenarios for augmenting current fuel management and forest restoration in areas where fires might threaten critical resources and developed areas. To support this effort, we modeled the scheduling of an accelerated forest and...

Author(s): Alan A. Ager, Cody Evers, Michelle A. Day, Fermin Alcasena-Urdiroz, Rachel M. Houtman

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Operationalising homeowner wildfire risk mitigation in fire-prone areas**

[www.nrfirescience.org/resource/22851](http://www.nrfirescience.org/resource/22851)

A significant amount of research has examined what motivates people living in fire-prone areas to mitigate their wildfire risk (i.e. engage in activities that reduce vulnerability and the effects of a wildfire on an individual's property). However, drawing overarching conclusions from this research is difficult because of the...

Author(s): Hugh D. Walpole, Sarah M. McCaffrey, Claire Rapp, Robyn S. Wilson

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Book or Chapter or Journal Article

### **Sensitivities of porous beds and plates to ignition by firebrands**

[www.nrfirescience.org/resource/23542](http://www.nrfirescience.org/resource/23542)

The increasing occurrence of severe wildfires, coupled with the expansion of the wildland urban interface has increased the number of structures in danger of being destroyed by wildfires. Ignition by firebrands is a significant avenue for fire spread and structure loss; thus, understanding processes and parameters that control the...

Author(s): Derek Bean, David L. Blunck

Year Published: 2021

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Book or Chapter or Journal Article

### **How Vulnerable Are American States to Wildfires? A Livelihood Vulnerability Assessment**

[www.nrfirescience.org/resource/23510](http://www.nrfirescience.org/resource/23510)

Quantifying livelihood vulnerability to wildland fires in the United States is challenging because of the need to systematically integrate multidimensional variables into its analysis. We aim to measure wildfire

threats amongst humans and their physical and social environment by developing a framework to calculate the livelihood...

Author(s): Janine A. Baijnath-Rodino, Mukesh Kumar, Margarita Rivera, Khoa D. Tran, Tirtha Banerjee  
Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **On the complexity of fire dynamics at the wildland-urban interface**

[www.nrfirescience.org/resource/22769](http://www.nrfirescience.org/resource/22769)

Complexity is the main feature of many fire-prone environments, in which the fire regime is driven by climate and socio-economic development on short and long timescales. In this study, the interaction between social and forest environments is modelled for the first time by assimilating socio-economic assets to a new flammable...

Author(s): Nadia Ursino

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Development and application of the fireshed registry**

[www.nrfirescience.org/resource/23374](http://www.nrfirescience.org/resource/23374)

The Fireshed Registry is an interactive geospatial data portal providing access to data describing past, present, and future trends regarding wildfire exposure to communities and forest and fuel management. The registry employs a nested spatial framework that organizes landscape variation in wildfire risk to developed areas into...

Author(s): Alan A. Ager, Michelle A. Day, Chris Ringo, Cody Evers, Fermin Alcasena-Urdiroz, Rachel M. Houtman, Michael Scanlon, Tania Ellersick

Year Published: 2021

Type: Document

Technical Report or White Paper

### **Towards understanding the effect of cedar roof covering application on firebrand production in large outdoor fires**

[www.nrfirescience.org/resource/22624](http://www.nrfirescience.org/resource/22624)

Due to the increased concern for the environment, sustainable construction materials are getting increased attention. Wood is considered a renewable, sustainable construction material. The problem with wood is that it is a fire-prone material. With an increasing number of wildland-urban interface (WUI) fires recently, it is...

Author(s): Sayaka Suzuki, Sam Manzello

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Book or Chapter or Journal Article

### **Mapping smouldering fire potential in boreal peatlands and assessing interactions with the wildland-human interface in Alberta, Canada**

[www.nrfirescience.org/resource/23360](http://www.nrfirescience.org/resource/23360)

Treed peatlands exhibit both crown and smouldering fire potential; however, neither are included in Canadian wildfire management models and, as such, they are not formally represented in management decision-making. The lack of smouldering fire risk assessment is a critical research gap as these fires can represent heavy resource...

Author(s): Sophie L. Wilkinson, A. K. Furukawa, B. Mike Wotton, James M. Waddington

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Book or Chapter or Journal Article

### **“Us versus Them;” Local Social Fragmentation and Its Potential Effects on Building Pathways to Adapting to Wildfire**

[www.nrfirescience.org/resource/23964](http://www.nrfirescience.org/resource/23964)

As the need for wildfire adaptation for human populations in the wildland-urban interface (WUI) intensifies in the face of changes that have increased the number of wildfires that exceed 100 thousand acres, it is becoming more important to come to a better understanding of social complexity on the WUI landscape. It is just as...

Author(s): Mark Billings, Matthew S. Carroll, Travis B. Paveglio, Kara Whitman

Year Published: 2021

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Book or Chapter or Journal Article

### **Understanding support for regulatory approaches to wildfire management and performance of property mitigations on private lands**

[www.nrfirescience.org/resource/22609](http://www.nrfirescience.org/resource/22609)

Formal regulation of private property and exploration of 'risk transmission' across ownerships are two popular means for addressing wildfire management at landscape scales. However, existing studies also indicate that a number of barriers exist for implementing formal regulations surrounding wildfire risk, and that few efforts gauge...

Author(s): Travis B. Paveglio, Amanda M. Stasiewicz, Catrin Edgeley

Year Published: 2021

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Book or Chapter or Journal Article

### **Development of a field deployable firebrand flux and condition measurement system**

[www.nrfirescience.org/resource/23249](http://www.nrfirescience.org/resource/23249)

A new instrument to quantify firebrand dynamics during fires with particular focus on those associated with the Wildland-Urban Interface (WUI) has been developed. During WUI fires, firebrands can ignite spot fires, which can rapidly increase the rate of spread (ROS) of the fire, provide a mechanism by which the fire can pass over...

Author(s): Simone Zen, Jan C. Thomas, Eric Mueller, Bisham Dhurandher, Michael R. Gallagher, Nick Skowronski, Rory Hadden

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Effects of changing wildfire management strategies: Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/23791](http://www.nrfirescience.org/resource/23791)

Managed wildfires, naturally ignited wildfires that are managed for resource benefit, have the potential to reduce fuel loads and minimize the effects of future wildfires, but have been utilized mainly in remote settings. A new policy federal guidance in 2009 provided greater flexibility for using this tool with the effects of the...

Author(s): Jose M. Iniguez, Andrea E. Thode, Sarah M. McCaffrey, Alexander M. Evans, Marc D. Meyer, Shaula J. Hedwall

Year Published: 2021

Type: Document

Technical Report or White Paper

### **An ecological perspective on living with fire in ponderosa pine forests of Oregon and Washington: Resistance, gone but not forgotten**

[www.nrfirescience.org/resource/23145](http://www.nrfirescience.org/resource/23145)

Wildland fires (WLF) have become more frequent, larger, and severe with greater impacts to society and ecosystems and dramatic increases in firefighting costs. Forests throughout the range of ponderosa pine in Oregon and Washington are jeopardized by the interaction of anomalously dense forest structure, a warming and drying climate...

Author(s): Andrew G. Merschel, Peter A. Beedlow, David C. Shaw, David R. Woodruff, E. Henry Lee, Steven P. Cline, Randy L. Comeleo, R. Keala Hagmann, Matthew J. Reilly

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **A methodology for experimental quantification of firebrand generation from WUI fuels**

[www.nrfirescience.org/resource/23698](http://www.nrfirescience.org/resource/23698)

Over the past few years, numerous large-scale disasters have occurred due to wildfires at the wildland-urban interface (WUI). In these fires, spread via the transport of firebrands (burning embers) plays a significant role. Several models have been developed to describe the transport of firebrands but few, if any, are available...

Author(s): Mohammadhadi Hajilou, Steven Hu, Thomas Roche, Priya Garg, Michael J. Gollner

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

### **Existing Improvements in Simulation of Fire–Wind Interaction and Its Effects on Structures**

[www.nrfirescience.org/resource/23100](http://www.nrfirescience.org/resource/23100)

This work provides a detailed overview of existing investigations into the fire–wind interaction phenomena. Specifically, it considers: the fanning effect of wind, wind direction and slope angle, and the impact of wind on fire modelling, and the relevant analysis (numerical and experimental) techniques are evaluated. Recently, the...

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

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Book or Chapter or Journal Article

### **Would you like to know more? The effect of personalized wildfire risk information and social comparisons on information-seeking behavior in the wildland-urban interface**

[www.nrfirescience.org/resource/23635](http://www.nrfirescience.org/resource/23635)

Private landowners are important actors in landscape-level wildfire risk management. Accordingly, wildfire programs and policy encourage wildland–urban interface homeowners to engage with local organizations to properly mitigate wildfire risk on their parcels. We investigate whether parcel-level wildfire risk assessment data,...

Author(s): James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Jamie Gomez, Hilary Byerly, Lilia C. Falk, Christopher M. Barth

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Book or Chapter or Journal Article

### **Multiple-Scale Relationships between Vegetation, the Wildland–Urban Interface, and Structure**

### **Loss to Wildfire in California**

[www.nrfirescience.org/resource/22884](http://www.nrfirescience.org/resource/22884)

Recent increases in destructive wildfires are driving a need for empirical research documenting factors that contribute to structure loss. Existing studies show that fire risk is complex and varies geographically, and the role of vegetation has been especially difficult to quantify. Here, we evaluated the relative importance of...

Author(s): Alexandra D. Syphard, Heather Rustigian-Romsos, Jon E. Keeley

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Book or Chapter or Journal Article

### **Predicting paradise: modeling future wildfire disasters in the western US**

[www.nrfirescience.org/resource/23537](http://www.nrfirescience.org/resource/23537)

The 2018 Camp fire destroyed the town of Paradise, California and resulted in 82 fatalities, the worst wildfire disaster in the US to date. Future disasters of similar or greater magnitude are inevitable given predicted climate change but remain highly uncertain in terms of location and timing. As with other natural disasters,...

Author(s): Alan A. Ager, Michelle A. Day, Fermin Alcasena-Urdiroz, Cody Evers, Karen C. Short, Isaac C. Grenfell

Year Published: 2021

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Book or Chapter or Journal Article

### **Ignition of Fuel Beds by Cigarettes: A Conceptual Model to Assess Fuel Bed Moisture Content and Wind Velocity Effect on the Ignition Time and Probability**

[www.nrfirescience.org/resource/23389](http://www.nrfirescience.org/resource/23389)

A conceptual model based on the balance of energy in a system composed of a burning cigarette, ambient flow and a porous fuel bed is proposed to study the burning of a single cigarette and the process of fuel bed dehydration, pyrolysis and its eventual ignition or combustion extinction. Model predictions of time to ignition and of...

Author(s): Domingos Xavier Viegas, Ricardo Oliveira, Miguel Almeida, Donghyun Kim

Year Published: 2021

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Book or Chapter or Journal Article

### **Reclassifying the wildland-urban interface using fire occurrences for the United States**

[www.nrfirescience.org/resource/21831](http://www.nrfirescience.org/resource/21831)

The wildland-urban interface (WUI) occurs at the intersection of houses and undeveloped wildlands, where fire is a safety concern for communities, motivating investment in planning, protection, and risk mitigation. Because there is no operational definition of WUI based on where fires in fact have occurred, I used fire occurrences...

Author(s): Brice B. Hanberry

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Why don't bushfire warnings work as intended? Responses to official warnings during bushfires in New South Wales, Australia**

[www.nrfirescience.org/resource/21920](http://www.nrfirescience.org/resource/21920)

Australian fire services provide two broad types of warning to people in bushfire (or wildfire) risk areas. Fire Danger Ratings communicate the possible consequences of a bushfire due to its rate of spread,

intensity and difficulty of suppression. Warnings are also issued to alert people to impending bushfires and advise them how to...

Author(s): Joshua Whittaker, Mel Taylor, Christopher Bearman

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **An examination of the social-psychological drivers of homeowner wildfire mitigation**

[www.nrfirescience.org/resource/21809](http://www.nrfirescience.org/resource/21809)

Wildfire events have been impacting many parts of the United States. Of particular importance are the Wildland-Urban Interface (WUI) areas, where residential development exposes residents to increased risk from the threat of wildfire. However, evidence shows that WUI homeowners do not adequately mitigate risk through participation...

Author(s): Benjamin Ghasemi, Gerard T. Kyle, James D. Absher

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **A multiscale model of wood pyrolysis in fire to study the roles of chemistry and heat transfer at the mesoscale**

[www.nrfirescience.org/resource/21511](http://www.nrfirescience.org/resource/21511)

Pyrolysis is a key process in all stages of wood burning from ignition to extinction. Understanding each stage is crucial to tackle wildfires and assess the fire safety of timber buildings. A model of appropriate complexity of wood pyrolysis and oxidation is missing, which limits the understanding of fires fuelled by wood. Progress...

Author(s): Franz Richter, Guillermo Rein

Year Published: 2020

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Book or Chapter or Journal Article

### **The effectiveness of adding fire for air quality benefits challenged: A case study of increased fine particulate matter from wilderness fire smoke with more active fire management**

[www.nrfirescience.org/resource/20792](http://www.nrfirescience.org/resource/20792)

The Lion Fire 2011 (LF11) and Lion Fire 2017 (LF17) were similar in size, location, and smoke transport. The same locations were used to monitor both fires for ground level fine particulate matter (PM<sub>2.5</sub>). Ground level PM<sub>2.5</sub> is used to determine the relative smoke exposure from fire management tactics used during LF11 and LF17. The...

Author(s): Don Schweizer, Ricardo Cisneros, Kathleen M. Navarro

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Object-based post-fire aerial image classification for building damage, destruction and defensive actions at the 2012 Colorado Waldo Canyon Fire**

[www.nrfirescience.org/resource/20778](http://www.nrfirescience.org/resource/20778)

We compare the use of post-fire aerial imagery to ground-based assessment for identifying building destruction and damage at the 2012 Colorado Waldo Canyon Fire. We also compare active-fire defensive actions identified via manual and automated post-fire image classification to defensive actions documented from ground-based...

Author(s): Derek McNamara, William E. Mell, Alexander Maranghides

Year Published: 2020

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Book or Chapter or Journal Article

### **Building Loss in WUI Disasters: Evaluating the Core Components of the Wildland–Urban Interface Definition**

[www.nrfirescience.org/resource/22399](http://www.nrfirescience.org/resource/22399)

Accurate maps of the wildland-urban interface (WUI) are critical for the development of effective land management policies, conducting risk assessments, and the mitigation of wildfire risk. Most WUI maps identify areas at risk from wildfire by overlaying coarse-scale housing data with land cover or vegetation data. However, it is...

Author(s): Michael D. Caggiano, Todd J. Hawbaker, Benjamin Gannon, Chad M. Hoffman

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Book or Chapter or Journal Article

### **Fire Adapted Community**

[www.nrfirescience.org/resource/21360](http://www.nrfirescience.org/resource/21360)

This document is a chapter within the Encyclopedia of Wildfires and Wildland-Urban Interface (WUI) Fires Living Edition. A fire adapted community (FAC) is comprised of residents, land management professionals, local politicians, emergency managers, and fire professionals who collaborate effectively to plan for, respond to, and...

Author(s): Travis B. Paveglio, Catrin Edgeley

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Book or Chapter or Journal Article

### **Role of firebrand combustion in large outdoor fire spread**

[www.nrfirescience.org/resource/20709](http://www.nrfirescience.org/resource/20709)

Large outdoor fires are an increasing danger to the built environment. Wildfires that spread into communities, labeled as Wildland-Urban Interface (WUI) fires, are an example of large outdoor fires. Other examples of large outdoor fires are urban fires including those that may occur after earthquakes as well as in informal...

Author(s): Sam Manzello, Sayaka Suzuki, Michael J. Gollner, A. Carlos Fernandez-Pello

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Evaluating the 10% wind speed rule of thumb for estimating a wildfire's forward rate of spread against an extensive independent set of observations**

[www.nrfirescience.org/resource/22285](http://www.nrfirescience.org/resource/22285)

The prediction of wildfire rate of spread and growth under high wind speeds and dry fuel moisture conditions is key to taking proactive actions to warn and in turn protect communities. We used two datasets of wildfires spreading under critical fire weather conditions to evaluate an existing rule of thumb that equates the forward...

Author(s): Miguel G. Cruz, Martin E. Alexander, Paulo M. Fernandes, Musa Kilinc, Ângelo Sil

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Forging, protecting, and repairing community resilience informed by the 2019-2020 Australian**

## **bushfires**

[www.nrfirescience.org/resource/21172](http://www.nrfirescience.org/resource/21172)

Natural disasters are inherently traumatic. The unexpected, unpredictable, threatening, and overwhelming nature of these events can be destabilising and distressing, potentially leading to psychological trauma (Substance Abuse & Mental Health Services Administration, 2014). Psychological trauma encompasses how people respond to...

Author(s): Sancia West, Denis C. Visentin, Amanda Neil, Grad Dip, Rachel Kornhaber, Valerie Ingham, Michelle Cleary

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Measurement of firebrands generated during fires in pine-dominated ecosystems in relation to fire behavior and intensity**

[www.nrfirescience.org/resource/22236](http://www.nrfirescience.org/resource/22236)

Firebrands are a leading cause of ignition at the wildland urban interface and a driver of rapid fire spread during wildfires. Current studies which seek to evaluate this risk are limited by a paucity of data relating to the firebrand dynamics from real fires. In particular the deposition of firebrands as a function of time and space...

Author(s): Rory Hadden

Year Published: 2020

Type: Document

Technical Report or White Paper

## **Where to prescribe burn: the costs and benefits of prescribed burning close to houses**

[www.nrfirescience.org/resource/21068](http://www.nrfirescience.org/resource/21068)

Prescribed burning is used in Australia as a tool to manage fire risk and protect assets. A key challenge is deciding how to arrange the burns to generate the highest benefits to society. Studies have shown that prescribed burning in the wildland–urban interface (WUI) can reduce the risk of house loss due to wildfires, but the...

Author(s): Veronique Florec, Michael P. Burton, David J. Pannell, Joel K. Kelso, George J. Milne

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Role of accumulation for ignition of fuel beds by firebrands**

[www.nrfirescience.org/resource/22174](http://www.nrfirescience.org/resource/22174)

Large outdoor fires are one of the prominent fire problems in the world. Spot fires, caused by firebrands, are known as a key mechanism of rapid fire spread. Firebrands ignite unburned fuels far ahead of the fire front. In large outdoor fires, firebrands are thought to accumulate and ignite unburned fuel which cannot be ignited by a...

Author(s): Sayaka Suzuki, Sam Manzello

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Working in Smoke:: Wildfire Impacts on the Health of Firefighters and Outdoor Workers and Mitigation Strategies**

[www.nrfirescience.org/resource/24570](http://www.nrfirescience.org/resource/24570)

Key points -Wildland firefighters do not wear respiratory protection while working long hours and can be exposed to elevated concentrations of smoke. -There is very limited research on long-term health of

wildland firefighters from smoke exposure across an entire career. -New emergency regulations have been enacted in California...

Author(s): Kathleen M. Navarro

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Resistance and Representation in a Wildland–Urban Interface Fuels Treatment Conflict: The Case of the Forsythe II Project in the Arapaho-Roosevelt National Forest**

[www.nrfirescience.org/resource/21881](http://www.nrfirescience.org/resource/21881)

Land treatments in wildland-urban interface (WUI) areas are highly visible and subject to public scrutiny and possible opposition. This study examines a contested vegetation treatment-Forsythe II-in a WUI area of the Arapaho-Roosevelt National Forest in Colorado. An initial phase of the research found vocal opposition to Forsythe II...

Author(s): Hannah Brenkert-Smith, Jody L. Jahn, Eric A. Vance, Juan Ahumada

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **If you love it, let it go: the role of home attachment in wildfire evacuation decisions**

[www.nrfirescience.org/resource/20985](http://www.nrfirescience.org/resource/20985)

Evacuation is the preferred method in the U.S. for preserving public safety in wildfire. However, alternatives such as staying and defending are used both in North America and Australia. Dangerous delays in the decision to evacuate are also common. One contributor to the evacuation decision is attachment to the home, however, little...

Author(s): Hugh D. Walpole, Robyn S. Wilson, Sarah M. McCaffrey

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Classifying large wildfires in the United States by land cover**

[www.nrfirescience.org/resource/22065](http://www.nrfirescience.org/resource/22065)

Fire is an ecological process that also has socio-economic effects. To learn more about fire occurrence, I examined relationships between land classes and about 12,000 spatially delineated large wildfires (defined here as uncontrolled fires  $\geq 200$  ha, although definitions vary) during 1999 to 2017 in the conterminous United States....

Author(s): Brice B. Hanberry

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

**Resistance and representation in a wildland-urban interface fuels treatment conflict: the case of the Forsythe II project in the Arapaho-Roosevelt National Forest**

[www.nrfirescience.org/resource/20938](http://www.nrfirescience.org/resource/20938)

Land treatments in wildland-urban interface (WUI) areas are highly visible and subject to public scrutiny and possible opposition. This study examines a contested vegetation treatment-Forsythe II-in a WUI area of the Arapaho-Roosevelt National Forest in Colorado. An initial phase of the research found vocal opposition to Forsythe II...

Author(s): Hannah Brenkert-Smith, Jody L. Jahn, Eric A. Vance, Juan Ahumada

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

**In the Line of Fire: Consequences of Human-Ignited Wildfires to Homes in the U.S. (1992–2015)**

[www.nrfirescience.org/resource/21949](http://www.nrfirescience.org/resource/21949)

With climate-driven increases in wildfires in the western U.S., it is imperative to understand how the risk to homes is also changing nationwide. Here, we quantify the number of homes threatened, suppression costs, and ignition sources for 1.6 million wildfires in the United States (U.S.; 1992-2015). Human-caused wildfires accounted...

Author(s): Nathan Mietkiewicz, Jennifer Balch, Tania L. Schoennagel, Stefan Leyk, Lise A. St. Denis, Bethany A. Bradley

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

**Risk interdependency, social norms, and wildfire mitigation: a choice experiment**

[www.nrfirescience.org/resource/21815](http://www.nrfirescience.org/resource/21815)

Wildfire presents a growing threat across the American West. We conducted an online choice experiment in Western Colorado to assess how social interactions affect wildfire mitigation decisions through two distinct pathways: risk interdependency (neighbors' conditions affect perceived wildfire risk) and social norms (neighbors'...

Author(s): Katherine L. Dickinson, Hannah Brenkert-Smith, Greg Madonia, Nicholas Flores

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

**Managing fire risk at the wildland-urban interface requires reconciliation of tradeoffs between regulating and cultural ecosystem services**

[www.nrfirescience.org/resource/21796](http://www.nrfirescience.org/resource/21796)

Forest fires at the wildland-urban interface are generating increasing losses due to the expansion of cities into adjacent forests. At the same time, urban green open spaces are highly valuable as sources of recreational, educational and aesthetic benefits. Tradeoffs may arise between the desire to preserve peri-urban forests for...

Author(s): Yaella Depietri, Daniel E. Orenstein

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

**Resistance and Representation in a Wildland–Urban Interface Fuels Treatment Conflict: The**

### **Case of the Forsythe II Project in the Arapaho-Roosevelt National Forest**

[www.nrfirescience.org/resource/20801](http://www.nrfirescience.org/resource/20801)

Land treatments in wildland-urban interface (WUI) areas are highly visible and subject to public scrutiny and possible opposition. This study examines a contested vegetation treatment-Forsythe II-in a WUI area of the Arapaho-Roosevelt National Forest in Colorado. An initial phase of the research found vocal opposition to Forsythe II...

Author(s): Hannah Brenkert-Smith, Jody L. Jahn, Eric A. Vance, Juan Ahumada

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Compounded heat and fire risk for future U.S. populations**

[www.nrfirescience.org/resource/21442](http://www.nrfirescience.org/resource/21442)

Climate change is increasing the risk of extreme events, resulting in social and economic challenges. I examined recent past (1971–2000), current and near future (2010-2039), and future (2040-2069) fire and heat hazard combined with population growth by different regions and residential densities (i.e., exurban low and high...

Author(s): Brice B. Hanberry

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Identifying opportunities for the use of broadcast prescribed fire on Colorado's Front Range**

[www.nrfirescience.org/resource/20791](http://www.nrfirescience.org/resource/20791)

Increasing the pace and scale of fuel treatments to protect social and ecological values from severe wildfire is a major initiative of numerous land management agencies, organizations, and collaborative groups throughout the western United States, including the Colorado Front Range. Broadcast prescribed fire is a relatively low-cost...

Author(s): Rob Addington, Brian G. Tavernia, Michael D. Caggiano, Matthew P. Thompson, Jason D. Lawhon, John S. Sanderson

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Fire behavior in multiple burning shrubs separated horizontally and vertically**

[www.nrfirescience.org/resource/22468](http://www.nrfirescience.org/resource/22468)

Fire interactions between multiple 1 m tall, 0.7 m diameter chamise shrubs was studied utilizing the Wildland-Urban Interface Fire Dynamics Simulator (WFDS, Mell et al., 2009). Two shrub arrangements were investigated. First, nine shrubs were placed in a 3x3 horizontal region. The shrub separation distance and wind speed were varied...

Author(s): William Shannon, Chandana Anand, Babak Shotorban, Shankar M. Mahalingam

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Finding common ground: agreement on increasing wildfire risk crosses political lines**

[www.nrfirescience.org/resource/21438](http://www.nrfirescience.org/resource/21438)

Wildfire is a growing threat in the western US, driven by high fuel loads, a warming climate, and rising human activity in the wildland urban interface. Diverse stakeholders must collaborate to mitigate risk and adapt to changing conditions. Communication strategies in collaborative efforts may be most effective if they align with...

Author(s): Joel Hartter, Lawrence C. Hamilton, Mark J. Ducey, Angela Boag, Jonathan D. Salerno, Nils D. Christoffersen, Paul T. Oester, Michael W. Palace, Forrest R. Stevens  
Year Published: 2020  
Type: Document  
Book or Chapter or Journal Article

### **LiDAR technology to map forest continuity: A municipality tool to prevent forest fires in a Wildland–Urban interface**

[www.nrfirescience.org/resource/20740](http://www.nrfirescience.org/resource/20740)

Highlights: • LiDAR technology is a municipality tool to map forest continuity in a wildland–urban interface. • Mapping forest continuity of urban parcels permits prioritisation of intervention efforts to prevent forest fires. • Moran's I permits determination of spatial autocorrelation of the Canopy Fraction Cover of...

Author(s): Anna Badia, Meritxell Gisbert  
Year Published: 2020  
Type: Document  
Book or Chapter or Journal Article

### **The mitigated neighborhood: exploring homeowner associations' role in resident wildfire-mitigation actions**

[www.nrfirescience.org/resource/22326](http://www.nrfirescience.org/resource/22326)

Considerable research has explored homeowner wildfire-mitigation efforts identifying many salient factors that help predict acceptance and behaviors. A growing body of literature is unlocking the dynamics of formal associations' roles in promoting fire adapted communities. This mixed-method study adds to the research by using a...

Author(s): Eric Steffey, Megha Budruk, Christine A. Vogt  
Year Published: 2020  
Type: Document  
Book or Chapter or Journal Article

### **Garnering understanding into complex firebrand generation processes from large outdoor fires using simplistic laboratory-scale experimental methodologies**

[www.nrfirescience.org/resource/21300](http://www.nrfirescience.org/resource/21300)

A simple laboratory-scale experimental method was developed to study firebrand generation processes. As part of these experiments, Japanese wind facilities were used to elucidate the effect of wind speed on firebrand generation from structural materials. It was found that very simple experimental methodologies developed as part of...

Author(s): Sayaka Suzuki, Sam Manzello  
Year Published: 2020  
Type: Document  
Book or Chapter or Journal Article

### **Resistance and Representation in a Wildland–Urban Interface Fuels Treatment Conflict: The Case of the Forsythe II Project in the Arapaho-Roosevelt National Forest**

[www.nrfirescience.org/resource/20675](http://www.nrfirescience.org/resource/20675)

Land treatments in wildland-urban interface (WUI) areas are highly visible and subject to public scrutiny and possible opposition. This study examines a contested vegetation treatment-Forsythe II-in a WUI area of the Arapaho-Roosevelt National Forest in Colorado. An initial phase of the research found vocal opposition to Forsythe II...

Author(s): Hannah Brenkert-Smith, Jody L. Jahn, Eric A. Vance, Juan Ahumada  
Year Published: 2020

Type: Document  
Book or Chapter or Journal Article

### **Developing Behavioral and Evidence-Based Programs for Wildfire Risk Mitigation**

[www.nrfirescience.org/resource/22260](http://www.nrfirescience.org/resource/22260)

The actions of residents in the wildland–urban interface can influence the private and social costs of wildfire. Wildfire programs that encourage residents to take action are often delivered without evidence of effects on behavior. Research from the field of behavioral science shows that simple, often low-cost changes to program...

Author(s): Hilary Byerly, James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Jamie Gomez, Lilia C. Falk, Christopher M. Barth

Year Published: 2020

Type: Document  
Book or Chapter or Journal Article

### **An integrated approach to identify low-flammability plant species for green firebreaks**

[www.nrfirescience.org/resource/21144](http://www.nrfirescience.org/resource/21144)

With recent and predicted increases in the frequency and intensity of wildfires, there is a pressing need for mitigation strategies to reduce the impacts of wildfires on human lives, infrastructure and biodiversity. One strategy involves the use of low-flammability plants to build green firebreaks at the wildland–urban interface....

Author(s): Brad R. Murray, Colin Brown, Megan L. Murray, Daniel W. Krix, Leigh J. Martin, Thomas Hawthorne, Molly I. Wallace, Summer A. Potvin, Jonathan K. Webb

Year Published: 2020

Type: Document  
Book or Chapter or Journal Article

### **Effects of fuel morphology on ember generation characteristics at the tree scale**

[www.nrfirescience.org/resource/22233](http://www.nrfirescience.org/resource/22233)

This work reports characteristics of embers generated by torching trees and seeks to identify the important physical and biological factors involved. The size of embers, number flux and propensity to ignite spot fires (i.e. number flux of ‘hot’ embers) are reported for several tree species under different combinations of number...

Author(s): Tyler R. Hudson, Ryan B. Bray, David L. Blunck, Wesley G. Page, Bret W. Butler

Year Published: 2020

Type: Document  
Book or Chapter or Journal Article

### **Wildfire recovery as a “hot moment” for creating fire-adapted communities**

[www.nrfirescience.org/resource/21002](http://www.nrfirescience.org/resource/21002)

Recent decades have witnessed an escalation in the social, economic, and ecological impacts of wildfires worldwide. Wildfire losses stem from the complex interplay of social and ecological forces at multiple scales, including global climate change, regional wildfire regimes altered by human activities, and locally managed wildland-...

Author(s): Ronald L. Schumann, Miranda H. Mockrin, Alexandra D. Syphard, Joshua Whittaker, Owen F. Price, Cassandra Johnson-Gaither, Christopher T. Emrich, Van Butsic

Year Published: 2020

Type: Document  
Book or Chapter or Journal Article

### **Awareness and adoption of FireSmart Canada: barriers and incentives**

[www.nrfirescience.org/resource/22133](http://www.nrfirescience.org/resource/22133)

Homeowners in the Wildland Urban Interface (WUI) are strongly encouraged to protect their property from the risk of damage from forest fires. FireSmart Canada, similar to Firewise used in the United States, and Community Fireguard, Community FireWise, Community FireSafe and the Bushfire Ready Action Groups in Australia, provides...

Author(s): Mohamed Ergibi, Hayley Hesseln

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Guidance on Design and Construction of the Built Environment Against Wildland Urban Interface Fire Hazard: A Review**

[www.nrfirescience.org/resource/21840](http://www.nrfirescience.org/resource/21840)

Wildland-Urban Interface (WUI) fires, a worldwide problem, are gaining more importance over time due to climate change and increased urbanization in WUI areas. Some jurisdictions have provided standards, codes and guidelines, which may greatly help planning, prevention and protection against wildfires. This work presents a wide...

Author(s): Paolo Intini, Enrico Ronchi, Steven M. V. Gwynne, Nouredine Bénichou

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Fire deficit increases wildfire risk for many communities in the Canadian boreal forest**

[www.nrfirescience.org/resource/22832](http://www.nrfirescience.org/resource/22832)

The top priority of fire management agencies in Canada is to protect human life and property. Here we investigate if decades of aggressive fire suppression in the boreal biome of Canada has reduced the proportion of recently burned forests (RBF; <30 years) near human communities, and thereby inadvertently increased the risk of...

Author(s): Marc-Andre Parisien, Quinn E. Barber, Kelvin G. Hirsch, Christopher A. Stockdale, Sandy Erni, Xianli Wang, Dominique Arseneault, Sean A. Parks

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Reducing wooden structure and wildland-urban interface fire disaster risk through dynamic risk assessment and management**

[www.nrfirescience.org/resource/20965](http://www.nrfirescience.org/resource/20965)

In recent years, severe and deadly wildland-urban interface (WUI) fires have resulted in an increased focus on this particular risk to humans and property, especially in Canada, USA, Australia, and countries in the Mediterranean area. Also, in areas not previously accustomed to wildfires, such as boreal areas in Sweden, Norway, and...

Author(s): Torgrim Log, Vigdis Vandvik, Liv G. Velle, Maria-Monika Metallinou

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **A review of post-incident studies for wildland-urban interface fires**

[www.nrfirescience.org/resource/21973](http://www.nrfirescience.org/resource/21973)

Post-incident studies provide direct and valuable information to further the scientific understanding of Wildland-Urban Interface (WUI) fires. Most post-incident studies involve data collection in the field (i.e.

a 'research field deployment'). In this review, technical reports of post-incident studies for WUI fire and other natural...

Author(s): Benjamin Gaudet, Albert Simeoni, Steven M. V. Gwynne, Erica D. Kuligowski, Noureddine Bénichou

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Thermal characterization of firebrand piles**

[www.nrfirescience.org/resource/19225](http://www.nrfirescience.org/resource/19225)

The cause of the majority of structure losses in wildland-urban interface fires is ignition via firebrands, small pieces of burning material generated from burning vegetation and structures. To understand the mechanism of these losses, small-scale experiments designed to capture heating from firebrand piles and to describe the...

Author(s): Raquel S. P. Hakes, Hamed Salehizadeh, Matthew J. Weston-Dawkes, Michael J. Gollner

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Wildfire Smoke: A Guide for Public Health Officials**

[www.nrfirescience.org/resource/20882](http://www.nrfirescience.org/resource/20882)

The guide provides public health officials with the information they need to prepare for smoke events, communicate health risks and take measures to protect public health. It is also a valuable resource for anyone interested in learning more about what to do when smoke travels from nearby forest fires. This fourth edition of the...

Author(s): Susan Lyon Stone

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Wildfire exposure to the wildland urban interface in the western US**

[www.nrfirescience.org/resource/20189](http://www.nrfirescience.org/resource/20189)

Predicting wildfire disasters presents a major challenge to the field of risk science, especially when fires propagate long distances through diverse fuel types and complex terrain. A good example is in the western US where large tracts of public lands routinely experience large fires that spread from remote wildlands into developed...

Author(s): Alan A. Ager, Palaiologos Palaiologou, Cody Evers, Michelle A. Day, Chris Ringo, Karen C. Short

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **A provisional conceptual model of human behavior in response to wildland-urban interface fires**

[www.nrfirescience.org/resource/19146](http://www.nrfirescience.org/resource/19146)

With more frequent and destructive wildfires occurring in the growing wildland-urban interface (WUI), the ability to ensure the safe evacuation of potentially large groups of people is of increasing importance. This is a challenging task made only more difficult by the fact that there is often little warning and that evacuations...

Author(s): Lauren H. Folk, Erica D. Kuligowski, Steven M. V. Gwynne, John A. Gales

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Roadside vegetation planning and conservation: new approach to prevent and mitigate wildfires based on fire ignition potential**

[www.nrfirescience.org/resource/19906](http://www.nrfirescience.org/resource/19906)

Wildfires in urban landscapes spreading into forested landscapes are a growing problem due to socioeconomic and climate changes. Fire ignition and flame spread depend on meteorological and environmental conditions and the physicochemical traits of the fuel. In this approach, environmental variables and geostatistical techniques (...)

Author(s): Juan Ramón Molina Martínez, Ángel Lora, Cristina Prades, Francisco Rodriguez y Silva

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **A Socio-Ecological Approach to Mitigating Wildfire Vulnerability in the Wildland Urban Interface: A Case Study from the 2017 Thomas Fire**

[www.nrfirescience.org/resource/19058](http://www.nrfirescience.org/resource/19058)

Wildfire disasters are one of the many consequences of increasing wildfire activities globally, and much effort has been made to identify strategies and actions for reducing human vulnerability to wildfire. While many individual homeowners and communities have enacted such strategies, the number subjected to a subsequent wildfire is...

Author(s): Crystal A. Kolden, Carol Henson

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Fire regime and ecosystem responses: adaptive forest management in a changing world (Part 2)**

[www.nrfirescience.org/resource/19869](http://www.nrfirescience.org/resource/19869)

Fire is an ecological factor in ecosystems around the world, made increasingly more critical by unprecedented shifts in climate and human population pressure. The knowledge gradually acquired on the subject is needed to improve fire behaviour understanding and to enhance fire management decision-making. This issue (Volume 28, issue...

Author(s): Daniel Moya, Giacomo Certini, Peter Z. Fule

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Modelling the fire propagation from the fuel bed to the lower canopy of ornamental species used in wildland–urban interfaces**

[www.nrfirescience.org/resource/18999](http://www.nrfirescience.org/resource/18999)

South-eastern France is strongly affected by wildfires mostly occurring in the wildland–urban interfaces (WUIs). A WUI fire is often initiated in dead surface fuel, then can propagate to shrubs and trees when the lower canopy is close to (or touches) the ground. Whereas a previous study assessed the fire propagation from the fuel...

Author(s): L. Terrei, Aymeric Lamorlette, Anne Ganteaume

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Improving the uncertainty assessment of economic losses from large destructive wildfires**

[www.nrfirescience.org/resource/19721](http://www.nrfirescience.org/resource/19721)

Currently, as fire risk is considered a high-frequency and low-severity risk, actuarial and underwriting pricing and risk management methods have stuck to methods based purely on historical loss data. In the global context of both increasing fire severity with climate change and increasing wildland–urban interface area, the use of...

Author(s): Bruno Guillaume, Bernard Porterie, Antonio Carlos Batista, Phil Cottle, Armand Albergel

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Cross-boundary wildfire and community exposure: A framework and application in the western U.S.**

[www.nrfirescience.org/resource/19663](http://www.nrfirescience.org/resource/19663)

In this report we provide a framework for assessing cross-boundary wildfire exposure and a case study application in the western U.S. The case study provides detailed mapping and tabular decision support materials for prioritizing fuel management investments aimed at reducing wildfire exposure to communities located proximal to...

Author(s): Alan A. Ager, Michelle A. Day, Palaiologos Palaiologou, Rachel M. Houtman, Chris Ringo, Cody Evers

Year Published: 2019

Type: Document

Technical Report or White Paper

### **A spatial optimization model for resource allocation for wildfire suppression and resident evacuation**

[www.nrfirescience.org/resource/20619](http://www.nrfirescience.org/resource/20619)

Wildland-urban interface wildfires have been a significant threat in many countries. This paper presents an integer two-stage stochastic goal programming model for comprehensive, efficient response to a wildfire including firefighting resource allocation and resident evacuation. In contrast to other natural disasters, the...

Author(s): Siqiong Zhou, Ayca Erdogan

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Exploring the influence of local social context on strategies for achieving Fire Adapted Communities**

[www.nrfirescience.org/resource/19645](http://www.nrfirescience.org/resource/19645)

There is a growing recognition that the social diversity of communities at risk from wildland fire may necessitate divergent combinations of policies, programs and incentives that allow diverse populations to promote fire adapted communities (FACs). However, there have been few coordinated research efforts to explore the perceived...

Author(s): Travis B. Paveglio, Catrin Edgeley, Matthew S. Carroll, Mark Billings, Amanda M. Stasiewicz

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Forest fire induced Natech risk assessment: a survey of geospatial technologies**

[www.nrfirescience.org/resource/20469](http://www.nrfirescience.org/resource/20469)

Forest fires threaten a large part of the world's forests, communities, and industrial plants, triggering technological accidents (Natechs). Forest fire modelling with respect to contributing spatial parameters

is one of the well-known ways not only to predict the fire occurrence in forests, but also to assess the risk of forest-...

Author(s): Mohsen Naderpour, Hossein Mojaddadi Rizeei, Nima Khakzad, Biswajeet Pradhan

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Relationships among leaf flammability attributes and identifying low-leaf-flammability species at the wildland-urban interface**

[www.nrfirescience.org/resource/19442](http://www.nrfirescience.org/resource/19442)

Leaf flammability is a multidimensional plant functional trait with emerging importance for wildfire risk management. Understanding relationships among leaf flammability attributes not only provides information about the properties of leaves as fuels in the wildland–urban interface (WUI), it can also offer an effective way to...

Author(s): Daniel W. Krix, Megan L. Phillips, Brad R. Murray

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Exploring wildfire-prone community trust in wildfire management agencies**

[www.nrfirescience.org/resource/20299](http://www.nrfirescience.org/resource/20299)

This research examines how trustworthy wildfire management agencies are perceived to be in five wildfire-prone communities. Trust was most often expressed in the context of agency abilities or competence (calculative trust), whereas distrust was framed in the context of intentions or the belief that the agency is not acting in the...

Author(s): Rebecca Rasch, Sarah M. McCaffrey

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Local community agency and vulnerability influences on a Montana wildfire**

[www.nrfirescience.org/resource/19328](http://www.nrfirescience.org/resource/19328)

This case study explores the social dynamics surrounding a destructive wildfire in central Montana. We examine the settlement patterns and events that respondents felt helped create high social vulnerability among a significant portion of local residents in the study area and the way that vulnerability led to impacts from the fire....

Author(s): Matthew S. Carroll, Travis B. Paveglio

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Defining “Resilient Landscapes” From Multiple Stakeholder Perspectives in a Wildland Urban Interface (WUI) Area - Final Report for JFSP**

[www.nrfirescience.org/resource/20249](http://www.nrfirescience.org/resource/20249)

Fuel treatment projects in wildland urban interface (WUI) areas are highly visible to public scrutiny, which can lead to intractable conflicts between land managers and the public that could block the implementation of those treatments. If agencies and publics are not able to reach adequate consensus regarding the definition of “...

Author(s): Jody L. Jahn, Hannah Brenkert-Smith

Year Published: 2019

Type: Document

### **Investigating effect of wind speeds on structural firebrand generation in laboratory scale experiments**

[www.nrfirescience.org/resource/19208](http://www.nrfirescience.org/resource/19208)

Firebrands generated from structures are known to be a source of rapid flame spread within communities in large outdoor fires, such as wildland-urban (WUI) fires, and urban fires. It is important to better understand firebrand generation mechanism to prevent structure ignitions by firebrands. Though the wind plays an important role...

Author(s): Sayaka Suzuki, Sam Manzello

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Fire Ember Production from Wildland and Structural Fuels - JFSP Final Report**

[www.nrfirescience.org/resource/20109](http://www.nrfirescience.org/resource/20109)

Direct flame contact, radiant heat, and burning firebrands (or embers) have been identified as three principal ways that cause fire spread in the wildland and Wildland-Urban Interface (WUI). However, only burning firebrands can initiate a new spot fire at distances further than 60-m away from the main fire front. During extreme...

Author(s): Aixi Zhou, Steve Quarles, David R. Weise

Year Published: 2019

Type: Document

Technical Report or White Paper

### **Archetypes of community wildfire exposure from national forests of the western US**

[www.nrfirescience.org/resource/19098](http://www.nrfirescience.org/resource/19098)

Risk management typologies and their resulting archetypes can structure the many social and biophysical drivers of community wildfire risk into a set number of strategies to build community resilience. Existing typologies omit key factors that determine the scale and mechanism by which exposure from large wildfires occur. These...

Author(s): Cody Evers, Alan A. Ager, Max W. Nielsen-Pincus, Palaiologos Palaiologou, Ken Bunzel

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Exploring influences on intended evacuation behaviors during wildfire: what roles for pre-fire actions and event-based cues?**

[www.nrfirescience.org/resource/19902](http://www.nrfirescience.org/resource/19902)

Fire management professionals across multiple countries advocate evacuation as the safest action residents can take when threatened by a wildfire. However, existing research notes that while some residents may opt to evacuate to a safer place, others may choose alternatives to evacuation, including staying and actively defending...

Author(s): Catrin Edgeley, Travis B. Paveglio

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Tradeoffs between US national forest harvest targets and fuel management to reduce wildfire transmission to the wildland urban interface**

[www.nrfirescience.org/resource/19031](http://www.nrfirescience.org/resource/19031)

US public land management agencies are faced with multiple, often conflicting objectives to meet management targets and produce a wide range of ecosystem services expected from public lands. One example is managing the growing wildfire risk to human and ecological values while meeting programmatic harvest targets for economic...

Author(s): Alan A. Ager, Rachel M. Houtman, Michelle A. Day, Chris Ringo, Palaiologos Palaiologou

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Estimating fire smoke related health burden and novel tools to manage impacts on urban populations - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/19727](http://www.nrfirescience.org/resource/19727)

Fire smoke is a major contributor to both particulate matter (PM) and ozone exposure in urban centers. Epidemiological, clinical, and toxicological studies have demonstrated a casual relationship between these pollutants and cardiovascular and respiratory related deaths and illnesses. Given the expected increase in fire events due...

Author(s): Brian J. Reich, Ana G. Rappold, Fay H. Johnston, Geoffrey G. Morgan, Neal L. Fann, Martin E. Cope, Richard A. Broome

Year Published: 2019

Type: Document

Technical Report or White Paper

### **Modelling of the Radiant Heat Flux and Rate of Spread of Wildfire within the Urban Environment**

[www.nrfirescience.org/resource/18806](http://www.nrfirescience.org/resource/18806)

One approach to increase community resilience to wildfire impacts is the enhancement of residential construction standards in an effort to provide protective shelters for families within their own homes. Current wildfire models reviewed in this study assume fire growth is unrestricted by vegetation fuel bed geometry; the head fire...

Author(s): Greg Penney, Steven Richardson

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Long-Term Impacts of Fuel Treatment Placement with Respect to Forest Cover Type on Potential Fire Behavior across a Mountainous Landscape**

[www.nrfirescience.org/resource/19659](http://www.nrfirescience.org/resource/19659)

Research Highlights: The impact of variation in fuels and fuel dynamics among forest cover types on the outcome of fuel treatments is poorly understood. This study investigated the potential effects of treatment placement with respect to cover type on the development of potential fire behavior over time for 48 km<sup>2</sup> of forest in...

Author(s): Seth A. Ex, Justin P. Ziegler, Wade T. Tinkham, Chad M. Hoffman

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **To insure or not to insure? Factors affecting acquisition of prescribed burning insurance coverage**

[www.nrfirescience.org/resource/20471](http://www.nrfirescience.org/resource/20471)

Prescribed burning is a widely used tool in forest and grassland management. However, because fire that escapes from a prescribed burn accidentally may cause property damage, injuries, and even

human casualties, purchasing insurance to cover such damages may be beneficial for prescribed burn practitioners. Given that insurance...

Author(s): Rajan Parajuli, Omkar Joshi, Neelam C. Poudyal, Urs P. Kreuter

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Modeling and mapping dynamic vulnerability to better assess WUI evacuation performance**

[www.nrfirescience.org/resource/20308](http://www.nrfirescience.org/resource/20308)

Wildland-urban interface (WUI) fire incidents are likely to become more severe and will affect more and more people. Given their scale and complexity, WUI incidents require a multidomain approach to assess their impact and the effectiveness of any mitigation efforts. The authors recently produced a specification for a simulation...

Author(s): Steven M. V. Gwynne, Enrico Ronchi, Noureddine Bénichou, Max Kinateter, Erica D. Kuligowski, Islam Gomaa, Masoud Adelzadeh

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Modeling individual and group evacuation decisions during wildfires**

[www.nrfirescience.org/resource/19371](http://www.nrfirescience.org/resource/19371)

Quantifying factors that affect evacuation decision making remains a challenging task. Progress is crucial for developing predictive models of collective behavior and for designing effective policies to guide the action of populations during wildfires. We conduct a controlled behavioral experiment to probe factors influencing...

Author(s): Chantal Nguyen, Kimberly J. Schlesinger, Fangqiu Han, Izzeddin Gür, Jean M. Carlson

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **An open multi-physics framework for modelling wildland-urban interface fire evacuations**

[www.nrfirescience.org/resource/20297](http://www.nrfirescience.org/resource/20297)

Fire evacuations at wildland-urban interfaces (WUI) pose a serious challenge to the emergency services, and are a global issue affecting thousands of communities around the world. This paper presents a multi-physics framework for the simulation of evacuation in WUI wildfire incidents, including three main modelling layers: wildfire...

Author(s): Enrico Ronchi, Steven M. V. Gwynne, Guillermo Rein, Paolo Intini, Rahul Wadhvani

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Scalable evacuation routing in a dynamic environment**

[www.nrfirescience.org/resource/17242](http://www.nrfirescience.org/resource/17242)

In emergency management, tools are needed so we can take the appropriate action at different stages of an evacuation. Recent wildfires in California showed how quickly a natural disaster can affect a large geographical area. Natural disasters can create unpredicted traffic congestion or can temporarily block urban or rural roads....

Author(s): Kaveh Shahabi, John P. Wilson

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Selecting low-flammability plants as green firebreaks within sustainable urban garden design**

[www.nrfirescience.org/resource/17770](http://www.nrfirescience.org/resource/17770)

In response to an increasing risk of property loss from wildfires at the urban–wildland interface, there has been growing interest around the world in the plant characteristics of urban gardens that can be manipulated to minimize the chances of property damage or destruction. To date, considerable discussion of this issue can be...

Author(s): Brad R. Murray, Leigh J. Martin, Colin Brown, Daniel W. Krix, Megan L. Phillips

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

### **Summary of workshop large outdoor fires and the built environment**

[www.nrfirescience.org/resource/18825](http://www.nrfirescience.org/resource/18825)

Large outdoor fires present a risk to the built environment. Wildfires that spread into communities, referred to as Wildland-Urban Interface (WUI) fires, have destroyed communities throughout the world, and are an emerging problem in fire safety science. Other examples are large urban fires including those that have occurred after...

Author(s): Sam Manzello, Raphaelae M. Bianchi, Michael J. Gollner, Daniel J. Gorham, Sara S. McAllister, Elsa Pastor, Eulalia Planas, Pedro Reszka, Sayaka Suzuki

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Does plant flammability differ between leaf and litter bed scale? Role of fuel characteristics and consequences for flammability assessment**

[www.nrfirescience.org/resource/17696](http://www.nrfirescience.org/resource/17696)

The increasing concern regarding fire in the wildland–urban interface (WUI) around the world highlights the need to better understand the flammability of WUI fuels. Research on plant flammability is rapidly increasing but commonly only considers a single fuel scale. In some cases, however, different fuel scales (e.g. leaf and...

Author(s): Anne Ganteaume

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Large outdoor fires and the built environment: Objectives and goals of permanent IAFSS working Group**

[www.nrfirescience.org/resource/18770](http://www.nrfirescience.org/resource/18770)

Large outdoor fires present a risk to the built environment. Examples often in the international media reports are wildfires that spread into communities, referred to as Wildland-Urban Interface (WUI) fires. WUI fires have destroyed communities throughout the world and are a growing problem in fire safety science. Other examples are...

Author(s): Sam Manzello, Sara S. McAllister, Sayaka Suzuki

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Are Wildfires Knocking on the Built-Up Areas Door?**

[www.nrfirescience.org/resource/17638](http://www.nrfirescience.org/resource/17638)

Human-started fires represent the vast majority of wildfires in Mediterranean countries. The current expansion of human settlements into fire-prone territories has led to the creation of landscapes where anthropogenic developments merge with wildland areas. In this context, understanding the role of distance from built-up areas in...

Author(s): Leone D. Mancini, Mario Elia, Anna Barbatì, Luca Salvati, Piermaria Corona, Raffaele Laforteza, Giovanni Sanesi

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Responding to risky neighbors: Testing for spatial spillover effects for defensible space in a fire-prone WUI community**

[www.nrfirescience.org/resource/18318](http://www.nrfirescience.org/resource/18318)

Often, factors that determine the risk of an environmental hazard occur at landscape scales, and risk mitigation requires action by multiple private property owners. How property owners respond to risk mitigation on neighboring lands depends on whether mitigation actions are strategic complements or strategic substitutes. We test...

Author(s): Travis Warziniack, Patricia A. Champ, James R. Meldrum, Hannah Brenkert-Smith, Christopher M. Barth, Lilia C. Falk

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Multiobjective prioritization of preselected fuel treatment strategies for public forestland: a case study in Flathead County, Montana**

[www.nrfirescience.org/resource/17346](http://www.nrfirescience.org/resource/17346)

Preferred fuel treatment strategies (FTSs) were determined for two public forests in Flathead County, Montana, for the period 2010–59 using a multiple-objective evaluation method that accounts for future residential development in the WUI and climate change. Three fuel management objectives were used to evaluate and rank FTSs:...

Author(s): Tony Prato, Travis B. Paveglio

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Residents reduce wildfire risks through the Firewise USA program**

[www.nrfirescience.org/resource/18282](http://www.nrfirescience.org/resource/18282)

Under the Firewise USA™ national recognition program, residents living in the wildland–urban interface have been taking action to reduce the wildfire hazards around the exterior of their homes and in the three home ignition zones on their properties (fig. 1). Both kinds of measures have been part of the

national Firewise USA™...  
Author(s): Cathy Prudhomme  
Year Published: 2018  
Type: Document  
Book or Chapter or Journal Article

### **Understanding the factors that influence perceptions of post-wildfire landscape recovery across 25 wildfires in the northwestern United States**

[www.nrfirescience.org/resource/17306](http://www.nrfirescience.org/resource/17306)

Disturbances such as wildfire are important features of forested landscapes. The trajectory of changes following wildfires (often referred to as landscape recovery) continues to be an important research topic among ecologists and wildfire scientists. However, the landscape recovery process also has important social dimensions that...

Author(s): Chad Kooistra, Troy E. Hall, Travis B. Paveglio, Michael Pickering  
Year Published: 2018  
Type: Document  
Book or Chapter or Journal Article

### **Quantile regression: an alternative approach to modelling forest area burned by individual fires**

[www.nrfirescience.org/resource/18056](http://www.nrfirescience.org/resource/18056)

Components of a fire regime have long been estimated using mean-value-based ordinary least-squares regression. But, forest and fire managers require predictions beyond the mean because impacts of small and large fires on forest ecosystems and wildland–urban interfaces are different. Therefore, different action plans are required...

Author(s): Baburam Rijal  
Year Published: 2018  
Type: Document  
Book or Chapter or Journal Article

### **Rapid growth of the US wildland-urban interface raises wildfire risk**

[www.nrfirescience.org/resource/17146](http://www.nrfirescience.org/resource/17146)

The wildland-urban interface (WUI) is the area where houses and wildland vegetation meet or intermingle, and where wildfire problems are most pronounced. Here we report that the WUI in the United States grew rapidly from 1990 to 2010 in terms of both number of new houses (from 30.8 to 43.4 million; 41% growth) and land area (from...

Author(s): Volker C. Radeloff, David P. Helmers, Heather A. Kramer, Miranda H. Mockrin, Patricia M. Alexandre, Avi Bar-Massada, Van Butsic, Todd J. Hawbaker, Sebastian Martinuzzi, Alexandra D. Syphard, Susan I. Stewart  
Year Published: 2018  
Type: Document  
Book or Chapter or Journal Article

### **The role of trust in homeowner firewise actions**

[www.nrfirescience.org/resource/17758](http://www.nrfirescience.org/resource/17758)

Absher and Vaske conducted a mail survey of rural landowners in heavily forested counties along the Front Range of Colorado. They asked questions designed to measure respondents' trust in (1) the information that the Forest Service provided regarding forest fires, and (2) the agency's competency in responding to fires and...

Author(s): Josh McDaniel  
Year Published: 2018  
Type: Document

Book or Chapter or Journal Article

**Wildland-urban interface residents' relationships with wildfire: Variation within and across communities**

[www.nrfirescience.org/resource/18837](http://www.nrfirescience.org/resource/18837)

Social science offers rich descriptions of relationships between wildland–urban interface residents and wildfire, but syntheses across different contexts might gloss over important differences. We investigate the potential extent of such differences using data collected consistently in sixty-eight Colorado communities and...

Author(s): James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Lilia C. Falk, Pamela Wilson, Christopher M. Barth

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

**Marshall Woods Restoration Project - Challenges to building consensus and conveying fire hazard mitigation and ecological restoration needs to the public**

[www.nrfirescience.org/resource/19686](http://www.nrfirescience.org/resource/19686)

The 28,000-acre Rattlesnake National Recreation Area (RNRA) lies immediately northwest of Missoula, Montana, and is a highly popular recreation destination with an estimated 60,000 annual visitors. The immediate area also contains thousands of residences situated within the Wildland Urban Interface (WUI). In 2005, Missoula County'...

Author(s): Megan P. Keville

Year Published: 2018

Type: Document

Research Brief or Fact Sheet

**Where wildfires destroy buildings in the US relative to the wildland–urban interface and national fire outreach programs**

[www.nrfirescience.org/resource/17694](http://www.nrfirescience.org/resource/17694)

Over the past 30 years, the cost of wildfire suppression and homes lost to wildfire in the US have increased dramatically, driven in part by the expansion of the wildland–urban interface (WUI), where buildings and wildland vegetation meet. In response, the wildfire management community has devoted substantial effort to better...

Author(s): H. Anu Kramer, Miranda H. Mockrin, Patricia M. Alexandre, Susan I. Stewart, Volker C. Radeloff

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

**Wildland-urban interface residents' relationships with wildfire: Variation within and across communities**

[www.nrfirescience.org/resource/18768](http://www.nrfirescience.org/resource/18768)

Social science offers rich descriptions of relationships between wildland-urban interface residents and wildfire, but syntheses across different contexts might gloss over important differences. We investigate the potential extent of such differences using data collected consistently in sixty-eight Colorado communities and...

Author(s): James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Lilia C. Falk, Pamela Wilson, Christopher M. Barth

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Lolo Peak Fire 2017: From the wilderness to the wildland urban interface**

[www.nrfirescience.org/resource/19554](http://www.nrfirescience.org/resource/19554)

The lightning-ignited Lolo Peak fire in the Selway-Bitterroot Wilderness was discovered on July 12, 2017, burning in an area of high tree mortality and rugged terrain. During the field trip, which was held as part of the May 2018 Fire Continuum Conference, managers, scientists, a county sheriff, and a property owner guided 41...

Author(s): Linda Mutch

Year Published: 2018

Type: Document

Research Brief or Fact Sheet

### **Collaboration across boundaries: a policy perspective on the state of wildland fire**

[www.nrfirescience.org/resource/18283](http://www.nrfirescience.org/resource/18283)

The topic of collaboration across boundaries is fitting for me and for the Forest Service because our national priorities revolve around just that—collaboration across boundaries—especially when it comes to wildland fire. We are committed to improving the conditions of the Nation's forests, being good neighbors, and sharing...

Author(s): Vicki Christiansen

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Influences on the adoption and implementation of a wildfire mitigation program in an Idaho city**

[www.nrfirescience.org/resource/17338](http://www.nrfirescience.org/resource/17338)

The Firewise Communities Program and other wildfire mitigation programs promote private property actions that alleviate the growing complexity, costs, and damages from wildfire. Despite significant research surrounding performance of mitigations promoted by Firewise, fewer studies explore community adoption of the program or how...

Author(s): Travis B. Paveglio, Emma Kelly

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Can Air Quality Management Drive Sustainable Fuels Management at the Temperate Wildland–Urban Interface?**

[www.nrfirescience.org/resource/18137](http://www.nrfirescience.org/resource/18137)

Sustainable fire management has eluded all industrial societies. Given the growing number and magnitude of wildfire events, prescribed fire is being increasingly promoted as the key to reducing wildfire risk. However, smoke from prescribed fires can adversely affect public health. We propose that the application of air quality...

Author(s): David M. J. S. Bowman, Lori D. Daniels, Fay H. Johnston, Grant J. Williamson, William Matt Jolly, Sheryl Magzamen, Ana G. Rappold, Michael Brauer, Sarah B. Henderson

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Review of Pathways for Building Fire Spread in the Wildland Urban Interface Part I: Exposure Conditions**

[www.nrfirescience.org/resource/17814](http://www.nrfirescience.org/resource/17814)

While the wildland–urban interface (WUI) is not a new concept, fires in WUI communities have rapidly expanded in frequency and severity over the past few decades. The number of structures lost per year has increased significantly, due in part to increased development in rural areas, fuel management policies, and climate change,...

Author(s): Sara E. Caton, Raquel S. P. Hakes, Daniel J. Gorham, Aixi Zhou, Michael J. Gollner

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Managing Fire and Biodiversity in the Wildland-Urban Interface: A Role for Green Firebreaks**

[www.nrfirescience.org/resource/17110](http://www.nrfirescience.org/resource/17110)

In the wildland-urban interface, the imperative is often to protect life and property from destructive fires, while also conserving biodiversity. One potential tool for achieving this goal is the use of green firebreaks: strips of low flammability species planted at strategic locations to help reduce fire spread by slowing or...

Author(s): Timothy J. Curran, George L.W. Perry, Sarah V. Wyse, Md Azharul Alam

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Overlapping layers of fire management examined through the lens of post-fire erosion - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/17018](http://www.nrfirescience.org/resource/17018)

At the Wildland Urban Interface (WUI), where undeveloped landscapes meet the built environment, there is a complex interaction among local, state and federal land and hazard stakeholders that must work together to protect life and property from wildfire. The effective use of wildfire science is considered key to successful wildfire...

Author(s): Katie Gible, Jennifer L. Pierce, Eric Lindquist

Year Published: 2017

Type: Document

Technical Report or White Paper

### **Adapting to wildfire: Moving beyond homeowner risk perceptions to taking action**

[www.nrfirescience.org/resource/16524](http://www.nrfirescience.org/resource/16524)

Champ's presentation focused on how to get homeowners to take action to protect their properties from fire. She framed this challenge as a last-mile problem, which is a concept from the literature on supply chain. The last mile is the end of the supply chain where a product is transferred to the customer. The last mile is often...

Author(s): Patricia A. Champ

Year Published: 2017

Type: Document

Conference Proceedings

### **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  
Type: Document  
Book or Chapter or Journal Article

### **Human presence diminishes the importance of climate in driving fire activity across the United States**

[www.nrfirescience.org/resource/16345](http://www.nrfirescience.org/resource/16345)

Growing human and ecological costs due to increasing wildfire are an urgent concern in policy and management, particularly given projections of worsening fire conditions under climate change. Thus, understanding the relationship between climatic variation and fire activity is a critically important scientific question. Different...

Author(s): Alexandra D. Syphard, Jon E. Keeley, Anne H. Pfaff, Ken Ferschweiler

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Surface fuel characteristics, temporal dynamics, and fire behavior of masticated mixed-conifer fuelbeds of the U.S. Southeast and Rocky Mountains**

[www.nrfirescience.org/resource/15582](http://www.nrfirescience.org/resource/15582)

Mastication is a wildland fuel treatment technique that is rapidly becoming popular with fire managers for fire hazard reduction projects, especially in areas where reducing fuels with prescribed fire is particularly challenging. Mastication is the process of mechanically modifying the live and dead surface and canopy biomass by...

Author(s): Robert E. Keane, Pamela G. Sikkink, Theresa B. Jain, James J. Reardon

Year Published: 2017

Type: Document

Technical Report or White Paper

### **Wildland urban interface wildfire mitigation desk reference guide**

[www.nrfirescience.org/resource/15251](http://www.nrfirescience.org/resource/15251)

The Wildland Urban Interface Wildfire Mitigation Desk Reference Guide is designed to provide basic background information on relevant programs and terminology for those, whether community members or agency personnel, who are seeking to enhance their community's wildfire mitigation efforts. The four primary objectives of this...

Author(s): National Wildfire Coordinating Group (NWCG)

Year Published: 2017

Type: Document

Management or Planning Document

### **Advancing characterization of social diversity in the wildland-urban interface: an indicator approach for wildfire management**

[www.nrfirescience.org/resource/21904](http://www.nrfirescience.org/resource/21904)

A growing body of research indicates that communities at risk from wildfire differ in terms of the local social context that influences adaptive planning, mitigations or collective actions. Less work has attempted to document critical differences in that local social context across large samples. The research presented here explores...

Author(s): Travis B. Paveglio, Max W. Nielsen-Pincus, Jesse Abrams, Cassandra Moseley

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

**Is the whole greater than the sum of its parts? Homeowner wildfire risk mitigation, community heterogeneity, and fire adaptedness - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/17000](http://www.nrfirescience.org/resource/17000)

In this project we posed the question “Is the whole greater than the sum of its parts?” We focused on homeowner wildfire risk mitigation, community heterogeneity, and fire adaptedness. One of the unique aspects of this project was that the team was a research and practice collaboration. This collaboration facilitated...

Author(s): Patricia A. Champ, Hannah Brenkert-Smith, James R. Meldrum, Christopher M. Barth, Travis Warziniack

Year Published: 2017

Type: Document

Technical Report or White Paper

**Wildland urban interface part II: response of components, systems, and mitigation strategies in the United States**

[www.nrfirescience.org/resource/17715](http://www.nrfirescience.org/resource/17715)

Structure loss in wildland fires has significantly increased over the past few decades, affected by increased development in rural areas, changing fuel management policies, and climate change, all of which are projected to increase in the future. This paper is Part II of a two-part review, which presents a summary of fundamental and...

Author(s): Raquel S. P. Hakes, Sara E. Caton, Daniel J. Gorham, Michael J. Gollner

Year Published: 2017

Type: Document

Synthesis

**Examining the influence of biophysical conditions on wildland-urban interface homeowners' wildfire risk mitigation activities in fire-prone landscapes**

[www.nrfirescience.org/resource/16539](http://www.nrfirescience.org/resource/16539)

Expansion of the wildland–urban interface (WUI) and the increasing size and number of wildfires has policy-makers and wildfire managers seeking ways to reduce wildfire risk in communities located near fire-prone forests. It is widely acknowledged that homeowners can reduce their exposure to wildfire risk by using nonflammable...

Author(s): Christine Olsen, Jeffrey D. Kline, Alan A. Ager, Keith A. Olsen, Karen C. Short

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

**Learn from the burn: The High Park Fire 5 years later**

[www.nrfirescience.org/resource/16520](http://www.nrfirescience.org/resource/16520)

It has been 5 years since the High Park Fire burned over 85,000 acres in Northern Colorado, causing extensive property damage, loss of life, and severe impacts to the water quality of the Poudre River. In the fall of 2016, a conference was organized by the USFS Rocky Mountain Research Station and the Coalition for the Poudre River...

Author(s): Charles C. Rhoades, Peter R. Robichaud, Sandra E. Ryan, Jen Kovecses, Carl Chambers, Sara Rathburn, Jared Heath, Stephanie Kampf, Codie Wilson, Dan Brogan, Brad Piehl, Mary Ellen Miller, John Giordanengo, Erin Berryman, Monique E. Rocca

Year Published: 2017

Type: Document

Research Brief or Fact Sheet

### **Should I stay or should I go now? Or should I wait and see? Influences on wildfire evacuation decisions**

[www.nrfirescience.org/resource/16390](http://www.nrfirescience.org/resource/16390)

As climate change has contributed to longer fire seasons and populations living in fire-prone ecosystems increase, wildfires have begun to affect a growing number of people. As a result, interest in understanding the wildfire evacuation decision process has increased. Of particular interest is understanding why some people leave...

Author(s): Sarah M. McCaffrey, Robyn S. Wilson, Avishek Konar

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Insurance and Wildfire Mitigation: What Do We Know?**

[www.nrfirescience.org/resource/17550](http://www.nrfirescience.org/resource/17550)

There is much interest in the role of insurance in encouraging homeowners to mitigate wildfire risk to their properties. For example, the Fire Adapted Communities Coalition characterizes the insurance industry as a 'nontraditional stakeholder' that 'may reduce future wildfire-related insurance claims by educating homeowners on...

Author(s): James R. Meldrum, Christopher M. Barth, Patricia A. Champ, Hannah Brenkert-Smith, Lilia C. Falk, Travis Warziniack

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Fuel size impacts on carbon residuals and combustion dynamics in masticated woody debris**

[www.nrfirescience.org/resource/14488](http://www.nrfirescience.org/resource/14488)

Mastication of standing trees to reduce crown fuel loading is an increasingly popular method of reducing wildfire hazard in the wildland-urban interface of Canada. Previous research has shown that masticated fuel beds can leave considerable pyrogenic and black carbon residuals after burning, though the impact of fuel particle size...

Author(s): Dan K. Thompson, Tom J. Schiks, B. Mike Wotton

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Planning for wildfire in the wildland-urban interface: a resource guide for Idaho communities**

[www.nrfirescience.org/resource/14856](http://www.nrfirescience.org/resource/14856)

The price of wildfire has never been higher. Why? And what can local communities do about it? One way to measure the price of wildfire is the dollars spent on suppression alone. In 1995, fire made up 16 percent of the U.S. Forest Service's annual appropriation budget; in 2015, wildfire consumed more than 50 percent of the...

Author(s): Stephen R. Miller, Thomas Wuerzer, Jaap Vos, Eric Lindquist, Molly Mowery, Tyre Holfeltz, Brian Stephens, Alexander Grad

Year Published: 2016

Type: Document

Management or Planning Document

### **Living with fire: how social scientists are helping wildland-urban interface communities reduce wildfire risk**

[www.nrfirescience.org/resource/14451](http://www.nrfirescience.org/resource/14451)

Reducing wildfire risk to lives and property is a critical issue for policy makers, land managers, and citizens who reside in high-risk fire areas of the United States - this is especially the case in the Rocky Mountain region and other western states. In order for a wildfire risk reduction effort to be effective in a U.S. wildland-...

Author(s): Brian Cooke

Year Published: 2016

Type: Document

Research Brief or Fact Sheet

### **High resolution mapping of development in the wildland-urban interface using object based image extraction**

[www.nrfirescience.org/resource/14808](http://www.nrfirescience.org/resource/14808)

The wildland-urban interface (WUI), the area where human development encroaches on undeveloped land, is expanding throughout the western United States resulting in increased wildfire risk to homes and communities. Although census based mapping efforts have provided insights into the pattern of development and expansion of the WUI at...

Author(s): Michael D. Caggiano, Wade T. Tinkham, Chad M. Hoffman, Anthony S. Cheng, Todd J. Hawbaker

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Forest density preferences of homebuyers in the wildland-urban interface**

[www.nrfirescience.org/resource/14795](http://www.nrfirescience.org/resource/14795)

In the fire-prone Western U.S., the scale of surrounding forest density can be realized by homebuyers as an amenity for aesthetics and cooling effects, or as a disamenity in terms of wildfire risk. There has been a lack of academic attention to understanding this duality of forest density preferences for homebuyers in at-risk...

Author(s): Evan Hjerpe, Yeon-Su Kim, Leah Dunn

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Understanding the effect of large wildfires on residents' well-being: what factors influence wildfire impact?**

[www.nrfirescience.org/resource/13937](http://www.nrfirescience.org/resource/13937)

Existing social science has indicated that wildfires can affect the short- and long-term functioning of social systems. Less work has focused on how wildfire events affect the physical and psychological well-being of individual residents impacted by such events. In this study, we explore the extent to which personal- or community-...

Author(s): Travis B. Paveglio, Chad Kooistra, Troy E. Hall, Michael Pickering

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Recovery and adaptation after wildfire on the Colorado Front Range (2010-12)**

[www.nrfirescience.org/resource/14703](http://www.nrfirescience.org/resource/14703)

Following the loss of homes to wildfire, when risk has been made apparent, homeowners must decide whether to rebuild, and choose materials and vegetation, while local governments guide recovery and rebuilding. As wildfires are smaller and more localised than other disasters, it is unclear if recovery after wildfire results in policy...

Author(s): Miranda H. Mockrin, Susan I. Stewart, Volker C. Radeloff, Roger B. Hammer  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **The relative impacts of vegetation, topography, and spatial arrangement on building loss to wildfires in case studies of California and Colorado**

[www.nrfirescience.org/resource/13886](http://www.nrfirescience.org/resource/13886)

Context: Wildfires destroy thousands of buildings every year in the wildland urban interface. However, fire typically only destroys a fraction of the buildings within a given fire perimeter, suggesting more could be done to mitigate risk if we understood how to configure residential landscapes so that both people and buildings could...

Author(s): Patricia M. Alexandre, Susan I. Stewart, Miranda H. Mockrin, Nicholas S. Keuler, Alexandra D. Syphard, Avi Bar-Massada, Murray K. Clayton, Volker C. Radeloff  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **Wildfire risk to residential structures in the Island Park Sustainable Fire Community: Caribou-Targhee National Forest**

[www.nrfirescience.org/resource/14695](http://www.nrfirescience.org/resource/14695)

The Island Park Sustainable Fire Community (IPSFC) Project is a collaborative working group of citizens, businesses, non-profit organizations, and local, state, and federal government agencies ([www.islandparkfirecommunity.com](http://www.islandparkfirecommunity.com)) working to create fire-resilient ecosystems in and around the human communities of West Yellowstone,...

Author(s): Don Helmbrecht, Julie W. Gilbertson-Day, Joe H. Scott, LaWen Hollingsworth  
Year Published: 2016  
Type: Document  
Technical Report or White Paper

### **Setting priorities for private land conservation in fire-prone landscapes: Are fire risk reduction and biodiversity conservation competing or compatible objectives?**

[www.nrfirescience.org/resource/14588](http://www.nrfirescience.org/resource/14588)

Although wildfire plays an important role in maintaining biodiversity in many ecosystems, fire management to protect human assets is often carried out by different agencies than those tasked for conserving biodiversity. In fact, fire risk reduction and biodiversity conservation are often viewed as competing objectives. Here we...

Author(s): Alexandra D. Syphard, Van Butsic, Avi Bar-Massada, Jon E. Keeley, Jeff A. Tracey, Robert N. Fisher  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **Places where wildfire potential and social vulnerability coincide in the conterminous United States**

[www.nrfirescience.org/resource/14522](http://www.nrfirescience.org/resource/14522)

The hazards-of-place model posits that vulnerability to environmental hazards depends on both biophysical and social factors. Biophysical factors determine where wildfire potential is elevated, whereas social factors determine where and how people are affected by wildfire. We evaluated place vulnerability to wildfire hazards in the...

Author(s): Gabriel Wigtil, Roger B. Hammer, Jeffrey D. Kline, Miranda H. Mockrin, Susan I. Stewart,

Daniel Roper, Volker C. Radeloff  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **Using community archetypes to better understand differential community adaptation to wildfire risk**

[www.nrfirescience.org/resource/14469](http://www.nrfirescience.org/resource/14469)

One of the immediate challenges of wildfire management concerns threats to human safety and property in residential areas adjacent to non-cultivated vegetation. One approach for relieving this problem is to increase human community 'adaptiveness' to deal with the risk and reality of fire in a variety of landscapes. The challenge...

Author(s): Matthew S. Carroll, Travis B. Paveglio

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Do insurance policies and rates influence home development on fire-prone lands?**

[www.nrfirescience.org/resource/14811](http://www.nrfirescience.org/resource/14811)

The dangers and costs associated with wildfires are rising and predicted to escalate rapidly in decades to come, primarily because of continued home development on fire-prone lands and the effects of climate change. Those interested in reducing wildfire risk have asked whether insurance can play a role in making new and existing...

Author(s): Ray Rasker

Year Published: 2016

Type: Document

Technical Report or White Paper

### **Examining alternative fuel management strategies and the relative contribution of National Forest System land to wildfire risk to adjacent homes - a pilot assessment on the Sierra National Forest, California, USA**

[www.nrfirescience.org/resource/14352](http://www.nrfirescience.org/resource/14352)

Determining the degree of risk that wildfires pose to homes, where across the landscape the risk originates, and who can best mitigate risk are integral elements of effective co-management of wildfire risk. Developing assessments and tools to help provide this information is a high priority for federal land management agencies such...

Author(s): Joe H. Scott, Matthew P. Thompson, Julie W. Gilbertson-Day

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Evaluating the effectiveness of mitigations activities in the wildland urban interface - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/17052](http://www.nrfirescience.org/resource/17052)

There has been relatively little research on Wildland-Urban Interface (WUI) fire spread, compared to fires within structures, despite the increasing frequency and losses from WUI fires. This is due, in part, to the fact that the subject of WUI fire research falls between traditional studies of building fires and forest fires, non-...

Author(s): Alexander Maranghides

Year Published: 2016

Type: Document

### **Evaluating the characteristics of social vulnerability to wildfire: demographics, perceptions, and parcel characteristics**

[www.nrfirescience.org/resource/14804](http://www.nrfirescience.org/resource/14804)

A large body of research focuses on identifying patterns of human populations most at risk from hazards and the factors that help explain performance of mitigations that can help reduce that risk. One common concept in such studies is social vulnerability-human populations' potential exposure to, sensitivity from and ability to...

Author(s): Travis B. Paveglio, Tony Prato, Catrin Edgeley, Derek J. Nalle

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **The affluence-vulnerability interface: intersecting scales of risk, privilege, and disaster**

[www.nrfirescience.org/resource/14766](http://www.nrfirescience.org/resource/14766)

This paper examines vulnerability in the context of affluence and privilege. It focuses on the 1991 Oakland Hills Firestorm in California, USA to examine long-term lived experiences of the disaster. Vulnerability is typically understood as a condition besetting poor and marginalized communities. Frequently ignored in these...

Author(s): Christine Eriksen, Gregory Simon

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Resolving future fire management conflicts using multicriteria decision making**

[www.nrfirescience.org/resource/13893](http://www.nrfirescience.org/resource/13893)

Management strategies to reduce the risks to human life and property from wildfire commonly involve burning native vegetation. However, planned burning can conflict with other societal objectives such as human health and biodiversity conservation. These conflicts are likely to intensify as fire regimes change under future climates...

Author(s): Don A. Driscoll, Michael Bode, Ross A. Bradstock, David A. Keith, Trent D. Penman, Owen F. Price

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Anthropogenic influence on wildfire activity in Alberta, Canada**

[www.nrfirescience.org/resource/14702](http://www.nrfirescience.org/resource/14702)

The boreal forest of Alberta, Canada, is under pressure from a rapid expansion of the wildland-human interface driven by natural resources exploitation. The specific impact of these changes on area burned remains poorly understood. We addressed this issue by modelling area burned for the 1980-2010 period using variables...

Author(s): Francois-Nicolas Robinne, Marc-Andre Parisien, Michael D. Flannigan

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Factors related to building loss due to wildfires in the conterminous United States**

[www.nrfirescience.org/resource/14691](http://www.nrfirescience.org/resource/14691)

Wildfire is globally an important ecological disturbance affecting biochemical cycles and vegetation composition, but also puts people and their homes at risk. Suppressing wildfires has detrimental ecological effects and can promote larger and more intense wildfires when fuels accumulate, which increases the threat to buildings in...

Author(s): Patricia M. Alexandre, Susan I. Stewart, Nicholas S. Keuler, Murray K. Clayton, Miranda H. Mockrin, Avi Bar-Massada, Alexandra D. Syphard, Volker C. Radeloff

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Categorizing the social context of the wildland urban interface: adaptive capacity for wildfire and community 'archetypes'**

[www.nrfirescience.org/resource/21905](http://www.nrfirescience.org/resource/21905)

Understanding the local context that shapes collective response to wildfire risk continues to be a challenge for scientists and policymakers. This study utilizes and expands on a conceptual approach for understanding adaptive capacity to wildfire in a comparison of 18 past case studies. The intent is to determine whether comparison...

Author(s): Travis B. Paveglio, Cassandra Moseley, Matthew S. Carroll, Daniel R. Williams, Emily Jane Davis, A. Paige Fischer

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Evaluating the effectiveness of wildfire mitigation activities in the wildland-urban interface**

[www.nrfirescience.org/resource/14047](http://www.nrfirescience.org/resource/14047)

Each year wildfires damage homes, businesses, communities, watersheds, and forests on millions of acres across the U.S. However there are effective ways to reduce the impact of wildfire. A new report, Evaluating the Effectiveness of Wildfire Mitigation Activities in the Wildland-Urban Interface, shares lessons learned from...

Author(s): Alexander M. Evans, Sarah Auerbach, Lara Wood Miller, Rachel Wood, Krys Nystrom, Jonathan Loevner, Amanda Aragon, Matthew Piccarello, Eytan Krasilovsky

Year Published: 2015

Type: Document

Technical Report or White Paper

### **Re-envisioning community-wildfire relations in the U.S. West as adaptive governance**

[www.nrfirescience.org/resource/13725](http://www.nrfirescience.org/resource/13725)

Prompted by a series of increasingly destructive, expensive, and highly visible wildfire crises in human communities across the globe, a robust body of scholarship has emerged to theorize, conceptualize, and measure community-level resilience to wildfires. To date, however, insufficient consideration has been given to wildfire...

Author(s): Jesse Abrams, Melanie Knapp, Travis B. Paveglio, Autumn Ellison, Cassandra Moseley, Max W. Nielsen-Pincus, Matthew S. Carroll

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Wildland fire management: insights from a foresight panel**

[www.nrfirescience.org/resource/13440](http://www.nrfirescience.org/resource/13440)

Wildland fire management faces unprecedented challenges in the 21st century: the increasingly apparent effects of climate change, more people and structures in the wildland-urban interface, growing

costs associated with wildfire management, and the rise of high-impact fires, to name a few. Given these significant and growing...

Author(s): Robert L. Olson, David N. Bengston, Leif A. DeVaney, Trevor A.C. Thompson

Year Published: 2015

Type: Document

Technical Report or White Paper

### **Community wildfire preparedness: a global state-of-the-knowledge summary of social science research**

[www.nrfirescience.org/resource/13274](http://www.nrfirescience.org/resource/13274)

This article builds on findings from a synthesis of fire social science research that was published from 2000 to 2010 to understand what has been learned more recently about public response to wildfires. Two notable changes were immediately noted in the fairly substantial number of articles published between 2011 and 2014. First,...

Author(s): Sarah M. McCaffrey

Year Published: 2015

Type: Document

Synthesis

### **Categorizing the social context of the wildland urban interface: Adaptive capacity for wildfire and community "archetypes"**

[www.nrfirescience.org/resource/13186](http://www.nrfirescience.org/resource/13186)

Understanding the local context that shapes collective response to wildfire risk continues to be a challenge for scientists and policymakers. This study utilizes and expands on a conceptual approach for understanding adaptive capacity to wildfire in a comparison of 18 past case studies. The intent is to determine whether comparison...

Author(s): Travis B. Paveglio, Cassandra Moseley, Matthew S. Carroll, Daniel R. Williams, Emily Jane Davis, A. Paige Fischer

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Exploring how alternative mapping approaches influence firehazard assessment and human community exposure to wildfire**

[www.nrfirescience.org/resource/13949](http://www.nrfirescience.org/resource/13949)

Attaining fire-adapted human communities has become a key focus of collaborative planning on landscapes across the western United States and elsewhere. The coupling of fire simulation with GIS has expanded the analytical base to support such planning efforts, particularly through the "fireside" concept that identifies areas where...

Author(s): Joe H. Scott, Matthew P. Thompson, Julie W. Gilbertson-Day

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Wildfire evacuation and its alternatives: perspectives from four United States' communities**

[www.nrfirescience.org/resource/21901](http://www.nrfirescience.org/resource/21901)

Recent years have seen growing interest within the United States fire management community in exploring alternatives to the standard approach of evacuating entire populations that are threatened by a wildfire. There has been particular interest in what can be learned from the Australian approach, whereby residents choose whether or...

Author(s): Sarah M. McCaffrey, Alan Rhodes, Melanie Stidham

Year Published: 2015  
Type: Document  
Book or Chapter or Journal Article

### **Climate change and wildfire risk in an expanding wildland-urban interface: a case study from the Colorado Front Range corridor**

[www.nrfirescience.org/resource/13861](http://www.nrfirescience.org/resource/13861)

Context: Wildfire is a particular concern in the wildland-urban interface (WUI) of the western United States where human development occurs close to flammable natural vegetation. Objectives: (1) Assess the relative influences of WUI expansion versus climate-driven fire regime change on spatial and temporal patterns of burned WUI,...

Author(s): Zhihua Liu, Michael C. Wimberly, Aashis Lamsal, Terry L. Sohl, Todd J. Hawbaker

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Community Mitigation Assistance Team: National pilot highlights**

[www.nrfirescience.org/resource/13555](http://www.nrfirescience.org/resource/13555)

Scores of communities nationwide experience the impacts of wildfire every year; thousands of residents evacuate; infrastructure is threatened; many communities, especially those dependent on tourism or natural resources, are economically devastated; and wildfire response costs billions. But the wildfire itself...

Author(s): Pam Leschak

Year Published: 2015

Type: Document

Research Brief or Fact Sheet

### **Understanding social impact from wildfires: advancing means for assessment**

[www.nrfirescience.org/resource/24571](http://www.nrfirescience.org/resource/24571)

There is no uniform means for assessing social impact from wildland fires beyond statistics such as home loss, suppression costs and the number of residents evacuated. In this paper we argue for and provide a more comprehensive set of considerations for gauging social impact following wildfires. These expanded considerations can...

Author(s): Travis B. Paveglio, Hannah Brenkert-Smith, Troy E. Hall, Alistair M. S. Smith

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **The 2010 wildland-urban interface of the conterminous United States**

[www.nrfirescience.org/resource/13412](http://www.nrfirescience.org/resource/13412)

The wildland-urban interface (WUI) is the area where structures and other human development meet or intermingle with undeveloped wildland, and it is where wildfires have their greatest impacts on people. Hence the WUI is important for wildfire management. This document and associated maps summarize the extent of the WUI in the...

Author(s): Sebastian Martinuzzi, Susan I. Stewart, Miranda H. Mockrin, Roger B. Hammer, Volker C. Radeloff, David P. Helmers

Year Published: 2015

Type: Document

Technical Report or White Paper

### **Climate change beliefs and hazard mitigation behaviors: homeowners and wildfire risk**

[www.nrfirescience.org/resource/14535](http://www.nrfirescience.org/resource/14535)

Downscaled climate models provide projections of how climate change may exacerbate the local impacts of natural hazards. The extent to which people facing exacerbated hazard conditions understand or respond to climate-related changes to local hazards has been largely overlooked. In this article, we examine the relationships among...

Author(s): Hannah Brenkert-Smith, James R. Meldrum, Patricia A. Champ

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Rebuilding and new housing development after wildfire**

[www.nrfirescience.org/resource/13201](http://www.nrfirescience.org/resource/13201)

The number of wildland-urban interface communities affected by wildfire is increasing, and both wildfire suppression and losses are costly. However, little is known about post-wildfire response by homeowners and communities after buildings are lost. Our goal was to characterise rebuilding and new development after wildfires across...

Author(s): Patricia M. Alexandre, Miranda H. Mockrin, Susan I. Stewart, Roger B. Hammer, Volker C. Radeloff

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Understanding evacuation preferences and wildfire mitigations among northwest Montana residents**

[www.nrfirescience.org/resource/12955](http://www.nrfirescience.org/resource/12955)

There is currently insufficient information in the United States about residents' planned evacuation actions during wildfire events, including any intent to remain at or near home during fire events. This is incompatible with growing evidence that select populations at risk from wildfire are considering alternatives to evacuation....

Author(s): Travis B. Paveglio, Tony Prato, Douglas Dalenberg, Tyron J. Venn

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **The role of defensible space for residential structure protection during wildfires**

[www.nrfirescience.org/resource/12775](http://www.nrfirescience.org/resource/12775)

With the potential for worsening fire conditions, discussion is escalating over how to best reduce effects on urban communities. A widely supported strategy is the creation of defensible space immediately surrounding homes and other structures. Although state and local governments publish specific guidelines and requirements, there...

Author(s): Alexandra D. Syphard, Teresa J. Brennan, Jon E. Keeley

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Building trust, establishing credibility, and communicating fire issues with the public**

[www.nrfirescience.org/resource/12385](http://www.nrfirescience.org/resource/12385)

With more people than ever living in the vicinity of the wildland-urban interface, communicating wildland fire management activities and building trust with the public is paramount for safety. Although the time and resources it takes to build and maintain the public's trust may seem daunting, it may be one of the

most important...

Author(s): Josh McDaniel

Year Published: 2014

Type: Document

Research Brief or Fact Sheet

### **Are wildfire management resources in the United States efficiently allocated to protect resources at risk? A case study from Montana**

[www.nrfirescience.org/resource/12909](http://www.nrfirescience.org/resource/12909)

Federal wildfire management agencies in the United States are under substantial pressure to reduce and economically justify their expenditures. To support economically efficient management of wildfires, managers need better estimates of the resource benefits and avoided damage costs associated with alternative wildfire management...

Author(s): Derek T. O'Donnell, Tyron J. Venn, David E. Calkin

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Public acceptance of wildland fire and fuel management: panel responses in seven locations**

[www.nrfirescience.org/resource/21917](http://www.nrfirescience.org/resource/21917)

Wildland fire affects both public and private resources throughout the United States. A century of fire suppression has contributed to changing ecological conditions and accumulated fuel loads. Managers have used a variety of approaches to address these conditions and reduce the likelihood of wildland fires that may result in...

Author(s): Eric L. Toman, Bruce A. Shindler, Sarah M. McCaffrey, James Bennett

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Fuel treatment prescriptions alter spatial patterns of fire severity around the wildland-urban interface during the Wallow Fire, Arizona, USA**

[www.nrfirescience.org/resource/23567](http://www.nrfirescience.org/resource/23567)

Fuel reduction treatments are implemented in the forest surrounding the wildland-urban interface (WUI) to provide defensible space and safe opportunity for the protection of homes during a wildfire. The 2011 Wallow Fire in Arizona USA burned through recently implemented fuel treatments in the wildland surrounding residential...

Author(s): Maureen C. Kennedy, Morris C. Johnson

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Learning to coexist with wildfire**

[www.nrfirescience.org/resource/15326](http://www.nrfirescience.org/resource/15326)

The impacts of escalating wildfire in many regions — the lives and homes lost, the expense of suppression and the damage to ecosystem services — necessitate a more sustainable coexistence with wildfire. Climate change and continued development on fire-prone landscapes will only compound current problems. Emerging strategies for...

Author(s): Max A. Moritz, E. Batllori, Ross A. Bradstock, A. Malcolm Gill, J. Handmer, Paul F. Hessburg, J. Leonard, Sarah M. McCaffrey, Dennis C. Odion, Tania L. Schoennagel, Alexandra D. Syphard

Year Published: 2014

Type: Document  
Book or Chapter or Journal Article

**Wildfire, wildlands, and people: understanding and preparing for wildfire in the wildland-urban interface - a forests on the edge report**

[www.nrfirescience.org/resource/16861](http://www.nrfirescience.org/resource/16861)

Fire has historically played a fundamental ecological role in many of America's wildland areas. However, the rising number of homes in the wildland-urban interface (WUI), associated impacts on lives and property from wildfire, and escalating costs of wildfire management have led to an urgent need for communities to become "fire-...

Author(s): Susan M. Stein, Sara J. Comas, James P. Menakis, Mary A. Carr, Susan I. Stewart, Helene Cleveland, Lincoln Bramwell, Volker C. Radeloff

Year Published: 2013

Type: Document  
Technical Report or White Paper

**Fighting fire with fire: does a policy of broad-scale prescribed burning improve community safety?**

[www.nrfirescience.org/resource/17711](http://www.nrfirescience.org/resource/17711)

Wildfires cause enormous damage worldwide, particularly in Victoria, Australia, with growing populations in fire-prone ecosystems. Broad-scale prescribed burning is an established, yet controversial, wildfire management policy in Victoria and Australia. But does broad-scale prescribed burning reduce fire damage? The answer depends...

Author(s): Danielle Clode, Mark A. Elgar

Year Published: 2013

Type: Document  
Book or Chapter or Journal Article

**Living in a tinderbox: wildfire risk perceptions and mitigating behaviours**

[www.nrfirescience.org/resource/14672](http://www.nrfirescience.org/resource/14672)

The loss of homes to wildfires is an important issue in the USA and other countries. Yet many homeowners living in fire-prone areas do not undertake mitigating actions, such as clearing vegetation, to decrease the risk of losing their home. To better understand the complexity of wildfire risk-mitigation decisions and the role of...

Author(s): Patricia A. Champ, Geoffrey H. Donovan, Christopher M. Barth

Year Published: 2013

Type: Document  
Book or Chapter or Journal Article

**Social science at the wildland-urban interface: a compendium of research results to create fire-adapted communities**

[www.nrfirescience.org/resource/22840](http://www.nrfirescience.org/resource/22840)

Over the past decade, a growing body of research has been conducted on the human dimensions of wildland fire. Building on a relatively small number of foundational studies, this research now addresses a wide range of topics including mitigation activities on private lands, fuels reduction treatments on public land, community impacts...

Author(s): Eric L. Toman, Melanie Stidham, Sarah M. McCaffrey, Bruce A. Shindler

Year Published: 2013

Type: Document  
Synthesis

### **The rising cost of wildfire protection**

[www.nrfirescience.org/resource/12409](http://www.nrfirescience.org/resource/12409)

Headwaters Economics produced this report to better understand and address why wildfires are becoming more severe and expensive. The report also describes how the protection of homes in the Wildland-Urban Interface has added to these costs and concludes with a brief discussion of solutions that may help control escalating costs....

Author(s): Ross Gorte

Year Published: 2013

Type: Document

Technical Report or White Paper

### **Creating “Community”? Preparing for Bushfire in Rural Victoria**

[www.nrfirescience.org/resource/21896](http://www.nrfirescience.org/resource/21896)

The term “community” has a long and contested lineage in social analysis and debate. This lineage, however, is not generally recognized in policy and public debates on community and bushfire in Australia. “Community” is thought to be central to bushfire preparedness in Australia, especially in rural areas, but what “...

Author(s): Peter Fairbrother, Meagan Tyler, Alison Hart, Bernard Mees, Richard Phillips, Julie Stratford, Keith Toh

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Social amplification of wildfire risk: the role of social interactions and information sources**

[www.nrfirescience.org/resource/14671](http://www.nrfirescience.org/resource/14671)

Wildfire is a persistent and growing threat across much of the western United States. Understanding how people living in fire-prone areas perceive this threat is essential to the design of effective risk management policies. Drawing on the social amplification of risk framework, we develop a conceptual model of wildfire risk...

Author(s): Hannah Brenkert-Smith, Katherine L. Dickinson, Patricia A. Champ, Nicholas Flores

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Wildfire risk and optimal investments in watershed protection**

[www.nrfirescience.org/resource/16172](http://www.nrfirescience.org/resource/16172)

Following what was then one of the most destructive fire years on record, President Bush signed into law the Healthy Forests Restoration Act of 2003. The law requires no less than fifty percent of all funds allocated for hazardous fuels reductions to occur in the wildland-urban interface (WUI), with the aim of enhancing the...

Author(s): Travis Warziniack, Matthew P. Thompson

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **The role of trust in community wildland fire protection planning**

[www.nrfirescience.org/resource/21899](http://www.nrfirescience.org/resource/21899)

Growing accumulations of fuel, changing climates, and residential development in forested landscapes have accelerated the risk of wildland fire, particularly in the western United States. The magnifying level of risk of fire in the urban-wildland interface requires multiple actors implementing coordinated fuel

management, fire...

Author(s): Paul R. Lachapelle, Stephen F. McCool

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Quantifying the threat of unsuppressed wildfires reaching the adjacent wildland-urban interface on the Bridger-Teton National Forest, Wyoming, USA**

[www.nrfirescience.org/resource/8349](http://www.nrfirescience.org/resource/8349)

An important objective for many federal land management agencies is to restore fire to ecosystems that have experienced fire suppression or exclusion over the last century. Managing wildfires for resource objectives (i.e., allowing wildfires to burn in the absence of suppression) is an important tool for restoring such fire-adapted...

Author(s): Joe H. Scott, Don Helmbrecht, Sean A. Parks, Carol Miller

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Place Mapping and the Role of Spatial Scale in Understanding Landowner Views of Fire and Fuels Management**

[www.nrfirescience.org/resource/21885](http://www.nrfirescience.org/resource/21885)

Place mapping is emerging as a way to understand the spatial components of people's relationships with particular locations and how these relate to support for management proposals. But despite the spatial focus of place mapping, scale is rarely explicitly examined in such exercises. This is particularly problematic since scalar...

Author(s): Michael A. Cacciapaglia, Laurie Yung, Michael E. Patterson

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **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

### **Research perspectives on the public and fire management: a synthesis of current social science on eight essential questions**

[www.nrfirescience.org/resource/12601](http://www.nrfirescience.org/resource/12601)

As part of a Joint Fire Science Program project, a team of social scientists reviewed existing fire social science literature to develop a targeted synthesis of scientific knowledge on the following questions: 1. What is the public's understanding of fire's role in the ecosystem? 2. Who are trusted sources of information about fire...

Author(s): Sarah M. McCaffrey, Christine Olsen

Year Published: 2012

Type: Document  
Synthesis

### **Burning questions for managers: fuels management practices in riparian areas**

[www.nrfirescience.org/resource/8354](http://www.nrfirescience.org/resource/8354)

Vegetation treatment projects for fuel reduction in riparian areas can pose distinct challenges to resource managers. Riparian areas are protected by administrative regulations, many of which are largely custodial and restrict active management. Like uplands, however, riparian areas have been affected by fire suppression, land use,...

Author(s): Kristen E. Meyer, Kathleen A. Dwire, Patricia A. Champ, Sandra E. Ryan, Gregg M. Riegel, Timothy A. Burton

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Trying not to get burned: Understanding homeowners' wildfire risk-mitigation behaviors**

[www.nrfirescience.org/resource/21882](http://www.nrfirescience.org/resource/21882)

Three causes have been identified for the spiraling cost of wildfire suppression in the United States: climate change, fuel accumulation from past wildfire suppression, and development in fire-prone areas. Because little is likely to be performed to halt the effects of climate on wildfire risk, and because fuel-management budgets...

Author(s): Hannah Brenkert-Smith, Patricia A. Champ, Nicholas Flores

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Understanding homeowner preparation and intended actions when threatened by a wildfire**

[www.nrfirescience.org/resource/11138](http://www.nrfirescience.org/resource/11138)

As wildland fires affect more houses, increasing attention is being paid to how homeowners in affected areas respond to the wildfire threat. Most research on homeowner responses to wildfire has focused on actions homeowners take before a fire to mitigate their fire risk, particularly vegetation management. Less attention has been...

Author(s): Sarah M. McCaffrey, Greg Winter

Year Published: 2011

Type: Document

Technical Report or White Paper

### **Complexity of homeowner wildfire risk mitigation: an integration of hazard theories**

[www.nrfirescience.org/resource/21903](http://www.nrfirescience.org/resource/21903)

Each year wildfire affects communities in Canada, resulting in evacuations and, in some cases, loss of homes. Several Canadian wildfire management agencies have initiated mitigation programs aimed at reducing wildfire risk. Successful wildfire mitigation involves both community-level and homeowner action. This paper examines factors...

Author(s): Bonita McFarlane, Tara K. McGee

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

### **Public engagement in neighbourhood level wildfire mitigation and preparedness: case studies from Canada, the US and Australia**

[www.nrfirescience.org/resource/12432](http://www.nrfirescience.org/resource/12432)

This study examined neighbourhood level wildfire mitigation programs being implemented in neighbourhoods in Canada (FireSmart-ForestWise), Australia (Community Fireguard) and the US (Firewise Communities). Semi-structured interviews were completed with 19 residents participating in the programs. A wide range of activities were...

Author(s): Tara K. McGee

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

### **Fire safe councils in the interface**

[www.nrfirescience.org/resource/21889](http://www.nrfirescience.org/resource/21889)

Legislators exhort government agencies to work with the public to reduce fire hazards in the wildland-urban interface. However, working with an unorganized 'public' is a challenge for agencies. We present survey research on fire safe councils in California, community-based groups that work to reduce wildfire hazards with a range of...

Author(s): Yvonne Everett, Michelle Fuller

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

### **Reducing fuels in the wildland-urban interface: community perceptions of agency fuels treatments**

[www.nrfirescience.org/resource/11452](http://www.nrfirescience.org/resource/11452)

Wildland fires and resulting effects have increased in recent years. Efforts are under way nationwide to proactively manage vegetative conditions to reduce the threat of wildland fires. Public support is critical to the successful implementation of fuels reduction programs, particularly at the wildland-urban interface. This study...

Author(s): Eric Toman, Melanie Stidham, Bruce A. Shindler, Sarah M. McCaffrey

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

### **Proceedings of the Second Conference on the Human Dimensions of Wildland Fire**

[www.nrfirescience.org/resource/17808](http://www.nrfirescience.org/resource/17808)

This proceedings contains articles, posters, and abstracts of presentations from the second Human Dimensions of Wildland Fire Conference held 27-29 April 2010 in San Antonio, Texas. The conference covered the social issues at the root of wildland fire management's most serious challenges. Specific topics included: firefighter and...

Year Published: 2011

Type: Document

Conference Proceedings

### **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

### **The art of learning: wildfire, amenity migration and local environmental knowledge**

[www.nrfirescience.org/resource/21888](http://www.nrfirescience.org/resource/21888)

Communicating the need to prepare well in advance of the wildfire season is a strategic priority for wildfire management agencies worldwide. However, there is considerable evidence to suggest that although these agencies invest significant effort towards this objective in the lead up to each wildfire season, landholders in at-risk...

Author(s): Christine Eriksen, Timothy Prior

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

### **Outreach programs, peer pressure, and common sense: what motivates homeowners to mitigate wildfire risk?**

[www.nrfirescience.org/resource/8335](http://www.nrfirescience.org/resource/8335)

In recent years, altered forest conditions, climate change, and the increasing numbers of homes built in fire prone areas has meant that wildfires are affecting more people. An important part of minimizing the potential negative impacts of wildfire is engaging homeowners in mitigating the fire hazard on their land. It is therefore...

Author(s): Sarah M. McCaffrey, Melanie Stidham, Eric Toman, Bruce A. Shindler

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

### **Alternatives to evacuation during wildland fire: exploring adaptive capacity in one Idaho community**

[www.nrfirescience.org/resource/11993](http://www.nrfirescience.org/resource/11993)

The use of alternatives to evacuation during wildfire events continues to be an intensely debated strategy in the professional and policy circles of numerous fire-prone countries. The most recent chapter comes in response to the Black Saturday Fires in Australia, which has led to policy changes concerning alternatives to evacuation...

Author(s): Travis B. Paveglio, Matthew S. Carroll, Pamela J. Jakes

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **National Fire Plan fuels treatments target the wildland-urban interface in the western United States**

[www.nrfirescience.org/resource/8351](http://www.nrfirescience.org/resource/8351)

The article 'Implementation of National Fire Plan treatments in the wildland-urban interface in the western United States' (1) is misleading because it is based on wildland-urban interface (WUI) designations not used by federal agencies or their state and local partners. Moreover, by omitting any examination of the allotment of...

Author(s): Allan Fitzsimmons

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

## **Synthesis of Knowledge on the Effects of Fire and Thinning Treatments on Understory Vegetation in U.S. Dry Forests**

[www.nrfirescience.org/resource/22845](http://www.nrfirescience.org/resource/22845)

The results of this synthesis illustrate several important lessons. First, current forest structure is the result of decades of fire-suppression activities, and so restoration will require multiple treatments to bring forests to within the range of historic variation. Second, while the treatments discussed in this document generally...

Author(s): Anne Bartuszevige, Patricia L. Kennedy

Year Published: 2009

Type: Document

Synthesis

## **Implementation of National Fire Plan fuel treatments near the wildland-urban interface in the western United States**

[www.nrfirescience.org/resource/8225](http://www.nrfirescience.org/resource/8225)

Because of increasing concern about the effects of catastrophic wildland fires throughout the western United States, federal land managers have been engaged in efforts to restore historical fire behavior and mitigate wildfire risk. During the last 5 years (2004-2008), 44,000 fuels treatments were implemented across the western...

Author(s): Tania L. Schoennagel, Cara R. Nelson, David M. Theobald, Gunnar C. Carnwath, Teresa B. Chapman

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

## **Temporal and spatial structure in a daily wildfire-start data set from the western United States (1986-96)**

[www.nrfirescience.org/resource/8201](http://www.nrfirescience.org/resource/8201)

The temporal and spatial structure of 332 404 daily fire-start records from the western United States for the period 1986 through 1996 is illustrated using several complimentary visualisation techniques. We supplement maps and time series plots with Hovmiller diagrams that reduce the spatial dimensionality of the daily data in order...

Author(s): Patrick J. Bartlein, Steven W. Hostetler, Sarah L. Shafer, J. O. Holman, Allen M. Solomon

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

## **Potential for future development on fire-prone lands**

[www.nrfirescience.org/resource/12009](http://www.nrfirescience.org/resource/12009)

Most studies of wildland fire and residential development have focused on the cost of firefighting and solutions such as fuel reduction and fire-safe home building. Although some studies quantify the number of homes being built near forests, little research has indicated the potential magnitude of the problem in the future. This...

Author(s): Patricia Gude, Ray Rasker, Jeff van den Noort

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

## **The homeowner view of thinning methods for fire hazard reduction: more positive than many think**

[www.nrfirescience.org/resource/11486](http://www.nrfirescience.org/resource/11486)

With the focus of the National Fire Plan on decreasing fire risk in the wildland-urban interface, fire managers are increasingly tasked with reducing the fuel load in areas where mixed public and private ownership and a growing number of homes can make most fuel reduction methods problematic at best. In many of these intermix areas...

Author(s): Sarah M. McCaffrey

Year Published: 2008

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Northern Inland West land/homeowner perceptions of fire risk and responsibility in the wildland-urban interface**

[www.nrfirescience.org/resource/8338](http://www.nrfirescience.org/resource/8338)

The issue of sorting through who should bear responsibility for mitigating wildfire risk in the wildland-urban interface of the northern Inland West was approached using focus groups. The groups were selected to reflect a variety of stakeholders in the study area population for whom interface issues are relevant. Most participants...

Author(s): Brad R. Weisshaupt, Pamela J. Jakes, Matthew S. Carroll, Keith A. Blatner

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

### **Improving wildfire preparedness: lessons from communities across the US**

[www.nrfirescience.org/resource/7947](http://www.nrfirescience.org/resource/7947)

Communities across the U.S. have been taking action to adapt to the wildfire risk they face. In a series of case studies conducted in 15 communities, researchers identified and described four elements that form the foundation for community wildfire preparedness: landscape, government, citizens, and community.

Author(s): Pamela J. Jakes, Linda E. Kruger, Martha C. Monroe, Kristen C. Nelson, Victoria Sturtevant

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

### **Development of initial Wildland Fire Use documentation for Charles M. Russell National Wildlife Refuge**

[www.nrfirescience.org/resource/11077](http://www.nrfirescience.org/resource/11077)

The Charles M. Russell National Wildlife Refuge manages ecosystems that depend on fire for their maintenance. Fire is abundant in and adjacent to the refuge where lightning and human ignitions can rapidly spread in grass and shrub fuels. Farm and ranch land which would be adversely impacted by fire, pose a significant logistical...

Author(s): Bill Clark, Doug Stephen, Pat Stephen, Laurie L. Kurth, Ken Kerr

Year Published: 2006

Type: Document

Management or Planning Document

### **Managing for fire in the interface: challenges and opportunities**

[www.nrfirescience.org/resource/157](http://www.nrfirescience.org/resource/157)

Fire managers define the wildland-urban interface as all areas where flammable wildland fuels are adjacent to homes and communities. With this definition, the wild-land-urban interface may encompass a much broader landscape than traditionally perceived. For example, the Tunnel Fire in the Oakland hills in 1991 included a large area...

Author(s): Alan J. Long, Dale D. Wade, Frank C. Beall

Year Published: 2005  
Type: Document  
Book or Chapter or Journal Article

### **New technology for fuel breaks and green strips in urban interface and wildland areas**

[www.nrfirescience.org/resource/11039](http://www.nrfirescience.org/resource/11039)

Threat from wildfire can be greatly minimized through proactive efforts that reduce and slow spread through use of green strips or fuel breaks, and decrease fire volatility by reducing fuel load. This results in greater safety to fire fighters and protection to key urban interface areas or wildlife habitat. The fight against western...

Author(s): Jennifer L. Vollmer  
Year Published: 2005  
Type: Document  
Conference Proceedings

### **Acceptability of smoke from prescribed forest burning in the northern inland west: a focus group approach**

[www.nrfirescience.org/resource/8393](http://www.nrfirescience.org/resource/8393)

Focus groups were used to gauge tolerance of smoke from broadcast prescribed forest burning in the wildland-urban interface of the northern Inland West. Focus group participants worked through issues surrounding prescribed burning as a management tool to determine if the origin of smoke made a difference in the acceptance of that...

Author(s): Brad R. Weisshaupt, Matthew S. Carroll, Keith A. Blatner, William D. Robinson, Pamela J. Jakes  
Year Published: 2005  
Type: Document  
Book or Chapter or Journal Article

### **Red Lodge, Montana: steps to improve community preparedness for wildfire**

[www.nrfirescience.org/resource/11104](http://www.nrfirescience.org/resource/11104)

This is a government publication outlining the steps to wildfire preparedness in Red Lodge, MT. The key features include homeowners' associations, which lead in fuel reduction around properties; USFS recreation residences, which conduct fuel reduction projects; evacuation plans and fuel breaks; regulations; and relationships, which...

Author(s): Victoria Sturtevant, Linda E. Kruger  
Year Published: 2004  
Type: Document  
Research Brief or Fact Sheet

### **Keys to community preparedness for wildfire**

[www.nrfirescience.org/resource/11403](http://www.nrfirescience.org/resource/11403)

Assessments of a community's vulnerability to wildfires often focus on landscape conditions or ecological factors such as forest type, age distribution, forest health, topography, or hydrology. However, vulnerability is also a function of a variety of social factors. We need to understand both the social and ecological factors that...

Author(s): Linda E. Kruger, Shruti Agrawal, Martha C. Monroe, Erika A. Lang, Kristen C. Nelson, Pamela J. Jakes, Victoria Sturtevant, Sarah M. McCaffrey, Yvonne Everett  
Year Published: 2003  
Type: Document  
Conference Proceedings, Technical Report or White Paper

**A collaborative fire hazard reduction/ecosystem restoration stewardship project in a Montana mixed ponderosa pine/Douglas-fir/western larch wildland-urban interface**

[www.nrfirescience.org/resource/11009](http://www.nrfirescience.org/resource/11009)

Forest Service managers and researchers designed and evaluated alternative disturbance-based fire hazard reduction/ecosystem restoration treatments in a greatly altered low-elevation ponderosa pine/Douglas-fir/western larch wildland urban interface. Collaboratively planned improvement cutting and prescribed fire treatment...

Author(s): Steve Slaughter, Laura Ward, Michael Hillis, Jimmie D. Chew, Becky McFarlan

Year Published: 2003

Type: Document

Conference Proceedings

**Microsimulation of neighborhood evacuations in the urban-wildland interface**

[www.nrfirescience.org/resource/11491](http://www.nrfirescience.org/resource/11491)

Residential development in fire-prone wildlands is occurring at an unprecedented rate. Community-based evacuation planning in many areas is an emerging need. In this paper we present a method for using microscopic traffic simulation to develop and test neighborhood evacuation plans in the urban - wildland interface. The method...

Author(s): Thomas J. Cova, Justin P. Johnson

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

**Preventing disaster: home ignitability in the wildland-urban interface**

[www.nrfirescience.org/resource/159](http://www.nrfirescience.org/resource/159)

Wildland-urban interface (W-UI) fires are a significant concern for federal, state, and local land management and fire agencies. Research using modeling, experiments, and W-UI case studies indicates that home ignitability during wildland fires depends on the characteristics of the home and its immediate surroundings. These findings...

Author(s): Jack D. Cohen

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

**The Bitterroot Ecosystem Management Research Project: what we have learned, symposium proceedings; May 18-20, 1999; Missoula, MT**

[www.nrfirescience.org/resource/11890](http://www.nrfirescience.org/resource/11890)

The varied topics presented in these symposium proceedings represent the diverse nature of the Bitterroot Ecosystem Management Research Project (BEMRP). Separated into six sections, the papers cover the different themes researched by BEMRP collaborators as well as brief overviews of five other ecosystem management projects. The...

Author(s): Helen Y. Smith

Year Published: 2000

Type: Document

Conference Proceedings

**A site-specific approach for assessing the fire risk to structures at the wildland/urban interface**

[www.nrfirescience.org/resource/12423](http://www.nrfirescience.org/resource/12423)

The essence of the wildland/urban interface fire problem is the loss of homes. The problem is not new, but is becoming increasingly important as more homes with inadequate adherence to safety codes are

built at the wildland/urban interface. Current regulatory codes are inflexible. Specifications for building and site characteristics...

Author(s): Jack D. Cohen

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Protecting people and homes from wildfire in the interior West: proceedings of the symposium and workshop**

[www.nrfirescience.org/resource/11968](http://www.nrfirescience.org/resource/11968)

Includes 25 invited papers and panel discussions, 6 workshop reports, and 15 poster papers that focus on the escalating problem of wildfire in wildland residential areas throughout the western United States and Canada.

Author(s): William C. Fischer, Stephen F. Arno

Year Published: 1988

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Wildfires and WUI fire fatalities**

[www.nrfirescience.org/resource/21440](http://www.nrfirescience.org/resource/21440)

Understanding the detailed physical and social context surrounding wildfire and WUI fire fatalities is crucial in terms of ensuring effective emergency management policy and practice. Studies of fatalities over prolonged periods ensure changing trends in vulnerabilities and exposure are identified (e.g., Haynes et al. 2010; Molina-...

Author(s): Katharine Haynes, Karen C. Short, Gavriil Xanthopoulos, Domingos Xavier Viegas, Luís M. Ribeiro, Raphaele M. Blanchi

Type: Document

Book or Chapter or Journal Article