

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

Guidelines for risk management in forest planning — what is risk and when is risk management useful?

www.nrfirescience.org/resource/17158

Managing forest resources occurs under various sources of uncertainty. Depending on the management problem, this uncertainty may have a substantial impact on the quality of the solution. As our knowledge on the sources and magnitude of uncertainty improves, integrating this knowledge into the development of management plans becomes...

Author(s): Kyle Eyvindson, Annika Kangas

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

A model-based framework to evaluate alternative wildfire suppression strategies

www.nrfirescience.org/resource/16478

The complexity and demands of wildland firefighting in the western U.S. have increased over recent decades due to factors including the expansion of the wildland-urban interface, lengthening fire seasons associated with climate change, and changes in vegetation due to past fire suppression and timber harvest. In light of these...

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

How does information affect fire risk reduction behaviors? Mediating effects of cognitive processes and subjective knowledge

www.nrfirescience.org/resource/17341

Communicating risk information is crucial in policy making regarding hazardous events. The influencing mechanism of risk information in generating behavioral reactions is considered in the context of fire risk. We investigate homeowners' responses to risk information and how their cognitive processes influence their risk reduction...

Author(s): Tianzhuo Liu, Huifang Jiao

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Interacting effects of topography, vegetation, human activities and wildland-urban interfaces on wildfire ignition risk

www.nrfirescience.org/resource/16679

Effective fire prevention requires a better understanding of the patterns and causes of fire ignition. In

this study, we focus on the interacting factors known to influence fire ignition risk, such as the type of vegetation, topographical features and the wildland-urban interface (WUI; i.e. where urban development meet or...

Author(s): María Calviño-Cancela, María L. Chas-Amil, Eduardo D. García-Martínez, Julia Touza

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Natural hazard modeling and uncertainty analysis [Chapter 2]

www.nrfirescience.org/resource/16564

Modeling can play a critical role in assessing and mitigating risks posed by natural hazards. These modeling efforts generally aim to characterize the occurrence, intensity, and potential consequences of natural hazards. Uncertainties surrounding the modeling process can have important implications for the development, application,...

Author(s): Matthew P. Thompson, Jord J. Warmink

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Uncertainty in natural hazards: modeling and decision support (Introduction)

www.nrfirescience.org/resource/16149

Uncertainties are pervasive in natural hazards, and it is crucial to develop robust and meaningful approaches to characterize and communicate uncertainties to inform modeling efforts. In this monograph we provide a broad, cross-disciplinary overview of issues relating to uncertainties faced in natural hazard and risk assessment. We...

Author(s): Karen L. Riley, Matthew P. Thompson, Peter Webley, Kevin D. Hyde

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Whither the paradigm shift? Large wildland fires and the wildfire paradox offer opportunities for a new paradigm of ecological fire management

www.nrfirescience.org/resource/15487

The growing frequency of large wildland fires has raised awareness of the 'wildfire paradox' and the 'firefighting trap' that are both rooted in the fire exclusion paradigm. However, a paradigm shift has been unfolding in the wildland fire community that seeks to restore fire ecology processes across broad landscapes. This...

Author(s): Timothy Ingalsbee

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

Natural hazard modeling and uncertainty analysis (Chapter 2)

www.nrfirescience.org/resource/16147

Modeling can play a critical role in assessing and mitigating risks posed by natural hazards. These modeling efforts generally aim to characterize the occurrence, intensity, and potential consequences of natural hazards. Uncertainties surrounding the modeling process can have important implications for the development, application,...

Author(s): Matthew P. Thompson, Jord J. Warmink

Year Published: 2017

Type: Document
Book or Chapter or Journal Article

A framework for developing safe and effective large-fire response in a new fire management paradigm

www.nrfirescience.org/resource/16144

The impacts of wildfires have increased in recent decades because of historical forest and fire management, a rapidly changing climate, and an increasingly populated wildland urban interface. This increasingly complex fire environment highlights the importance of developing robust tools to support risk-informed decision making....

Author(s): Christopher J. Dunn, Matthew P. Thompson, David E. Calkin

Year Published: 2017

Type: Document
Book or Chapter or Journal Article

Risk aversion and risk seeking in multicriteria forest management: a Markov decision process approach

www.nrfirescience.org/resource/16448

Markov decision process models were extended to reflect some consequences of the risk attitude of forestry decision makers. One approach consisted of maximizing the expected value of a criterion subject to an upper bound on the variance or, symmetrically, minimizing the variance subject to a lower bound on the expected value. The...

Author(s): Joseph Buongiorno, Mo Zhou, Craig Johnston

Year Published: 2017

Type: Document
Book or Chapter or Journal Article

Evaluating spatiotemporal tradeoffs under alternative fuel management and suppression policies: measuring returns on investment - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/16996

The primary theme of our study is the cost-effectiveness of fuel treatment at multiple scales, addressing the question of whether fuel treatments can be justified on the basis of saved suppression costs. Our study was designed to track the influence of a dollar invested in fuel treatments on final fire outcomes, and to quantify this...

Author(s): Matthew P. Thompson, Karen L. Riley, Dan R. Loeffler, Jessica R. Haas

Year Published: 2017

Type: Document
Technical Report or White Paper

Uncertainty in natural hazards, modeling and decision support: An introduction to this volume [Chapter 1]

www.nrfirescience.org/resource/16565

Given the expanding vulnerability of human populations and natural systems, management professionals are ever more frequently called upon to apply natural hazard modeling in decision support. When scientists enter into predictive services, they share professional, moral, legal, and ethical responsibilities to account for the...

Author(s): Karen L. Riley, Matthew P. Thompson, Peter Webley, Kevin D. Hyde

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

A spatial evaluation of global wildfire-water risks to human and natural systems

www.nrfirescience.org/resource/16561

The large mediatic coverage of recent massive wildfires across the world has emphasized the vulnerability of freshwater resources. The extensive hydrogeomorphic effects from a wildfire can impair the ability of watersheds to provide safe drinking water to downstream communities and high-quality water to maintain riverine ecosystem...

Author(s): Francois-Nicolas Robinne, Kevin D. Bladon, Carol Miller, Marc-Andre Parisien, Jerome Mathieu, Michael D. Flannigan

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Systems thinking and wildland fire management

www.nrfirescience.org/resource/16148

A changing climate, changing development and land use patterns, and increasing pressures on ecosystem services raise global concerns over growing losses associated with wildland fires. New management paradigms acknowledge that fire is inevitable and often uncontrollable, and focus on living with fire rather than attempting to...

Author(s): Matthew P. Thompson, Christopher J. Dunn, David E. Calkin

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Mapping the future: U.S. exposure to multiple landscape stressors

www.nrfirescience.org/resource/15285

Landscape exposure to multiple stressors can pose risks to human health, biodiversity, and ecosystem services. Attempts to study, control, or mitigate these stressors can strain public and private budgets. An interdisciplinary team of Pacific Northwest Research Station and Oregon State University scientists created maps of the...

Author(s): Marie Oliver, Becky K. Kerns, John Kim, Jeffrey D. Kline

Year Published: 2017

Type: Document

Technical Report or White Paper

Network analysis of wildfire transmission and implications for risk governance

www.nrfirescience.org/resource/16507

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

land tenures and communities and...

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

A review of challenges to determining and demonstrating efficiency of large fire management

www.nrfirescience.org/resource/16145

Characterizing the impacts of wildland fire and fire suppression is critical information for fire management decision-making. Here, we focus on decisions related to the rare larger and longer-duration fire events, where the scope and scale of decision-making can be far broader than initial response efforts, and where determining and...

Author(s): Matthew P. Thompson, Francisco Rodriguez y Silva, David E. Calkin, Michael S. Hand

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Uncertainty and probability in wildfire management decision support: An example from the United States [Chapter 4]

www.nrfirescience.org/resource/14998

Wildfire risk assessment is increasingly being adopted to support federal wildfire management decisions in the United States. Existing decision support systems, specifically the Wildland Fire Decision Support System (WFDSS), provide a rich set of probabilistic and risk-based information to support the management of active wildfire...

Author(s): Matthew P. Thompson, David E. Calkin, Joe H. Scott, Michael S. Hand

Year Published: 2017

Type: Document

Technical Report or White Paper

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

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

Wildfire risk as a socioecological pathology

www.nrfirescience.org/resource/14461

Wildfire risk in temperate forests has become a nearly intractable problem that can be characterized as a socioecological 'pathology': that is, a set of complex and problematic interactions among social and ecological systems across multiple spatial and temporal scales. Assessments of wildfire risk could benefit from recognizing and...

Author(s): A. Paige Fischer, Thomas A. Spies, Toddi A. Steelman, Cassandra Moseley, Bart R. Johnson, John D. Bailey, Alan A. Ager, Patrick S. Bourgeron, Susan Charnley, Brandon M. Collins, Jeffrey D. Kline, Jessica E. Leahy, Jeremy S. Littell, James D.A. Millington, Max W. Nielsen-Pincus, Christine Olsen, Travis B. Paveglio, Christopher I. Roos, David M. J. S. Bowman

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Risk terminology primer: basic principles and a glossary for the wildland fire management community

www.nrfirescience.org/resource/14409

Risk management is being increasingly promoted as an appropriate method for addressing wildland fire management challenges. However, a lack of a common understanding of risk concepts and terminology is hindering effective application. In response, this General Technical Report provides a set of clear, consistent, understandable, and...

Author(s): Matthew P. Thompson, Tom Zimmerman, Dan Mindar, Mary A. Taber

Year Published: 2016

Type: Document

Technical Report or White Paper

Application of wildfire risk assessment results to wildfire response planning in the southern Sierra Nevada, California, USA

www.nrfirescience.org/resource/14351

How wildfires are managed is a key determinant of long-term socioecological resiliency and the ability to live with fire. Safe and effective response to fire requires effective pre-fire planning, which is the main focus of this paper. We review general principles of effective federal fire management planning in the U.S., and...

Author(s): Matthew P. Thompson, Phil Bowden, April Brough, Julie W. Gilbertson-Day, Alan H. Taylor, Jessica R. Haas

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Using risk analysis to reveal opportunities for the management of unplanned ignitions in wilderness

www.nrfirescience.org/resource/16049

A goal of fire management in wilderness is to allow fire to play its natural ecological role without intervention. Unfortunately, most unplanned ignitions in wilderness are suppressed, in part because of the risk they might pose to values, outside of the wilderness. We capitalize on recent advances in fire risk analysis to...

Author(s): Kevin M. Barnett, Carol Miller, Tyron J. Venn

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

Uncertainty is information, too

www.nrfirescience.org/resource/16151

How accounting for doubt helps inform decision making.

Author(s): Bruce G. Marcot, Matthew P. Thompson, Thomas W. Bonnot, Frank R. Thompson

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Risk management: core principles and practices, and their relevance to wildland fire

www.nrfirescience.org/resource/14411

The Forest Service, U.S. Department of Agriculture faces a future of increasing complexity and risk, pressing financial issues, and the inescapable possibility of loss of human life. These issues are perhaps most acute for wildland fire management, the highest risk activity in which the Forest Service engages. Risk management (RM)...

Author(s): Matthew P. Thompson, Donald G. MacGregor, David E. Calkin

Year Published: 2016

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/14352

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

Risk Perception, Sensemaking and Resilient Performance: The Sounds of Wildland Firefighting in Action - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/17046

Managing wildland fire is an exercise in risk perception, sensemaking and resilient performance. Risk

perception begins with individual size up of a wildfire to determine a course of action, and then becomes collective as the fire management team builds and continuously updates their common perception of risk. Karl Weick has called...

Author(s): Anne E. Black, David Thomas, Jennifer Ziegler, Elena Gabor, Rebekah L. Fox

Year Published: 2016

Type: Document

Technical Report or White Paper

Emerging concepts in wildfire risk assessment and management

www.nrfirescience.org/resource/13948

A quantitative measure of wildfire risk across a landscape-expected net change in value of resources and assets exposed to wildfire-was established nearly a decade ago. Assessments made using that measure have been completed at spatial extents ranging from an individual county to the continental United States. The science of...

Author(s): Joe H. Scott, Matthew P. Thompson

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Wildfires: systemic changes required

www.nrfirescience.org/resource/16155

There needs to be a deeper, systems-level understanding of the fire management system. The behavior of fire managers is a direct and logical result of the structure of the system in which they operate, influenced by factors such as incentives, culture, and capacity. If managers are judged by fire exclusion, that will become the...

Author(s): Matthew P. Thompson, Christopher J. Dunn, David E. Calkin

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Integrating pixel- and polygon-based approaches to wildfire risk assessment: application to a high-value watershed on the Pike and San Isabel National Forests, Colorado, USA

www.nrfirescience.org/resource/16153

We develop a novel risk assessment approach that integrates complementary, yet distinct, spatial modeling approaches currently used in wildfire risk assessment. Motivation for this work stems largely from limitations of existing stochastic wildfire simulation systems, which can generate pixel-based outputs of fire behavior as well...

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Development and application of a geospatial wildfire exposure and risk calculation tool

www.nrfirescience.org/resource/13271

Applying wildfire risk assessment models can inform investments in loss mitigation and landscape restoration, and can be used to monitor spatiotemporal trends in risk. Assessing wildfire risk entails the integration of fire modeling outputs, maps of highly valued resources and assets (HVRAs), characterization of fire effects, and...

Author(s): Matthew P. Thompson, Jessica R. Haas, Julie W. Gilbertson-Day, Joe H. Scott, Paul G. Langowski, Elise M. Bowne, David E. Calkin

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Development and application of a probabilistic method for wildfire suppression cost modeling

www.nrfirescience.org/resource/12762

Wildfire activity and escalating suppression costs continue to threaten the financial health of federal land management agencies. In order to minimize and effectively manage the cost of financial risk, agencies need the ability to quantify that risk. A fundamental aim of this research effort, therefore, is to develop a process for...

Author(s): Matthew P. Thompson, Jessica R. Haas, Mark A. Finney, David E. Calkin, Michael S. Hand, Mark J. Browne, Martin Halek, Karen C. Short, Isaac C. Grenfell

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Risk preferences, probability weighting, and strategy tradeoffs in wildfire management

www.nrfirescience.org/resource/16154

Wildfires present a complex applied risk management environment, but relatively little attention has been paid to behavioral and cognitive responses to risk among public agency wildfire managers. This study investigates responses to risk, including probability weighting and risk aversion, in a wildfire management context using a...

Author(s): Michael S. Hand, Matthew J. Wibbenmeyer, David E. Calkin, Matthew P. Thompson

Year Published: 2015

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

Wildfire risk transmission in the Colorado Front Range, USA

www.nrfirescience.org/resource/16162

Wildfires are a global phenomenon that in some circumstances can result in human casualties, economic loss, and ecosystem service degradation. In this article we spatially identify wildfire risk transmission pathways and locate the areas of highest exposure of human populations to wildland fires under severe, but not uncommon,...

Author(s): Jessica R. Haas, David E. Calkin, Matthew P. Thompson

Year Published: 2014

Type: Document
Book or Chapter or Journal Article

Understanding stochastic wildfire simulation results

www.nrfirescience.org/resource/12758

Stochastic simulations of wildfire occurrence and growth have become an integral part of both wildfire incident management and land management planning applications. The FSPro simulation system, implemented in the online Wildland Fire Decision Support System (WFDSS), acknowledges that weather inputs to wildfire growth...

Author(s): Joe H. Scott

Year Published: 2014

Type: Document

Technical Report or White Paper

Developing an aviation exposure index to inform risk-based fire management decisions

www.nrfirescience.org/resource/16159

Wildland firefighting is an inherently dangerous activity, and aviation-related accidents in particular comprise a large share of firefighter fatalities. Due to limited understanding of operational factors that lead to aviation accidents, it is unclear how local decisionmakers, responsible for requesting aviation support, can...

Author(s): Crystal S. Stonesifer, David E. Calkin, Matthew P. Thompson, Jeffrey D. Kaiden

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

The shape of ecosystem management to come: Anticipating risks and fostering resilience

www.nrfirescience.org/resource/16831

Global change is increasingly challenging the sustainable provisioning of ecosystem services to society. Addressing future uncertainty and risk has therefore become a central problem of ecosystem management. With risk management and resilience-based stewardship, two contrasting approaches have been proposed to address this issue....

Author(s): Rupert Seidl

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Post-epidemic fire risk and behavior

www.nrfirescience.org/resource/13708

Citizens, government officials, and natural resource managers are greatly concerned about potential impacts of the mountain pine beetle (MPB) epidemic on fire hazards and risk. Some mountain towns are surrounded by dead and dying trees. In the Rocky Mountain Region of the Forest Service, the MPB epidemic threatens over 250,000 acres...

Author(s): Russell A. Parsons, William Matt Jolly, Paul G. Langowski, Megan Matonis, I. Sue Miller

Year Published: 2014

Type: Document

Conference Proceedings

Social, institutional, and psychological factors wildfire incident decision making

www.nrfirescience.org/resource/16136

Managing wildland fire incidents can be fraught with complexity and uncertainty. Myriad human factors can exert significant influence on incident decision making, and can contribute additional uncertainty regarding programmatic evaluations of wildfire management and attainment of policy goals. This article develops a framework...

Author(s): Matthew P. Thompson

Year Published: 2014
Type: Document
Book or Chapter or Journal Article

Assessing the expected effects of wildfire on vegetation condition on the Bridger-Teton National Forest, Wyoming, USA

www.nrfirescience.org/resource/12759

Characterizing wildfire risk to a fire-adapted ecosystem presents particular challenges due to its broad spatial extent, inherent complexity, and the difficulty in defining wildfire-induced losses and benefits. Our approach couples stochastic wildfire simulation with a vegetation condition assessment framework to estimate the...

Author(s): Joe H. Scott, Don Helmbrecht, Matthew P. Thompson

Year Published: 2014

Type: Document

Technical Report or White Paper

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

Risk preferences in strategic wildfire decision making: a choice experiment with U.S. wildfire managers

www.nrfirescience.org/resource/12752

Federal policy has embraced risk management as an appropriate paradigm for wildfire management. Economic theory suggests that over repeated wildfire events, potential economic costs and risks of ecological damage are optimally balanced when management decisions are free from biases, risk aversion, and risk seeking. Of primary...

Author(s): Matthew J. Wibbenmeyer, Michael S. Hand, David E. Calkin, Tyron J. Venn, Matthew P. Thompson

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Decision making for wildfires: a guide for applying a risk management process at the incident level

www.nrfirescience.org/resource/12748

This publication focuses on the thought processes and considerations surrounding a risk management process for decision making on wildfires. The publication introduces a six element risk management cycle designed to encourage sound risk-informed decision making in accordance with Federal wildland fire policy, although the process is...

Author(s): Mary A. Taber, Lisa M. Elenz, Paul G. Langowski

Year Published: 2013

Type: Document

Technical Report or White Paper

Escape probability: an alternative risk metric to support and evaluate wilderness fire management decisions

www.nrfirescience.org/resource/13478

A goal of fire management in wilderness is to allow fire to play its natural ecological role without intervention. Unfortunately, most unplanned ignitions in wilderness are suppressed, in part because of the risk they might pose to values outside of the wilderness. Although the fire management community has embraced the concept of...

Author(s): Kevin M. Barnett

Year Published: 2013

Type: Document

Dissertation or Thesis

Research and development supporting risk-based wildfire effects prediction for fuels and fire management: status and needs

www.nrfirescience.org/resource/12743

Wildland fire management has moved beyond a singular focus on suppression, calling for wildfire management for ecological benefit where no critical human assets are at risk. Processes causing direct effects and indirect, long-term ecosystem changes are complex and multidimensional. Robust risk-assessment tools are required that...

Author(s): Kevin D. Hyde, Matthew B. Dickinson, Gil Bohrer, David E. Calkin, Louisa Evers, Julie W. Gilbertson-Day, Tessa Nicolet, Kevin C. Ryan, Christina Tague

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

Characterizing wildfire hazard and risk in mountain pine beetle-affected stands and how to identify those characteristics at the landscape-scale

www.nrfirescience.org/resource/11977

The transformation of fuels resulting from the mountain pine beetle epidemic is unprecedented in its large geographic extent and the rapid pace of the transformation. This paper describes a proposed fire risk and hazard characterization system, as well as methodology for locating certain stand types on the landscape.

Author(s): Robert W. Gray

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Modeling wildfire incident complexity dynamics

www.nrfirescience.org/resource/16137

Wildfire management in the United States and elsewhere is challenged by substantial uncertainty regarding the location and timing of fire events, the socioeconomic and ecological consequences of these events, and the costs of suppression. Escalating U.S. Forest Service suppression expenditures is of particular concern at a time of...

Author(s): Matthew P. Thompson

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Hazardous fuel treatments, suppression cost impacts, and risk mitigation

www.nrfirescience.org/resource/16170

Land management agencies face uncertain tradeoffs regarding investments in preparedness and fuels management versus future suppression costs and impacts to valued resources and assets. Prospective evaluation of fuel treatments allows for comparison of alternative treatment strategies in terms of socioeconomic and ecological impacts...

Author(s): Matthew P. Thompson, Michael S. Hand, Julie W. Gilbertson-Day, Nicole M. Vaillant, Derek J. Nalle

Year Published: 2013

Type: Document

Conference Proceedings

Best practices in risk and crisis communication: implications for natural hazards management

www.nrfirescience.org/resource/8359

As societies evolve, often the most appropriate response to the hazard must also evolve. However, such shifts in appropriate response to a hazard, whether at the individual or at the societal level, are rarely straightforward: Closing the gap between desired practice and current practice requires effective communication. Although...

Author(s): Toddi A. Steelman, Sarah M. McCaffrey

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Analyzing the transmission of wildfire exposure on a fire-prone landscape in Oregon, USA

www.nrfirescience.org/resource/12755

We develop the idea of risk transmission from large wildfires and apply network analyses to understand its importance on a 0.75 million ha US national forest. Wildfires in the western US frequently burn over long distances (e.g., 20-50 km) through highly fragmented landscapes with respect to ownership, fuels, management intensity,...

Author(s): Alan A. Ager, Michelle A. Day, Mark A. Finney, Ken W. Vance-Borland, Nicole M. Vaillant

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Integrated wildfire risk assessment: framework development and application on the Lewis and Clark National Forest in Montana, USA

www.nrfirescience.org/resource/12751

The financial, socioeconomic, and ecological impacts of wildfire continue to challenge federal land management agencies in the United States. In recent years, policymakers and managers have increasingly turned to the field of risk analysis to better manage wildfires and to mitigate losses to highly

valued resources and...

Author(s): Matthew P. Thompson, Joe H. Scott, Don Helmbrecht, David E. Calkin

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

A wildfire risk assessment framework for land and resource management

www.nrfirescience.org/resource/12445

Wildfires can result in significant, long-lasting impacts to ecological, social, and economic systems. It is necessary, therefore, to identify and understand the risks posed by wildland fire, and to develop cost-effective mitigation strategies accordingly. This report presents a general framework with which to assess wildfire risk...

Author(s): Joe H. Scott, Matthew P. Thompson, David E. Calkin

Year Published: 2013

Type: Document

Technical Report or White Paper

Response of highly valued resources and assets to wildfire within Grand Teton National Park and Bridger-Teton National Forest

www.nrfirescience.org/resource/12744

Grand Teton National Park (GTNP) and the Bridger-Teton National Forest (BTNF) cover approximately 3.7 million acres within the Greater Yellowstone Ecosystem. The majority of this land base is fairly remote, much of it either designated Wilderness or roadless, and composed of fire-adapted ecosystems. To add complexity to the fire...

Author(s): Joe H. Scott, Don Helmbrecht, Martha A. Williamson

Year Published: 2013

Type: Document

Technical Report or White Paper

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

A polygon-based modeling approach to assess exposure of resources and assets to wildfire

www.nrfirescience.org/resource/12048

Spatially explicit burn probability modeling is increasingly applied to assess wildfire risk and inform mitigation strategy development. Burn probabilities are typically expressed on a per-pixel basis, calculated as the number of times a pixel burns divided by the number of simulation iterations. Spatial intersection of highly...

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Appendix 2: Risk-based framework and risk case studies. Risk assessment for wildfire in the Western United States

www.nrfirescience.org/resource/11903

Wildfire is one of the two most significant disturbance agents (the other being insects) in forest ecosystems of the Western United States, and in a warmer climate, will drive changes in forest composition, structure, and function (Dale et al. 2001, McKenzie et al. 2004). Although wildfire is highly stochastic in space and time,...

Author(s): David L. Peterson, Jeremy S. Littell

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

Quantifying the potential impacts of fuel treatments on wildfire suppression costs

www.nrfirescience.org/resource/16138

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

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

The science and opportunity of wildfire risk assessment (Chapter 6)

www.nrfirescience.org/resource/16179

Wildfire management within the United States continues to increase in complexity, as the converging drivers of (1) increased development into fire-prone areas, (2) accumulated fuels from historic management practices, and (3) climate change potentially magnify threats to social and ecological values (Bruins et al., 2010; Gude et al. ...)

Author(s): Matthew P. Thompson, Alan A. Ager, Mark A. Finney, David E. Calkin, Nicole M. Vaillant

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Estimating US federal wildland fire managers' preferences toward competing strategic suppression objectives

www.nrfirescience.org/resource/16174

Wildfire management involves significant complexity and uncertainty, requiring simultaneous consideration of multiple, non-commensurate objectives. This paper investigates the tradeoffs fire managers are willing to make among these objectives using a choice experiment methodology that provides three key advancements relative to...

Author(s): David E. Calkin, Tyron J. Venn, Matthew J. Wibbenmeyer, Matthew P. Thompson

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Wildfire triage: targeting mitigation based on social, economic, and ecological values

www.nrfirescience.org/resource/16178

Evaluating the risks of wildfire relative to the valuable resources found in any managed landscape requires an interdisciplinary approach. Researchers at the Rocky Mountain Research Station and Western Wildland Threat Assessment Center developed such a process, using a combination of techniques rooted in fire modeling and ecology,...

Author(s): Karl Malcolm, Matthew P. Thompson, David E. Calkin, Mark A. Finney, Alan A. Ager

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

Risk complexity and the wildland firefighter

www.nrfirescience.org/resource/16402

Between 2000 and 2010 the US Forest Service and the Department of the Interior experienced 82 wildland fire fatalities. Our most recent organizational focus has been to eliminate fatalities. The chief of the USFS, in a letter to all employees, asked us to "suspend disbelief" with regard to the concept of a "zero fatality..."

Author(s): Ivan Pupilidy

Year Published: 2012

Type: Document

Conference Proceedings

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

Uncertainty and risk in wildland fire management: a review

www.nrfirescience.org/resource/12431

Wildland fire management is subject to manifold sources of uncertainty. Beyond the unpredictability of wildfire behavior, uncertainty stems from inaccurate/missing data, limited resource value measures to guide prioritization across fires and resources at risk, and an incomplete scientific understanding of ecological response to...

Author(s): Matthew P. Thompson, David E. Calkin

Year Published: 2011

Type: Document
Book or Chapter or Journal Article, Synthesis

The exposure index: developing firefighter safety performance measures

www.nrfirescience.org/resource/16182

A cornerstone of effective institutional learning and accountability is the development, tracking, and analysis of informative performance measures. In a previous issue of Fire Management Today ("A New Look at Risk Management," Winter 2011), a series of articles highlighted the importance of organizational safety and risk management...

Author(s): David E. Calkin, John Phipps, Thomas P. Holmes, Jon D. Rieck, Matthew P. Thompson
Year Published: 2011

Type: Document
Book or Chapter or Journal Article

Integrated national-scale assessment of wildfire risk to human and ecological values

www.nrfirescience.org/resource/12735

The spatial, temporal, and social dimensions of wildfire risk are challenging U.S. federal land management agencies to meet societal needs while maintaining the health of the lands they manage. In this paper we present a quantitative, geospatial wildfire risk assessment tool, developed in response to demands for improved risk-based...

Author(s): Matthew P. Thompson, David E. Calkin, Mark A. Finney, Alan A. Ager, Julie W. Gilbertson-Day

Year Published: 2011

Type: Document
Book or Chapter or Journal Article

A method for ensemble wildland fire simulation

www.nrfirescience.org/resource/12732

An ensemble simulation system that accounts for uncertainty in long-range weather conditions and two-dimensional wildland fire spread is described. Fuel moisture is expressed based on the energy release component, a US fire danger rating index, and its variation throughout the fire season is modeled using time series analysis of...

Author(s): Mark A. Finney, Isaac C. Grenfell, Charles W. McHugh, Robert C. Seli, D. Trethewey, Richard D. Stratton, Stuart Brittain

Year Published: 2011

Type: Document
Book or Chapter or Journal Article

A comparative risk assessment framework for wildland fire management: the 2010 cohesive strategy science report

www.nrfirescience.org/resource/12728

The FLAME Act of 2009 requires the U.S. Department of Agriculture Forest Service and the U.S. Department of Interior to submit to Congress a Cohesive Wildfire Management Strategy. In this report, we explore the general science available for a risk-based approach to fire and fuels management and suggest analyses that may be applied...

Year Published: 2011

Type: Document
Technical Report or White Paper

Progress towards and barriers to implementation of a risk framework for US federal wildland fire

policy and decision making

www.nrfirescience.org/resource/16180

In this paper we review progress towards the implementation of a riskmanagement framework for US federal wildland fire policy and operations. We first describe new developments in wildfire simulation technology that catalyzed the development of risk-based decision support systems for strategic wildfire management. These systems...

Author(s): David E. Calkin, Mark A. Finney, Alan A. Ager, Matthew P. Thompson, Krista M. Gebert

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

A simulation of probabilistic wildfire risk components for the continental United States

www.nrfirescience.org/resource/12734

This simulation research was conducted in order to develop a large-fire risk assessment system for the contiguous land area of the United States. The modeling system was applied to each of 134 Fire Planning Units (FPUs) to estimate burn probabilities and fire size distributions. To obtain stable estimates of these quantities, fire...

Author(s): Mark A. Finney, Charles W. McHugh, Isaac C. Grenfell, Karen L. Riley, Karen C. Short

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Advancing effects analysis for integrated, large-scale wildfire risk assessment

www.nrfirescience.org/resource/12729

In this article, we describe the design and development of a quantitative, geospatial risk assessment tool intended to facilitate monitoring trends in wildfire risk over time and to provide information useful in prioritizing fuels treatments and mitigation measures. The research effort is designed to develop, from a strategic view,...

Author(s): Matthew P. Thompson, David E. Calkin, Julie W. Gilbertson-Day, Alan A. Ager

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

A real-time risk assessment tool supporting wildland fire decisionmaking

www.nrfirescience.org/resource/12727

Development of appropriate management strategies for escaped wildland fires is complex. Fire managers need the ability to identify, in real time, the likelihood that wildfire will affect valuable developed and natural resources (e.g., private structures, public infrastructure, and natural and cultural resources). These...

Author(s): David E. Calkin, Matthew P. Thompson, Mark A. Finney, Kevin D. Hyde

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

The Key Decision Log: facilitating high reliability and organizational learning

www.nrfirescience.org/resource/16399

If you were involved in the 2008 fire season in the West, you may have heard the term "Key Decision Log" or "KDL." This article describes the KDL concept, it's intent (past and present), how it was applied in 2008, and where the practice is heading.

Author(s): Anne E. Black

Year Published: 2009

Type: Document
Book or Chapter or Journal Article

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

Managing the unexpected: resilient performance in an age of uncertainty

www.nrfirescience.org/resource/15972

Thousands of firefighters across the United States have been influenced by the first edition of "Managing the Unexpected". In this second edition, the authors continue their analysis of high reliability organizations (HRO's), which are organizations that routinely operate in high risk environments (where the consequences of...

Author(s): Karl E. Weick, Kathleen Sutcliffe

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

The next catastrophe: reducing our vulnerabilities to natural, industrial, and terrorist disasters

www.nrfirescience.org/resource/15885

Perrow, developer of normal accident theory, argues here that we must reduce the size of targets that are vulnerable to disasters because organizations, including political ones, cannot completely prevent all the risks associated with the potential disasters that a society might face. A basic tenant of Perrow's argument is that...

Author(s): Charles Perrow

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Windwizard: a new tool for fire management decision support

www.nrfirescience.org/resource/16902

A new software tool has been developed to simulate surface wind speed and direction at the 100m to 300 m scale. This tool is useful when trying to estimate fire behavior in mountainous terrain. It is based on widely used computational fluid dynamics technology and has been tested against measured wind flows. In recent years it has...

Author(s): Bret W. Butler, Mark A. Finney, Larry S. Bradshaw, Jason M. Forthofer, Charles W. McHugh, Rick Stratton, Daniel M. Jimenez

Year Published: 2006

Type: Document

Conference Proceedings

The challenge of quantitative risk analysis for wildland fire

www.nrfirescience.org/resource/12715

Quantitative fire risk analysis depends on characterizing and combining fire behavior probabilities and effects. Fire behavior probabilities are different from fire occurrence statistics (historic numbers or probabilities of discovered ignitions) because they depend on spatial and temporal factors controlling fire growth. That is,...

Author(s): Mark A. Finney

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Accepting uncertainty, assessing risk: decision quality in managing wildfire, forest resource values, and new technology

www.nrfirescience.org/resource/12711

The risks, uncertainties, and social conflicts surrounding uncharacteristic wildfire and forest resource values have defied conventional approaches to planning and decision-making. Paradoxically, the adoption of technological innovations such as risk assessment, decision analysis, and landscape simulation models by land management...

Author(s): Jeffrey G. Borchers

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Shared mindfulness in cockpit crisis situations

www.nrfirescience.org/resource/15912

Research reveals that human error contributes 60 to 80 percent of error in aviation accidents and disasters. Thus, despite innovations in technology and safety materials, individuals must be able to make speedy yet intelligent decisions and be able to communicate those decisions in an efficient manner. Krieger explores the...

Author(s): Janice L. Krieger

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Wildland fire hazard and risk: problems, definitions and context

www.nrfirescience.org/resource/12716

The risks, hazards, and relative severity of wildland fires are presented here within the ecological context of historical natural fire regimes, time, space, and process. As the public dialogue on the role and impacts of wildland fire increases, it is imperative for all partners to converge on clear and concise terminology that...

Author(s): Colin C. Hardy

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

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

On becoming an artist: reinventing yourself through mindful creativity

www.nrfirescience.org/resource/15831

In this book, Langer augments her previous work on mindfulness and artistic nature with insights on creativity. Langer discusses how creativity is not a rare trait, but a part of every person's makeup. While all people have the ability to express themselves creatively, many people undervalue themselves, which serves to undermine...

Author(s): Ellen J. Langer

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Private and tribal forest landowners and fire risk: a two-county case study in Washington state

www.nrfirescience.org/resource/16114

This study focused on the role of fire both as a perceived threat and a management tool of nonindustrial private forest and tribal forest landowners or managers in two counties in northeastern Washington State. Using qualitative social research methods and a risk perception conceptual frame, we identified distinct categories of...

Author(s): Matthew S. Carroll, Patricia J. Cohn, Keith A. Blatner

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Surviving the age of risk: a call for ethical management

www.nrfirescience.org/resource/15903

Ewing and Lee look at some of the ways to consider ethical risk management in a corporate context, which have changed because of recent scandals such as Enron. They give six ways to create an ethical risk management environment (the six Cs): 1) Champions: find a spokesperson, someone to "champion" risk management; 2) Commitment...

Author(s): Lance J. Ewing, Ryan B. Lee

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Probability based models for estimation of wildfire risk

www.nrfirescience.org/resource/12709

We present a probability-based model for estimating fire risk. Risk is defined using three probabilities: the probability of fire occurrence; the conditional probability of a large fire given ignition; and the unconditional probability of a large fire. The model is based on grouped data at the 1 km²-day cell level. We fit a...

Author(s): Haiganoush K. Preisler, David R. Brillinger, Robert E. Burgan, John W. Benoit

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

A new accident model for engineering safer systems

www.nrfirescience.org/resource/15959

Leveson argues that most accident models are designed for simple systems. Newer accident models are needed because of the changing landscape of organizational systems and the changing contexts in which they are developed. Fast-paced technological change, new types of digital failure and hazards, decreasing tolerance for failure, and...

Author(s): Nancy Leveson

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Training ecologists to think with uncertainty in mind

www.nrfirescience.org/resource/12642

Predictive capacity is needed to anticipate the consequences of global change. Along with the computational challenges inherent in accounting for uncertainty in models of ecological and physical processes related to global change, we face educational challenges related to developing the intellectual capital for thinking with...

Author(s): Carol A. Brewer, Louis J. Gross

Year Published: 2003

Type: Document

Book or Chapter or Journal Article, Synthesis

The spatial context of fire: a new approach for predicting fire occurrence

www.nrfirescience.org/resource/10993

Across North America, decades of fire suppression and recent patterns of human settlement have combined to increase the risks that wildland fires pose to human life, property, and natural resource values. Various methods can be used to reduce fuel hazards and mitigate these risks, but funding and other constraints require that these...

Author(s): Carol Miller

Year Published: 2003

Type: Document

Conference Proceedings, Technical Report or White Paper

Risk as analysis and risk as feelings: some thoughts about affect, reason, risk, and rationality

www.nrfirescience.org/resource/15963

Risk assessment is often viewed as a logical, cause-effect process that uses mathematics and gives little credence to feelings. Without discounting the need for a rational approach to categorizing risk analysis, the authors show how affect, feelings, and emotions (the perceived "goodness" and the "badness" of a risky...

Author(s): Paul Slovic, Melissa Finucane, Ellen Peters, Donald G. MacGregor

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

Inviting disaster: lessons from the edge of technology

www.nrfirescience.org/resource/15873

While technology has provided the means for achieving unprecedented control over land, air, and sea, it has also become increasingly complex. As a result of this complexity, disasters are difficult to predict, and they are even more difficult to prevent. This book exposes many common mistakes that have culminated in unnecessary...

Author(s): James R. Chiles

Year Published: 2002
Type: Document
Book or Chapter or Journal Article

Decisions: making the right ones. Learning from the wrong ones.

www.nrfirescience.org/resource/16230

This article critiques two predominant forms of decision making: rational-choice and the intuitive approach. The authors suggest a more productive approach to decision making is the experiential, or "recognize/react," approach. The experiential approach asserts that experience provides decision makers the ability to size up...

Author(s): Gary Klein, Karl E. Weick
Year Published: 2000
Type: Document
Book or Chapter or Journal Article

Lessons from Longford: the Esso Gas Plant explosion

www.nrfirescience.org/resource/15906

The Esso gas plant explosion of 1998 represents a series of organizational failures that resulted in devastating consequences, including two deaths. This book examines those organizational failures through the findings of the Royal Commission. The author argues that the accident was preventable and was caused by a number of failures...

Author(s): Andrew Hopkins
Year Published: 2000
Type: Document
Book or Chapter or Journal Article

Managing major hazards: the lessons of the Moura Mine disaster

www.nrfirescience.org/resource/15905

In every organization, things go wrong. For the most part, these errors are minor and often go unnoticed. However, when disaster occurs, external pressure often forces the exposure of many of the failures that occur within an organization. Thus, a disaster can offer an opportunity for in-depth analysis of the internal workings of an...

Author(s): Andrew Hopkins
Year Published: 1999
Type: Document
Book or Chapter or Journal Article

Risk management for ecological stewardship

www.nrfirescience.org/resource/15896

This comprehensive chapter documents, from a management perspective, the knowledge base on risk assessments and risk management. The previous chapter in the book is a companion article that provides the scientific foundation for the concepts and terminology used by Cleaves and Haynes. In this chapter, Cleaves and Haynes provide a...

Author(s): D.A. Cleaves, R. W. Haynes
Year Published: 1999
Type: Document
Book or Chapter or Journal Article

Normal accidents: living with high-risk technologies

www.nrfirescience.org/resource/15886

Many of the accidents that organizations face are a result of complex interactions between multiple events and with multiple actors. They cannot be explained as being only one group or individual's "fault". In this book, Perrow investigates the complexity of accidents as events that are inevitable because of the complex...

Author(s): Charles Perrow

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Organizational learning activities in high-hazard industries: the logics underlying self-analysis

www.nrfirescience.org/resource/15818

Carroll begins by discussing how different staff members in an organization know different things about how work is accomplished. For an organization to run properly, these staff members must engage in organizational learning, which means facilitating the development of organizational knowledge by supporting each other and...

Author(s): John S. Carroll

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

Managing the risks of organizational accidents

www.nrfirescience.org/resource/15960

This book focuses on the causes, consequences, and possible means of avoiding organizational accidents. While individual accidents are more frequent and often target the individual for blame, organizational accidents are deep rooted errors in the daily function of organizations that increase the likelihood for disaster. The author...

Author(s): James Reason

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Managing environmental uncertainty with legitimate authority: a comparative analysis of the Mann Gulch and Storm King Mountain Fires

www.nrfirescience.org/resource/15893

Alder recognizes two decisions common to both the Mann Gulch and Storm King Mountain fires that influenced the behavior of firefighters during critical moments: 1) failing to question authority and 2) failing to obey authority. He argues that these failures are based on individual perceptions of legitimate authority. There are four...

Author(s): G. Stoney Alder

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Man-made disasters

www.nrfirescience.org/resource/15889

To understand and avoid future calamities, decision makers must have a more accurate way of understanding past calamities. Most of what we know about calamities comes from eye witness accounts that favor relief efforts and damage reports rather than the specific events that come together initially to form a disaster. This suggests...

Author(s): Barry A. Turner, Nick F. Pidgeon

Year Published: 1997

Type: Document
Book or Chapter or Journal Article

The Challenger launch decision: risky technology, culture, and deviance at NASA

www.nrfirescience.org/resource/16255

In the wake of the explosion of the 1986 space shuttle Challenger, a conventional explanation for the tragedy emerged: the economic strain on NASA caused managers to withhold information about safety violations in order to maintain the launch schedule. In her book, Diane Vaughan contradicts this conventional explanation by providing...

Author(s): Diane Vaughan

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Learning from mistakes is easier said than done: group and organizational influences on the detection and correction of human error

www.nrfirescience.org/resource/15878

Researchers have often studied and discussed errors and accidents within an organizational setting in two ways. The first focuses on the individual, while the second looks at the system in which the individual operates. Edmondson argues for a third perspective, one that looks at both the individual and the system, and specifically...

Author(s): Amy Edmondson

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Sensemaking in organizations

www.nrfirescience.org/resource/16258

Sensemaking is about how people make sense of situations. When faced with problems, people construct meaning. This constructive process plays a key role in the ultimate understanding that is developed. The meaning of a situation is both created and interpreted through sensemaking. Weick lists seven distinguishing characteristics of...

Author(s): Karl E. Weick

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Beyond aviation human factors: safety in high technology systems

www.nrfirescience.org/resource/15883

Aviation human factors investigations have typically blamed individual behavior as the primary cause of serious work accidents. However, this book argues that organizations are responsible for two aspects that contribute to work related accidents: 1) the local working conditions that restrict how workers can behave and 2) the...

Author(s): Daniel E. Maurino, James Reason, Neil Johnston, Rob B. Lee

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Causes of disaster: sloppy management

www.nrfirescience.org/resource/15891

Turner argues that while the best way to avoid disasters is primarily “for managers to establish, to strengthen, and then to assert control,” management control only addresses part of the problem, and there are limitations that affect management in disaster situations. Turner advocates examining three interrelated factors in a...

Author(s): Barry Turner

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

Organizational communication imperatives: lessons of the space program

www.nrfirescience.org/resource/15970

Drawing upon experience working for NASA during the Apollo Missions and his studies of organizational communication, Tompkins illustrates that taking a communication perspective can help with understanding organizational problems. This book takes a narrative approach in which Tompkins discusses his visits to the Marshall Space...

Author(s): Phillip K. Tompkins

Year Published: 1993

Type: Document

Book or Chapter or Journal Article

The textual approach: risk and blame in disaster sensemaking

www.nrfirescience.org/resource/16261

This article investigates responses to a gas pipeline explosion as a means of uncovering the methods that organizations and other participants use to make sense during disaster and to change situations. Sensemaking deals with how organizations and individuals explain or “make sense of” what goes on around them. Gephart is...

Author(s): Robert P. Gephart Jr.

Year Published: 1993

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/11055

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

Author(s): Martin E. Alexander

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

Military misfortunes: the anatomy of failure in war

www.nrfirescience.org/resource/15876

Military misfortunes are complex and involve not only individual failures in judgment or action, but also organizational failures rooted in the values each military organization upholds. This book uses examples from several military battles to highlight the need for military operations and organizations that: 1) learn from past...

Author(s): Eliot A. Cohen, John Gooch

Year Published: 1990

Type: Document
Book or Chapter or Journal Article

Conservatism, efficiency, and the value of life

www.nrfirescience.org/resource/15868

Many organizations are faced with unavoidable dangers that may harm employees during their regular work. However, despite organizational efforts, it is often unrealistic for employees to be responsible for avoiding all possible risk. Employees must get the job done despite the dangers they may face. In this chapter, MacLean and...

Author(s): Douglas MacLean, Claudia Mills

Year Published: 1990

Type: Document

Book or Chapter or Journal Article

Overcoming organizational defenses: facilitating organizational learning

www.nrfirescience.org/resource/15810

Organizations often suffer because workers and managers avoid embarrassment by turning a blind eye toward mistakes. This book focuses on errors that are consciously buried in order to avoid situations that might damage individual reputations. Using examples from businesses across the United States and government errors like the...

Author(s): Chris Argyris

Year Published: 1990

Type: Document

Book or Chapter or Journal Article

On risk communication as interorganizational control: the case of the aviation safety reporting system

www.nrfirescience.org/resource/15969

Focusing on the 1974 Trans World Airlines (TWA) Flight 514 crash, Tompkins discusses the National Transportation Safety Board's (NTSB) investigation of the crash and points to communication between the pilot and controllers and communication between airline organizations as principle contributors to the tragedy. Using this...

Author(s): Phillip K. Tompkins

Year Published: 1990

Type: Document

Book or Chapter or Journal Article

The history and politics of disaster management in the United States

www.nrfirescience.org/resource/15870

This chapter overviews the history of hazard management in the United States, and defines what constitutes a "disaster" by federal standards. Popkin provides a history of federal and state policies and programs established and maintained in the United States since 1803. Despite historic moves to ensure federally funded hazard...

Author(s): Roy S. Popkin

Year Published: 1990

Type: Document

Book or Chapter or Journal Article

Economic efficiency and risk character of fire management programs, northern rocky mountains

www.nrfirescience.org/resource/11218

Economic efficiency and risk have long been considered during the selection of fire management programs and the design of fire management polices. The risk considerations was largely subjective, however, and efficiency has only recently been calculated for selected portions of the fire management program. The highly stochastic...

Author(s): Thomas J. Mills, Frederick W. Bratten

Year Published: 1988

Type: Document

Technical Report or White Paper

Searching for safety

www.nrfirescience.org/resource/15871

Safety and danger are usually seen as opposites that exclude one another in practice. Safety is often seen as the absence of danger, and danger is often seen as the absence of safety. This book, however, argues that the two conditions are unavoidably and unconditionally connected and that continued safety must encourage the...

Author(s): Aaron Wildavsky

Year Published: 1987

Type: Document

Book or Chapter or Journal Article

Judgment under uncertainty: heuristics and biases

www.nrfirescience.org/resource/15910

This is a classic textbook written by three well known authors (Kahneman recently won the Nobel Prize for economics) who have spent their careers working in the psychological fields of understanding how people make decisions under uncertainty. The introduction to this edited volume identifies three heuristics (in other words, rules...

Year Published: 1986

Type: Document

Book or Chapter or Journal Article

Risk and culture: an essay on the selection of technological and environmental dangers

www.nrfirescience.org/resource/15864

Perceptions of risk and danger are largely based on what society and organizations choose to value and what they choose to fear. Often, these values are shaped by larger organizational and political interests that bias perceptions of risk, danger, and responses that reinforce the values they match.

Scientific disagreement on what...

Author(s): Mary Douglas, Aaron Wildavsky

Year Published: 1982

Type: Document

Book or Chapter or Journal Article

Threat rigidity effects in organizational behavior: a multilevel analysis

www.nrfirescience.org/resource/15967

This article addresses how organizations deal with adversity and how organizations adapt within adverse conditions. The authors comment that most research emphasizes "organizational and not individual or group responses to adversity," and those studies tend to "take a functional stance". What those approaches leave out is...

Author(s): Barry Staw, Lance Sandelands, Jane Dutton

Year Published: 1981

Type: Document

Book or Chapter or Journal Article

Integrating Natural Hazard Mitigation Plans into Local Comprehensive Plans

www.nrfirescience.org/resource/16364

Local plans, such as the comprehensive plan, economic development plan, and transportation plan, establish policies that are intended to guide a community's day-to-day land use decisions and capital facilities expenditures. These policies have a major impact on whether people and property are exposed to natural hazards as well as...

Type: Media

Webinar

Wildland Fire Decision Support System (WFDSS)

www.nrfirescience.org/resource/60

This system is intended to assist fire managers and analysts in making strategic and tactical decisions for fire incidents. It is designed to replace the WFSA (Wildland Fire Situation Analysis), Wildland Fire Implementation Plan (WFIP), and Long-Term Implementation Plan (LTIP) processes with a single process that is easier to use,...

Type: Tool

Model or System

2014 WFSTAR: Fireline Leadership

www.nrfirescience.org/resource/16073

This 20 minute video covers the most essential element for success in the wildland fire service, which is good leadership. This module focuses on the framework, values, and principles that guide wildland fire leaders now and into the future. A portion of a Ted talk by general Stanley McCrystal is included in this video.

Type: Media

Video

Federal Fire Managers' Perceptions of the Importance, Scarcity and Substitutability of Suppression Resources

www.nrfirescience.org/resource/16351

A frequent prerequisite for meeting fire management objectives is the availability of key suppression resources, prepositioned for timely response. In the United States, multi-jurisdictional fire suppression demand is met by a national-scale pool of suppression resources that come from a variety of jurisdictions and provide a wide...

Type: Media

Webinar

Learning From Experts: Reflecting on a Burn Gone Bad - Riva Duncan

www.nrfirescience.org/resource/16043

Riva Duncan shares her story of being involved in an escaped prescribed fire. Riva explains how, after this event, she changed her methods of writing and implementing prescription burn plans.

Type: Media

Video

Wildfire risk assessment

www.nrfirescience.org/resource/13805

Large incident risk assessments: the roles of the agency administrator and the resource specialist.

Type: Media

Webinar

Temporal Dynamics of Wildfire Risk Assessments: Assessing tradeoffs and asking the hard questions

www.nrfirescience.org/resource/15794

Recent advances in integrating wildfire planning and strategic wildfire response can create more tangible fire outcomes that are better aligned the national cohesive strategy goals of living sustainably with wildfire. By integrating both in-situ and transboundary wildfire risk assessments with potential operations delineations, we...

Type: Media

Seminar

Standing Accountable - Lessons Learned From Cerro Grande

www.nrfirescience.org/resource/16033

Paul Gleason's insights on Type 3 IC decision making and other lessons learned from the Cerro Grande Prescribed fire escape. Presented to a S-490 Advanced Wildland Fire Behavior Calculation class in Fort Collins, Colorado on January 23, 2001.

Type: Media

Video

Risk, resilience, and the fire management system

www.nrfirescience.org/resource/15104

The future of wildland fire management in the US entails increasing complexity, risk, and scrutiny, and it is clear that business-as-usual is unsustainable. New paradigms recognize a need to deemphasize fire exclusion, expand application of prescribed and managed natural fire, and foster resilience and adaptation to fire....

Type: Media

Webinar

Landscape science solutions for resource managers

www.nrfirescience.org/resource/13217

Jerry Tagestad, Sr. Research Scientist with the Pacific Northwest National Laboratory, will discuss deriving information from geospatial data, and a recently developed fire risk model and how it might be adapted for the Great Basin. The ability to make informed decisions about landscape condition and fire risk usually isn't limited...

Type: Media

Webinar

Using climate information for risk mitigation and objective achievement in managed fire

www.nrfirescience.org/resource/12874

Considerable evidence exists that climate impacts wildfires and that climate change will continue to provide challenges for fire management. For fire managers, a key step in meeting those challenges is to identify ways to utilize climate information in order to both mitigate risks associated with wildfires and achieve objectives for...

Type: Media

Webinar

Bridging the Divide - Video 2: Values & Risks

www.nrfirescience.org/resource/15942

This video series is a compilation of post-fire interviews, workshops, and research presentations, highlighting the special conditions of the fire and the unique community outcomes. Through collaboration and partnerships, these mountain communities are learning to live with fire in the landscape. During the summer of 2013 over 1000...

Type: Media

Webinar

The Science of Budgeting Fire Programs - Integrating Fuels and Preparedness at National and Landscape Levels

www.nrfirescience.org/resource/16367

Doug Rideout discusses STARfire - a spatial planning and budgeting system integrating fuels, preparedness, and risk assessment guided by ROI. Scaleable from planning unit to regional to national levels.

Type: Media

Webinar

Fire behaviour: next gen Canadian Forest Fire Danger Rating System

www.nrfirescience.org/resource/16078

Mike Wotton from the Canadian Fire Service discussing the next generation Canadian Forest Fire Danger Rating System at the 2013 Fire Behaviour Symposium.

Type: Media

Video

Have definitions and standards for fire severity, hazard, and risk improved since 1999?

www.nrfirescience.org/resource/14269

In 1998 the General Accounting Office presented to Congress a comprehensive assessment of the wildfire threat to western national forests. The GAO report stated 'In 1995, the [Forest Service] agency estimated that 39 million acres are now at risk of large, uncontrollable, catastrophic fires.' The national assessment and mapping...

Type: Media

Video

Climate, Megafires, and Conservation Financing

www.nrfirescience.org/resource/16356

Join us in a discussion on how climatic changes can influence wildland fire activity across the globe and how these critical fire weather variables have changed over the last 40 years. These changes in key weather variables have combined to both lengthen the fire season and increase the fire weather severity within the fire season....

Type: Media

Webinar

Learning from the Experts: Ric Carlson - Time to Walk Away

www.nrfirescience.org/resource/16041

Ric Carlson describes how he develops the prescription window and uses a process of constant evaluation and updating that helps him avoid the traps always inherent with boundary selection. He talks about a scheduled burn that he and his crew decided to walk away from and the steps he took to make that decision.

Type: Media

Video

Making National Spatial Data Work on Your NW Landscape

www.nrfirescience.org/resource/15509

The principles of data modification are demonstrated through an example in Oregon's Rogue River Basin where LANDFIRE data were calibrated for use in a wildfire hazard analysis.

Type: Media

Webinar

David Calkin - What will it take to break the cycle of the wildfire paradox?

www.nrfirescience.org/resource/16193

This 20 minute presentation was given by David Calkin, research forester with the US Forest Service, at 3rd SW Fire Ecology Conference & 1st Applied Fire Science Workshop in Tucson, Arizona.

Type: Media

Video

Risk assessment to achieve fire-adapted communities

www.nrfirescience.org/resource/13218

The outline for this webinar is as follows - Trends and background in risk assessment Wildfire risk trajectory - system model Structured risk assessment Risk sharing in the WUI Risk transmission from FS lands to private lands

Type: Media

Webinar

Large incident risk assessments: the roles of the agency administrator and the resource specialist

www.nrfirescience.org/resource/13081

Stephen Gage, Asst. Dir., Operations for fire and aviation management USFS & Kevin Martin, Forest Supervisor, Umatilla National Forest discuss large incident risk assessments and the roles of the agency administrator and the resource specialist.

Type: Media

Webinar

LANDFIRE #2: Assessing needs - Grand Teton NP & Bridger-Teton NF risk assessment findings

www.nrfirescience.org/resource/12804

This is the second webinar in a series of three, developed by LANDFIRE, the Northern Rockies and Southern Rockies Fire Science Networks, and the Joint Fire Science Program. The webinar series is designed to introduce LANDFIRE data and tools, examine an on-the-ground application project in the Rockies region, and look at ways to...

Type: Media

Webinar

Developing an Effective Mitigation Strategy

www.nrfirescience.org/resource/15939

The heart of any natural hazards mitigation plan is the mitigation strategy. The strategy serves as the long-term blueprint for reducing your potential losses identified in the risk assessment. The mitigation strategy describes how you will accomplish the overall purpose of the planning process. This webinar will explore how to...

Type: Media

Webinar

The Story Behind the Yellowstone Fires of 1988: retro Report

www.nrfirescience.org/resource/16084

This 11 minute video covers the lessons learned from the summer of 1988 when fires burned nearly one third of Yellowstone National Park. The 1988 fire continue to shape the way we fight wildfires raging across the West today.

Type: Media

Video