Wildfires in the wildland-urban interface: key concepts and evaluation methodologies
www.nrfirescience.org/resource/20937
Over the last decades, the different issues regarding the expansion of the wildland-urban interface (WUI) - particularly those related to fires - have spread around the world with particular exposure in the USA, Canada, Australia, and, more recently, in southern European countries (e.g. Portugal and Greece). It has been receiving...
Author(s): A. Bento-Gonçalves, A. Vieira
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Support for regulatory and voluntary approaches to wildfire adaptation among unincorporated wildland-urban interface communities
www.nrfirescience.org/resource/20811
Regulation of building standards and residential development practices in the wildland-urban interface (WUI) is increasingly advocated as a possible avenue for wildfire risk reduction. However, many documented instances of successful wildfire adaptation occur in incorporated communities with local governments or formalized...
Author(s): Catrin Edgeley, Travis B. Paveglio, Daniel R. Williams
Year Published: 2020
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

Determinants of perceived risk and liability concerns associated with prescribed burning in the United States
www.nrfirescience.org/resource/19212
While prescribed burning is a proven tool in the management of forests and grasslands, its use has been limited due, in part, to potential risks that may result in legal liability, property damage, and personal injury. The purpose of this study is to understand the factors that shape landowners' and fire professionals' perceptions...
Author(s): Omkar Joshi, Neelam C. Poudyal, John R. Weir, Samuel D. Fuhlendorf, Thomas O. Ochuodho
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

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

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
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

Understanding homeowners' decisions to mitigate wildfire risk and create defensible space
www.nrfirescience.org/resource/20377
This article analyses homeowners' decisions to undertake fire-safe investments and create defensible space on their property using a unique dataset from 35 wildland–urban interface communities in Nevada. The dataset combines homeowner information from a mail survey with their observed fire-safe investments obtained through...
Author(s): Angelo M. Sisante, Michael H. Taylor, Kimberly Rollins
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Interactions between Resident Risk Perceptions and Wildfire Risk Mitigation: Evidence from Simultaneous Equations Modeling
www.nrfirescience.org/resource/20003
Fire science emphasizes that mitigation actions on residential property, including structural hardening and maintaining defensible space, can reduce the risk of wildfire at a home. Accordingly, a rich body of social science literature investigates the determinants of wildfire risk mitigation behaviors of residents living in fire-...
Author(s): James R. Meldrum, Hannah Brenkert-Smith, Patricia A. Champ, Jamie Gomez, Lilia C. Falk, Christopher M. Barth
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Living with wildfire in Archeluta County, Colorado: 2015 data report
www.nrfirescience.org/resource/19839
Residents in the wildland-urban interface (WUI) can play an important role in reducing wildfire's negative effects by performing wildfire risk mitigation on their property. This report offers insight into the wildfire risk mitigation activities and related considerations, such as attitudes, experiences, and concern about wildfire...

Author(s): James R. Meldrum, Hannah Brenkert-Smith, Pamela Wilson, Patricia A. Champ, Christopher M. Barth, Angela Boag
Year Published: 2019
Type: Document
Technical Report or White Paper

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

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

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

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

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

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

Social Factors in Wildland Fire
www.nrfirescience.org/resource/18158
The socio-environmental dimension in wildland fire management is critical for moving towards a baseline of firewise planning. Wildland fire risk planning is a land use planning tool that should be able to keep pace with rapid rates of social and environmental change. Changes in land use and climate bring alterations in fire regimes...
Author(s): David Martín Gallego, Eduard Plana Bach, Domingo Molina Terrén
Year Published: 2018
Type: Document
Book or Chapter or Journal Article

Incorporating social diversity into wildfire management: proposing 'pathways' for fire adaptation
www.nrfirescience.org/resource/17900
Existing research suggests that adoption or development of various wildfire management strategies may differ across communities. However, there have been few attempts to design diverse strategies for local populations to better “live with fire.” This article extends an existing approach by articulating how characteristic...
Author(s): Travis B. Paveglio, Matthew S. Carroll, Amanda M. Stasiewicz, Daniel R. Williams, Dennis Becker
Year Published: 2018
Type: Document
Book or Chapter or Journal Article

Wildfire risk reduction in the United States: Leadership staff perceptions of local fire department roles and responsibilities
www.nrfirescience.org/resource/16481
As wildland fires have had increasing negative impacts on a range of human values, in many parts of the United States (U.S.) and around the world, collaborative risk reduction efforts among agencies, homeowners, and fire departments are needed to improve wildfire safety and mitigate risk. Using interview data from 46 senior officers...
Author(s): Rachel S. Madsen, Hylton J. G. Haynes, Sarah M. McCaffrey
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

Where wildfires destroy buildings in the US relative to the wildland-urban interface and national fire outreach programs
www.nrfirescience.org/resource/17901
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): Heather A. Kramer, Miranda H. Mockrin, Patricia M. Alexandre, Susan I. Stewart, Volker C. Radeloff
Year Published: 2018
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
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

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
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

Is seeing believing? Perceptions of wildfire risk over time
www.nrfirescience.org/resource/14317
Ongoing challenges to understanding how hazard exposure and disaster experiences influence perceived risk lead us to ask: Is seeing believing? We approach risk perception by attending to two components of overall risk perception: perceived probability of an event occurring and perceived consequences if an event occurs. Using a two-...
Author(s): Patricia A. Champ, Hannah Brenkert-Smith
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

Understanding gaps between the risk perceptions of wildland-urban interface (WUI) residents and wildfire professionals
www.nrfirescience.org/resource/13447
Research across a variety of risk domains finds that the risk perceptions of professionals and the public differ. Such risk perception gaps occur if professionals and the public understand individual risk factors differently or if they aggregate risk factors into overall risk differently. The nature of such divergences, whether...
Author(s): James R. Meldrum, Patricia A. Champ, Hannah Brenkert-Smith, Travis Warziniack, Christopher M. Barth, Lilia C. Falk
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Coupling the biophysical and social dimensions of wildfire risk to improve wildfire mitigation planning
www.nrfirescience.org/resource/19558
We describe recent advances in biophysical and social aspects of risk and their potential combined contribution to improve mitigation planning on fire-prone landscapes. The methods and tools provide an improved method for defining the spatial extent of wildfire risk to communities compared to current planning processes. They also...
Author(s): Alan A. Ager, Jeffrey D. Kline, A. Paige Fischer
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Catching fire? Social interactions, beliefs, and wildfire risk mitigation behaviors
www.nrfirescience.org/resource/13419

Social interactions are widely recognized as a potential influence on risk-related behaviors. We present a mediation model in which social interactions (classified as formal/informal and generic/fire-specific) are associated with beliefs about wildfire risk and mitigation options, which in turn shape wildfire mitigation behaviors....
Author(s): Patricia A. Champ, Katherine L. Dickinson, Hannah Brenkert-Smith, Nicholas Flores
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

How risk management can prevent future wildfire disasters in the wildland-urban interface
www.nrfirescience.org/resource/12757
Recent fire seasons in the western United States are some of the most damaging and costly on record. Wildfires in the wildland-urban interface on the Colorado Front Range, resulting in thousands of homes burned and civilian fatalities, although devastating, are not without historical reference. These fires are consistent with the...
Author(s): David E. Calkin, Jack D. Cohen, Mark A. Finney, Matthew P. Thompson
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

A national approach for integrating wildfire simulation modeling into wildland urban interface risk assessments within the United States
www.nrfirescience.org/resource/12739
Ongoing human development into fire-prone areas contributes to increasing wildfire risk to human life. It is critically important, therefore, to have the ability to characterize wildfire risk to populated places, and to identify geographic areas with relatively high risk. A fundamental component of wildfire risk analysis is...
Author(s): Jessica R. Haas, David E. Calkin, Matthew P. Thompson
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

Simulating effects of land use policies on extent of the wildland urban interface and wildfire risk in Flathead County, Montana
www.nrfirescience.org/resource/12036
This study used a wildfire loss simulation model to evaluate how different land use policies are likely to influence wildfire risk in the wildland urban interface (WUI) for Flathead County, Montana. The model accounts for the complex socio-ecological interactions among climate change, economic growth, land use change and policy,...
Author(s): Travis B. Paveglio, Tony Prato, Michael Hardy
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

Analyzing wildfire exposure and source-sink relationships on a fire prone forest landscape
www.nrfirescience.org/resource/12736
We used simulation modeling to analyze wildfire exposure to social and ecological values on a 0.6 million ha national forest in central Oregon, USA. We simulated 50,000 wildfires that replicated recent fire events in the area and generated detailed maps of burn probability (BP) and fire intensity distributions. We also recorded the...
Author(s): Alan A. Ager, Nicole M. Vaillant, Mark A. Finney, Haiganoush K. Preisler

Year Published: 2011
Type: Document
Book or Chapter or Journal Article

A comparison of landscape fuel treatment strategies to mitigate wildland fire risk in the urban interface and preserve old forest structure
www.nrfirescience.org/resource/12725
We simulated fuel reduction treatments on a 16,000 ha study area in Oregon, US, to examine tradeoffs between placing fuel treatments near residential structures within an urban interface, versus treating stands in the adjacent wildlands to meet forest health and ecological restoration goals. The treatment strategies were evaluated...
Author(s): Alan A. Ager, Nicole M. Vaillant, Mark A. Finney
Year Published: 2010
Type: Document
Book or Chapter or Journal Article

Wildfire risk and hazard: procedures for the first approximation
www.nrfirescience.org/resource/12726
This report was designed to meet three broad goals: (1) evaluate wildfire hazard on Federal lands; (2) develop information useful in prioritizing where fuels treatments and mitigation measures might be proposed to address significant fire hazard and risk; and (3) develop risk-based performance measures to document the effectiveness...
Author(s): David E. Calkin, Alan A. Ager, Julie W. Gilbertson-Day
Year Published: 2010
Type: Document
Technical Report or White Paper

A new process for organizing assessments of social, economic, and environmental outcomes: case study of wildland fire management in the USA
www.nrfirescience.org/resource/12416
Ecological risk assessments typically are organized using the processes of planning (a discussion among managers, stakeholders, and analysts to clarify ecosystem management goals and assessment scope) and problem formulation (evaluation of existing information to generate hypotheses about adverse ecological effects, select...
Author(s): Randall J. F. Bruins, Wayne R. Munns, Stephen J. Botti, Steve Brink, David Cleland, Larry Kapustka, Danny C. Lee, Valerie Luzadis, Laura Falk McCarthy, Naureen Rana, Douglas B. Rideout, Matthew G. Rollins, Peter Woodbury, Mike Zupko
Year Published: 2009
Type: Document
Book or Chapter or Journal Article, Management or Planning Document

Mapping tradeoffs in values at risk at the interface between wilderness and non-wilderness lands
www.nrfirescience.org/resource/11063
On the Flathead Indian Reservation in Montana, U.S., the Mission Mountains Tribal Wilderness is bordered by a buffer zone. To successfully improve forest health within that buffer zone and restore fire in the wilderness, the managing agency and the public need to work together to find solutions to increasingly threatening fuel...
Author(s): Alan E. Watson, Roian Matt, Tim Waters, Kari Gunderson, Stephen J. Carver, Brett Davis
Year Published: 2009
Type: Document

Conference Proceedings

Managing fire risk in the forests of the U.S. inland Northwest: a classic "wicked problem" in public land policy
www.nrfirescience.org/resource/11066
In their classic article published in the Journal of Forestry in 1986, Gerald Allen and Ernest Gould stated that the most daunting problems associated with public forest management have a "wicked" element: "Wicked problems share characteristics. Each can be considered as simply a symptom of some higher order problem-The definition...
Author(s): Matthew S. Carroll, Keith A. Blatner, Patricia J. Cohn, Charles E. Keegan, Todd A. Morgan
Year Published: 2008
Type: Document
Conference Proceedings, Synthesis, Technical Report or White Paper

Forests at risk: integrating risk science into fuel management strategies
www.nrfirescience.org/resource/11089
The threat from wildland fire continues to grow across many regions of the Western United States. Drought, urbanization, and a buildup of fuels over the last century have contributed to increasing wildfire risk to property and highly valued natural resources. Fuel treatments, including thinning overly dense forests to reduce fuel...
Author(s): Jonathan Thompson
Year Published: 2008
Type: Document
Research Brief or Fact Sheet

Predicting risks of uncharacteristic wildfires: application of the risk assessment process
www.nrfirescience.org/resource/12714
The National Environmental Policy Act (NEPA) mandates that the U.S. Forest Service (USFS) conduct an Environmental Impact Assessment (EIA) as its fire management policy evolves to cope with a legacy of over 100 years of fire suppression on national forest lands and an increasing occurrence of uncharacteristically large, intense...
Author(s): Anne Fairbrother, Jessica G. Turnley
Year Published: 2005
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...
Author(s): Jack D. Cohen
Year Published: 2000
Type: Document
Book or Chapter or Journal Article