Role of firebrand combustion in large outdoor fire spread
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

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

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
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

Modeling individual and group evacuation decisions during wildfires
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
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 Wadhwani
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Thermal characterization of firebrand piles
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 exposure to the wildland urban interface in the western US
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
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
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

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)

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

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

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
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
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
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
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
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
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
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
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
Technical Report or White Paper

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

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
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
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 km² 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
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
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...
Scalable evacuation routing in a dynamic environment
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....

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

The role of trust in homeowner firewise actions
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...

Does plant flammability differ between leaf and litter bed scale? Role of fuel characteristics and consequences for flammability assessment
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...
Summary of workshop large outdoor fires and the built environment

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, Raphaele M. Blanchi, 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

Are Wildfires Knocking on the Built-Up Areas Door?

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 Barbati, Luca Salvati, Piermaria Corona, Raffaele Lafortezza, Giovanni Sanesi
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
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

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

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

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

Residents reduce wildfire risks through the Firewise USA program
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 (fg. 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

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

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

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

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

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

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

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

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

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

Managing Fire and Biodiversity in the Wildland-Urban Interface: A Role for Green Firebreaks
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
Review of Pathways for Building Fire Spread in the Wildland Urban Interface Part I: Exposure Conditions

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

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

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 Gibble, Jennifer L. Pierce, Eric Lindquist
Year Published: 2017
Type: Document

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

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

Network analysis of wildfire transmission and implications for risk governance

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

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

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

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

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

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

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...

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

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...

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

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-...

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

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...
Forest density preferences of homebuyers in the wildland-urban interface
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
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
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
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
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) 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
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
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
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?
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

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

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
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

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 characteristics of social vulnerability to wildfire: demographics, perceptions, and parcel characteristics

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

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
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
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
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

Evaluating the effectiveness of wildfire mitigation activities in the wildland-urban interface
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
Re-envisioning community-wildfire relations in the U.S. West as adaptive governance

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

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

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"

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
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

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
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
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

The 2010 wildland-urban interface of the conterminous United States
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
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
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
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
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

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

Learning to coexist with wildfire
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. Battlori, 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

The rising cost of wildfire protection
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

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

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
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

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
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
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
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

Understanding homeowner preparation and intended actions when threatened by a wildfire
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
Reducing fuels in the wildland-urban interface: community perceptions of agency fuels treatments
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
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

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

How fuel treatments saved homes from the 2011 Wallow fire
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

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

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

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

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

Implementation of National Fire Plan fuel treatments near the wildland-urban interface in the western United States

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

The homeowner view of thinning methods for fire hazard reduction: more positive than many think

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

**Temporal and spatial structure in a daily wildfire-start data set from the western United States (1986-96)**

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 Hovmoller 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

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

**Northern Inland West land/homeowner perceptions of fire risk and responsibility in the wildland-urban interface**

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

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
Development of initial Wildland Fire Use documentation for Charles M. Russell National Wildlife Refuge
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
Fire managers define the wildland-urban interface as all areas were 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
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
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
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
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
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
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
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...

**The Bitterroot Ecosystem Management Research Project: what we have learned, symposium proceedings; May 18-20, 1999; Missoula, MT**

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...

**A site-specific approach for assessing the fire risk to structures at the wildland/urban interface**

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...

**Protecting people and homes from wildfire in the interior West: proceedings of the symposium and workshop**

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):**

- Jack D. Cohen
- Helen Y. Smith
- Jack D. Cohen
- William C. Fischer, Stephen F. Arno

**Year Published:**

- 2000
- 1999
- 1991
- 1988

**Type:**

- Document
- Document
- Document
- Document

**Book or Chapter or Journal Article**

- Conference Proceedings
- Conference Proceedings
- Conference Proceedings, Technical Report or White Paper
- Conference Proceedings, Technical Report or White Paper