Resilient landscapes to prevent catastrophic forest fires: Socioeconomic insights towards a new paradigm
www.nrfirescience.org/resource/23183
Extreme wildfires are a major environmental and socioeconomic threat across many regions worldwide. The limits of fire suppression-centred strategies have become evident even in technologically well-equipped countries, due to high-cost and a legacy of landscape transformations, yet with ultimately low-efficient solutions vis-à-vis...
Author(s): Sven Wunder, David E. Calkin, Val Charlton, Sarah Feder, Inazio Martinez de Arano, Peter F. Moore, Francisco Rodríguez y Silva, Luca Tacconi, Cristina Vega-García
Year Published: 2021
Type: Document
Book or Chapter or Journal Article

The Human Dimensions of Spatial, Pre-Wildfire Planning Decision Support Systems: A Review of Barriers, Facilitators, and Recommendations
www.nrfirescience.org/resource/23101
Decision support systems (DSSs) are increasingly common in forest and wildfire planning and management in the United States. Recent policy direction and frameworks call for collaborative assessment of wildfire risk to inform fuels treatment prioritization using the best available science. There are numerous DSSs applicable to forest...
Author(s): Melanie M. Colavito
Year Published: 2021
Type: Document
Book or Chapter or Journal Article

Optimum Sensors Allocation for a Forest Fires Monitoring System
www.nrfirescience.org/resource/23106
Every year forest fires destroy millions of hectares of land worldwide. Detecting forest fire ignition in the early stages is fundamental to avoid forest fires catastrophes. In this approach, Wireless Sensor Network is explored to develop a monitoring system to send alert to authorities when a fire ignition is detected. The study of...
Author(s): Beatriz Azevedo, Thadeu Brito, José Lima, Ana Pereira
Year Published: 2021
Type: Document
Book or Chapter or Journal Article

A qualitative study on the US Forest Service's risk management assistance efforts to improve wildfire decision-making
www.nrfirescience.org/resource/22940
To support improved wildfire incident decision-making, in 2017 the US Forest Service (Forest Service) implemented risk-informed tools and processes, together known as Risk Management Assistance (RMA). The Forest Service is developing tools such as RMA to improve wildfire decision-making and implements these tools in complex...
Author(s): Courtney Schultz, Lauren Miller, S. Michelle Greiner, Chad Kooistra
Year Published: 2021
Type: Document
Book or Chapter or Journal Article

Firefighter neural function and decision-making following rapid heat stress
www.nrfirescience.org/resource/22416
In the present experiment we evaluated the impact of rapid heat stress on decision-making and neural
function. Previous work has demonstrated that heat stress has an impact on cognitive and neural function. Here, we hypothesized that a rapid increase in heat stress would result in reduced decision-making ability evidenced by a...

Author(s): Cory J. Coehoorn, Lynneth A. Stuart-Hill, Wande Abimbola, J. Patrick Neary, Olave E. Krigolson
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

A Geospatial Framework to Assess Fireline Effectiveness for Large Wildfires in the Western USA
www.nrfirescience.org/resource/21767
Quantifying fireline effectiveness (FLE) is essential to evaluate the efficiency of large wildfire management strategies to foster institutional learning and improvement in fire management organizations. FLE performance metrics for incident-level evaluation have been developed and applied to a small set of wildfires, but there is a...
Author(s): Benjamin Gannon, Matthew P. Thompson, Kira Z. Deming, Jude Bayham, Yu Wei, Christopher D. O'Connor
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Probability-based wildfire risk measure for decision-making
www.nrfirescience.org/resource/21158
Wildfire is a natural element of many ecosystems as well as a natural disaster to be prevented. Climate and land usage changes have increased the number and size of wildfires in the last few decades. In this situation, governments must be able to manage wildfire, and a risk measure can be crucial to evaluate any preventive action...
Author(s): Adán Rodríguez-Martínez, Begoña Vitoriano
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Understanding acceptability of fuel management to reduce wildfire risk: informing communication through understanding complexity of thinking
www.nrfirescience.org/resource/21147
Understanding the social acceptability of managing forest fuels to reduce wildfire risk is essential to achieving long-term investment in fuel management that is supported publicly and politically. Integrative Complexity Theory (ICT) examines how people think about complex issues, and provides a way to better understand...
Author(s): Melinda R. Mylek, Jacki Schirmer
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Effects of policy change on wildland fire management strategies: evidence for a paradigm shift in the western US?
www.nrfirescience.org/resource/22049
In 2009, new guidance for wildland fire management in the United States expanded the range of strategic options for managers working to reduce the threat of high-severity wildland fire, improve forest health and respond to a changing climate. Markedly, the new guidance provided greater flexibility to
manage wildland fires to meet...
Author(s): Jesse Young, Alexander M. Evans, Jose M. Iniguez, Andrea E. Thode, Marc D. Meyer, Shaula J. Hedwall, Sarah M. McCaffrey, Patrick Shin, Ching-Hsun Huang
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Bridging the research-management gap: landscape science in practice on public lands in the western United States
www.nrfirescience.org/resource/21211
Context: Landscape science relies on foundational concepts of landscape ecology and seeks to understand the physical, biological, and human components of ecosystems to support land management decision-making. Incorporating landscape science into land management decisions, however, remains challenging. Many lands in the western...
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Exploring the 'issue-attention cycle': does length of time since wildfire predict social acceptability of prescribed burning?
www.nrfirescience.org/resource/21148
Social acceptability of environmental management actions, such as prescribed burning used to reduce wildfire risk, is critical to achieving positive outcomes. However, environmental managers often need to implement strategies over a long time period, and sustaining long-term community support can be challenging. Public attention to...
Author(s): Melinda R. Mylek, Jacki Schirmer
Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Risk management and analytics in wildfire response
www.nrfirescience.org/resource/20612
Purpose of Review: The objectives of this paper are to briefly review basic risk management and analytics concepts, describe their nexus in relation to wildfire response, demonstrate real-world application of analytics to support response decisions and organizational learning, and outline an analytics strategy for the future....
Author(s): Matthew P. Thompson, Yu Wei, David E. Calkin, Christopher D. O'Connor, Christopher J. Dunn, Nathaniel M. Anderson, John S. Hogland
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Fire regime and ecosystem responses: adaptive forest management in a changing world (Part 2)
www.nrfirescience.org/resource/19869
Fire is an ecological factor in ecosystems around the world, made increasingly more critical by unprecedented shifts in climate and human population pressure. The knowledge gradually acquired on the subject is needed to improve fire behaviour understanding and to enhance fire management decision-making. This issue (Volume 28, issue...
How stakeholders structure their collaborations to anticipate and tackle the threat of mountain pine beetle in the Jasper–Hinton (Alberta, Canada) area

The resilience of resource-based communities facing natural disturbances partly depends on the capacity of a wide diversity of stakeholders to share their expertise, articulate their efforts, and develop solutions that are both effective and equitable. Structural methods from network theory can be used to measure how efficiently and...

Author(s): Rodolphe Gonzalès, Lael Parrott
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Group Resilience: The Place and Meaning of Relational Pauses

Recent scholarship on resilience has shed light on the processes by which organizations absorb strain and maintain functioning in the face of adversity. These theories, however, often focus on the operational impacts of adversity without accounting for the strain it puts on organizational members and their abilities to work...

Author(s): Michelle Barton, William A. Kahn
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Emergency logistics for wildfire suppression based on forecasted disaster evolution

This paper aims to develop a two-layer emergency logistics system with a single depot and multiple demand sites for wildfire suppression and disaster relief. For the first layer, a fire propagation model is first built using both the flame-igniting attributes of wildfires and the factors affecting wildfire propagation and patterns....

Author(s): Zhongzhen Yang, Liquan Guo, Zaili Yang
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

A modelling framework for householder decision-making for wildfire emergencies

The occurrence of wildfire threats has increased in the last few decades creating serious challenges for thousands of communities around the world. Understanding the physical and social dynamics imposed by wildfires is fundamental to assessing and reducing the ensuing risk to different communities. Although, several studies...

Author(s): Ruggiero Lovreglio, Erica D. Kuligowski, Steven M. V. Gwynne, Ken Strahan
Year Published: 2019
Type: Document
Book or Chapter or Journal Article
Impacts of wildland fire effects on resources and assets through expert elicitation to support fire response decisions
www.nrfirescience.org/resource/20375
A modelling framework to spatially score the impacts from wildland fire effects on specific resources and assets was developed for and applied to the province of Ontario, Canada. This impact model represents the potential ‘loss’, which can be used in the different decision-making methods common in fire response operations (e.g....
Author(s): Colin B. McFayden, Den Boychuk, Douglas G. Woolford, Melanie J. Wheatley, Lynn Johnston
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Mapping combined wildfire and heat stress hazards to improve evidence-based decision making
www.nrfirescience.org/resource/19826
Heat stress and forest fires are often considered highly correlated hazards as extreme temperatures play a key role in both occurrences. This commonality can influence how civil protection and local responders deploy resources on the ground and could lead to an underestimation of potential impacts, as people could be less resilient...
Author(s): Claudia Vitolo, Claudia Di Napoli, Francesca Di Giuseppe, Hannah L. Cloke, Florian Pappenberger
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Modeling individual and group evacuation decisions during wildfires
www.nrfirescience.org/resource/19371
Quantifying factors that affect evacuation decision making remains a challenging task. Progress is crucial for developing predictive models of collective behavior and for designing effective policies to guide the action of populations during wildfires. We conduct a controlled behavioral experiment to probe factors influencing...
Author(s): Chantal Nguyen, Kimberly J. Schlesinger, Fangqiu Han, Izzeddin Gür, Jean M. Carlson
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Perception and management of sociopolitical risks on large fires
www.nrfirescience.org/resource/19086
This work examines the perceived impact of sociopolitical factors on large fire decision making. The study is based on a set of 74 large fires in USDA Forest Service Regions 5 and 6 for the years 2009-2013. All participants were fire managers, some as part of units affected by incidents and others associated with incident management...
Author(s): Armando Gonzalez-Caban, Donald G. MacGregor
Year Published: 2019
Type: Document
Conference Proceedings

Integrating Fire and Forest Planning: A Review of National Forest Plan Revisions
www.nrfirescience.org/resource/18142
The purpose of this thesis is to determine how wildland fire and forest planning are integrated during forest plan revisions. Specifically, three overarching questions are answered: 1) what is the decision-
making framework used in fire and forest planning?, 2) how are National Forests planning for wildland fire management?, and 3)...
Author(s): Hailey Graf
Year Published: 2018
Type: Document
Dissertation or Thesis

Wildland fire radio communication - common myths and best practices
www.nrfirescience.org/resource/18958
This Research Brief summarizes findings of a Joint Fire Science Program project focused on understanding radio communications as part of risk communication and sensemaking in wildland fire operations. Through observation of live and simulated radio conversations, analysis of training materials, and interviews with a variety of...
Author(s): Anne E. Black, Rebekah L. Fox, Elena Gabor, David Thomas, Jennifer Ziegler
Year Published: 2018
Type: Document
Research Brief or Fact Sheet

Rethinking the wildland fire management system
www.nrfirescience.org/resource/17822
In the western United States and elsewhere, the need to change society’s relationship with wildfire is well-recognized. Suppressing fewer fires in fire-prone systems is promoted to escape existing feedback loops that lead to ever worsening conditions and increasing risks to responders and communities. Our primary focus is how to...
Author(s): Matthew P. Thompson, Donald G. MacGregor, Christopher J. Dunn, David E. Calkin, John Phipps
Year Published: 2018
Type: Document
Book or Chapter or Journal Article

Blueprint for wildland fire science in Canada (2019-2029)
www.nrfirescience.org/resource/18910
The capacity of wildland fire science and technology in Canada is not keeping pace with the growing complexity of wildland fire. Fire seasons are becoming longer, fire events are becoming more severe, and experts predict that the area burned on an annual basis could double by the end of this century. However, wildfire research...
Year Published: 2018
Type: Document
Technical Report or White Paper

Twisp River operational and organizational learning report
www.nrfirescience.org/resource/17831
This report highlights how leadership has been proactively addressing safety issues, specifically, how the Safety Engagement sessions and Life First dialogues have already begun to address many of the systemic weaknesses that have been identified up to this point during the Twisp River Learning Review process. Recommendations are...
Author(s): United States Department of Agriculture
Year Published: 2017
Type: Document
Technical Report or White Paper
A review of the challenges to determining and demonstrating efficiency of large fire management
www.nrfirescience.org/resource/15488
Characterising 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 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

Cultivating a reluctance to simplify: exploring the radio communication context in wildland firefighting
www.nrfirescience.org/resource/19228
Although communication is often cited as a contributor to organisational accidents, complexities of the communication context are still understudied. In training materials and some investigative reports, communication is often presented as an equipment issue or as a simple skill that can be picked up on the job. However, interviews...
Author(s): Rebekah L. Fox, Elena Gabor, David Thomas, Jennifer Ziegler, Anne E. Black
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

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

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

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

An empirical machine learning method for predicting potential fire control locations for pre-fire planning and operational fire management

During active fire incidents, decisions regarding where and how to safely and effectively deploy resources to meet management objectives are often made under rapidly evolving conditions, with limited time to assess management strategies or for development of backup plans if initial efforts prove unsuccessful. Under all but the most...

Author(s): Christopher D. O'Connor, David E. Calkin, Matthew P. Thompson
Year Published: 2017
Type: Document
Book or Chapter or Journal Article

Towards enhanced risk management: planning, decision making and monitoring of US wildfire response

This paper is the preface to a special issue focused on US wildfire response. The nine papers included build from a 2016 conference special session on monitoring, modelling and accountability of fire management policies and practices. Here we provide the unifying theme for these papers, summarise each from this perspective, and...

Author(s): Christopher J. Dunn, David E. Calkin, Matthew P. Thompson
Year Published: 2017
Type: Document
Book or Chapter or Journal Article

Systems thinking and wildland fire management

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
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

Twisp River weather and fire behavior supplement report
www.nrfirescience.org/resource/17835
Provides a detailed weather report throughout the Twisp River Fire.
Author(s): Ronald Miller, Robert Tobin, Bret W. Butler, Charles W. McHugh
Year Published: 2016
Type: Document
Technical Report or White Paper

Risk perception, sense-making and resilient performance: the sounds of wildland firefighting in action - Final Report to the Joint Fire Science Program
www.nrfirescience.org/resource/15572
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, J. Ziegler, Elena Gabor, Rebekah L. Fox
Year Published: 2016
Type: Document
Technical Report or White Paper

Butte Fire Staff Ride - Preliminary Study
www.nrfirescience.org/resource/18001
On the afternoon of Aug. 29, 1985, the Butte Fire on the Salmon National Forest in central Idaho made a sudden high-intensity crown run up Wallace Creek, a side drainage of the Salmon River. Over the next 90 minutes, this run consumed 3,500 acres. Approximately 118 persons on the Division—including hand crews,...
Author(s): David Thomas
Year Published: 2016
Type: Document
Technical Report or White Paper

Twisp River Final Learning Review Narrative
www.nrfirescience.org/resource/17832
This expanded narrative adds to and builds on the Twisp River Status Report. It was written by a 25-member interagency team who visited the incident site, interviewed participants, reviewed official
documents, and used this information to recreate the August 19, 2015 events to the best of their abilities. Once the first draft of the...

Author(s): United States Department of Agriculture
Year Published: 2016
Type: Document
Technical Report or White Paper

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

Getting ahead of the wildfire problem: quantifying and mapping management challenges and opportunities
www.nrfirescience.org/resource/14688
Wildfire is a global phenomenon that plays a vital role in regulating and maintaining many natural and human-influenced ecosystems but that also poses considerable risks to human populations and infrastructure. Fire managers are charged with balancing the short-term protection of human assets sensitive to fire exposure against the...
Author(s): Christopher D. O'Connor, Matthew P. Thompson, Francisco Rodriguez y Silva
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

A mixed integer program to model spatial wildfire behavior and suppression placement decisions
www.nrfirescience.org/resource/13272
Wildfire suppression combines multiple objectives and dynamic fire behavior to form a complex problem for decision makers. This paper presents a mixed integer program designed to explore integrating spatial fire behavior and suppression placement decisions into a mathematical programming framework. Fire behavior and suppression...
Author(s): Erin J. Belval, Yu Wei, Michael Bevers
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Do staff rides help move the Forest Service toward its goal of becoming a learning organization?
www.nrfirescience.org/resource/18008
The Forest Service has declared its intention of becoming a learning organization. As a means to that end, the Forest Service has borrowed and adapted the staff ride concept from the military. This paper describes the staff ride product and compares it to what scientific research tells us about the nature of learning. Focus group...
Author(s): Joseph R. Harris
Year Published: 2015
Type: Document
Dissertation or Thesis
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

Decision making under uncertainty: recommendations for the Wildland Fire Decision Support System (WFDSS)
www.nrfirescience.org/resource/13947
The management of wildfire is a dynamic, complex, and fundamentally uncertain enterprise. Fire managers face uncertainties regarding fire weather and subsequent influence on fire behavior, the effects of fire on socioeconomic and ecological resources, and the efficacy of alternative suppression actions on fire outcomes. In these...
Author(s): Matthew P. Thompson
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

The ecological importance of mixed-severity fire: nature’s phoenix
www.nrfirescience.org/resource/16303
If you are a curious reader with a knack for the analytical, you may be asking yourself, Why start a book about fire ecology with a mythological figure? And if you are a tried-and-true scientist, like we are, you may also be asking, Isn’t it a bit risky to mix myth with science, fact with fiction, observation with mystique, nature...
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Predicting wildfire ignitions, escapes, and large fire activity using Predictive Service’s 7-Day Fire Potential Outlook in the western USA
www.nrfirescience.org/resource/13615
Can fire potential forecasts assist with pre-positioning of fire suppression resources, which could result in a cost savings to the United States government? Here, we present a preliminary assessment of the
7-Day Fire Potential Outlook forecasts made by the Predictive Services program. We utilized historical fire occurrence data and...
Author(s): Karen L. Riley, Crystal S. Stonesifer, Haiganoush K. Preisler, David E. Calkin
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

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

Economics of wildfire management: the development and application of suppression expenditure models
www.nrfirescience.org/resource/16161
In the United States, increased wildland fire activity over the last 15 years has resulted in increased pressure to balance the cost, benefits, and risks of wildfire management. Amid increased public scrutiny and a highly variable wildland fire environment, a substantial body of research has developed to study factors affecting the...
Author(s): Michael S. Hand, Krista M. Gebert, Jingjing Liang, David E. Calkin, Matthew P. Thompson, Mo Zhou
Year Published: 2014
Type: Document
Book or Chapter or Journal Article

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
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

Wildland firefighter entrapment avoidance: modelling evacuation triggers
www.nrfirescience.org/resource/12429
Wildland firefighters are often called on to make tactical decisions under stressful conditions in order to suppress a fire. These decisions can be hindered by human factors such as insufficient knowledge of surroundings and conditions, lack of experience, overextension of resources or loss of situational awareness. One potential...
Author(s): Gregory K. Fryer, Philip E. Dennison, Thomas J. Cova
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

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

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

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

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

Twelfth international wildland fire safety summit proceedings
www.nrfirescience.org/resource/12403
In October, the 12th International Wildland Fire Safety Summit in Sydney, Australia brought together students of fire from all over the world to explore new approaches in wildland fire safety. Participants attended from the USA, Switzerland, Hong Kong, France, New Zealand and Australia to take part in the summit.

Author(s): Rebekah L. Fox
Year Published: 2013
Type: Document
Conference Proceedings

Perspectives on disconnects between scientific information and management decisions on post-fire recovery in western US
www.nrfirescience.org/resource/12035
Environmental regulations frequently mandate the use of 'best available' science, but ensuring that it is used in decisions around the use and protection of natural resources is often challenging. In the
Western US, this relationship between science and management is at the forefront of post-fire land management decisions. Recent...
Author(s): Xiaoli Chen, Nathan Emery, Elizabeth S. Garcia, Erin J. Hanan, Heather E. Hodges, Tyronne Martin, Matthew A. Meyers, Lindsey E. Peavey, Hui Peng, Jaime Sainz Santamaria, Kellie A. Uyeda, Sarah E. Anderson, Christina Tague
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

The science of decision making: applications for sustainable forest and grassland management in the national forest system
www.nrfirescience.org/resource/16143
Sustainable management of national forests and grasslands within the National Forest System (NFS) often requires managers to make tough decisions under considerable uncertainty, complexity, and potential conflict. Resource decisionmakers must weigh a variety of risks, stressors, and challenges to sustainable management, including...
Author(s): Matthew P. Thompson, Bruce G. Marcot, Frank R. Thompson, Steven G. McNulty, Larry A. Fisher, Michael C. Runge, David Cleaves, Monica S. Tomosy
Year Published: 2013
Type: Document
Technical Report or White Paper

Wildland Fire Management Decision Making
www.nrfirescience.org/resource/21036
Wildland fire management in the United States has historically been a challenging and complex program governed by a multitude of factors including situational status, objectives, operational capability, science and technology, and changes and advances in all these factors. The improvement and advancement of risk-informed decision...
Author(s): Tom Zimmerman
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

Cramer Staff Ride: Preliminary study
www.nrfirescience.org/resource/18011
The Cramer fire began as a fairly typical mid-slope ignition on the south-facing slope of the steep Salmon River Canyon during an extended drought that saw live fuel moistures in late July falling below the benchmark record of 2000. On July 22, the fourth day after ignition, and three days from detection and engagement, the fire...
Year Published: 2012
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

Recent advances in applying decision science to managing managing national forests
www.nrfirescience.org/resource/16176
Management of federal public forests to meet sustainability goals and multiple use regulations is an immense challenge. To succeed, we suggest use of formal decision science procedures and tools in the context of structured decision making (SDM). SDM entails four stages: problem structuring (framing the problem and defining...)
Author(s): Bruce G. Marcot, Matthew P. Thompson, Michael C. Runge, Frank R. Thompson, Steven G. McNulty, David Cleaves, Monica S. Tomosy, Larry A. Fisher, Andrew Bliss
Year Published: 2012
Type: Document
Book or Chapter or Journal Article

The Wildland Fire Decision Support System: Integrating science, technology, and fire management
www.nrfirescience.org/resource/21042
Federal agency policy requires documentation and analysis of all wildland fire response decisions. In the past, planning and decision documentation for fires were completed using multiple unconnected processes, yielding many limitations. In response, interagency fire management executives chartered the development of the Wildland...
Author(s): Morgan Pence, Tom Zimmerman
Year Published: 2011
Type: Document
Book or Chapter or Journal Article

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 risk management 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 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 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

Developing the U.S. Wildland Fire Decision Support System
www.nrfirescience.org/resource/21039
A new decision support tool, the Wildland Fire Decision Support System (WFDSS) has been developed to support risk-informed decision-making for individual fires in the United States. WFDSS accesses national weather data and forecasts, fire behavior prediction, economic assessment, smoke management assessment, and landscape databases...
Author(s): Erin Noonan-Wright, Tonja S. Opperman, Mark A. Finney, Tom Zimmerman, Robert C. Seli, Lisa M. Elenz, David E. Calkin, John R. Fiedler
Year Published: 2011
Type: Document
Book or Chapter or Journal Article

Forest road erosion control using multiobjective optimization
www.nrfirescience.org/resource/16187
Forest roads are associated with accelerated erosion and can be a major source of sediment delivery to streams, which can degrade aquatic habitat. Controlling road-related erosion therefore remains an important issue for forest stewardship. Managers are faced with the task to develop efficient road management strategies to achieve...
Author(s): Matthew P. Thompson, Jeff Sessions, Kevin Boston, Arne Skaugset, David Tomberlin
Year Published: 2010
Type: Document
Book or Chapter or Journal Article

Wildland Fire and Organic Discourse: Negotiating Place and Leisure Identity in a Changing Wildland Urban Interface
www.nrfirescience.org/resource/17484
A lack of research on the conceptual intersection of leisure, place and wildland fire and its role in identity prompted this exploratory study. The purpose of this research was to gather evidence regarding how people negotiate identities under the threat of wildland fire. Qualitative interviews with 16
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, its 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

External Human Factors in Incident Management Team Decision making and Their Effect on Large Fire Suppression Expenditures
www.nrfirescience.org/resource/20522
Large wildland fires are complex, costly events influenced by a vast array of physical, climatic, and social factors. Changing climate, fuel buildup due to past suppression, and increasing populations in the wildland-urban interface have all been blamed for the extreme fire seasons and rising suppression expenditures of recent years...
Author(s): Janie Canton-Thompson, Krista M. Gebert, Brooke Thompson, J. Greg Jones, David E. Calkin, Geoffrey H. Donovan
Year Published: 2008
Type: Document
Book or Chapter or Journal Article

Wildland fire use barriers and facilitators
www.nrfirescience.org/resource/16055
The Forest Service authorizes broad scale wildland fire use (WFU) both inside and outside wilderness areas in many western forests; but, will agency authorization alone lead to implementation? Understanding barriers and facilitators to WFU implementation is critical for establishing realistic program expectations and providing a...
Author(s): Anne E. Black, Martha A. Williamson, Dustin Doane
Year Published: 2008
Type: Document
Book or Chapter or Journal Article

Decision modeling for analyzing fire action outcomes
www.nrfirescience.org/resource/16234
A methodology for incident decomposition and reconstruction is developed based on the concept of an "event-frame model." The event-frame model characterizes a fire incident in terms of (a) environmental events that pertain to the fire and the fire context (e.g., fire behavior, weather, fuels) and (b) management events that represent...
Author(s): Donald G. MacGregor, Armando Gonzalez-Caban
Year Published: 2008
Type: Document
Technical Report or White Paper
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

Factors in United States Forest Service district rangers’ decision to manage a fire for resource benefit
www.nrfirescience.org/resource/8204
United States wildland fire policy and program reviews in 1995 and 2000 required both the reduction of hazardous fuel and recognition of fire as a natural process. Despite the fact that existing policy permits managing natural ignitions to meet resource benefits, or Wildland Fire Use (WFU), most fuel reduction projects rely on...
Author(s): Martha A. Williamson
Year Published: 2007
Type: Document
Book or Chapter or Journal Article

Management Strategies for Complex Adaptive Systems Sensemaking, Learning, and Improvisation
www.nrfirescience.org/resource/17434
Misspecification of the nature of organizations may be a major reason for difficulty in achieving performance improvement. Organizations are often viewed as machine-like, but complexity science suggests that organizations should be viewed as complex adaptive systems. I identify the characteristics of complex adaptive systems and...
Author(s): Reuben R. McDaniel
Year Published: 2007
Type: Document
Book or Chapter or Journal Article

A national study of the consequences of fire and fire surrogate treatments
www.nrfirescience.org/resource/15633
We provide highlights of some of the results thus far for the National Fire and Fire Surrogate study (FFS). Highlights summarize work that has been published within the last four years (2003-2006), primarily in theses, proceedings, general technical reports, and peer-reviewed journals (http://www.fs.fed.us/ffs/). In the summary, we...
Author(s): James D. McIver, Phil Weatherspoon
Year Published: 2006
Type: Document
Technical Report or White Paper

The go point: when it’s time to decide - knowing what to do and when to do it
www.nrfirescience.org/resource/16253
In Useem’s earlier book, “The Leadership Moment,” he described leadership lessons that could be learned from various situations, including the Mann Gulch disaster. In this book, Useem has turned his
attention from leadership to decision making, where he states that every decision comes down to a “go point—that decisive...

Author(s): Michael Useem
Year Published: 2006
Type: Document
Book or Chapter or Journal Article

**Use of human factors analysis for wildland fire accident investigations**

[www.nrfirescience.org/resource/196](http://www.nrfirescience.org/resource/196)

Accident investigators at any level are challenged with identifying causal factors and making preventative recommendations. This task can be particularly complicated considering that 70-80% of accidents are associated with human error. Due to complexities of the wildland fire environment, this is especially challenging when...

Author(s): Michelle Ryerson, Chuck Whitlock
Year Published: 2005
Type: Document
Conference Proceedings

**Blink: the power of thinking without thinking**

[www.nrfirescience.org/resource/16211](http://www.nrfirescience.org/resource/16211)

Consistently successful decision making can make or break an individual or an organization. Perhaps counter intuitively, individuals who repeatedly make effective, successful decisions are not necessarily those who have the most information or spend the most time weighing the decision. Instead, they have perfected the art of “thin...

Author(s): Malcolm Gladwell
Year Published: 2005
Type: Document
Book or Chapter or Journal Article

**Shared mindfulness in cockpit crisis situations**

[www.nrfirescience.org/resource/15912](http://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

**Can behavioral decision theory explain risk-averse fire management decisions?**

[www.nrfirescience.org/resource/12719](http://www.nrfirescience.org/resource/12719)

Organizations managing forest land often make fire management decisions that seem overly risk-averse in relation to their stated goals for ecosystem restoration, protection of sensitive species and habitats, and protection of water and timber resources. Research in behavioral decision theory has shown that people faced with...

Author(s): Lynn A. Maguire, Elizabeth A. Albright
Year Published: 2005
Type: Document
Book or Chapter or Journal Article
Eighth international wildland firefighter safety summit: 10 years later
www.nrfirescience.org/resource/15458
These files contain the proceedings and poster papers from the International Association of Wildland Fire's Wildland Fire Safety Summit™ held in Missoula, Montana April 26-28, 2005. These proceedings contain the papers as submitted by the authors. Except for some editing to try and instill a common format, these papers are as...
Year Published: 2005
Type: Document
Conference Proceedings

Deep survival: who lives, who dies and why
www.nrfirescience.org/resource/16217
Gonzales attempts to answer the question of why, in life threatening events, do some people survive and others die? In a series of true-life stories about people who have had skills and behaviors of “miraculous endurance” or who have met “sudden death,” Gonzales describes how people get into life threatening jams and how...
Author(s): Laurence Gonzales
Year Published: 2004
Type: Document
Book or Chapter or Journal Article

How professionals make decisions
www.nrfirescience.org/resource/16238
This book was published following a conference on naturalistic decision making held in Stockholm in 2000. Naturalistic decision making (NDM) is a subset of decision making theory that focuses on situations where there are ill-structured problems; uncertain dynamic environments; shifting, ill-defined, or competing goals; action/...
Year Published: 2004
Type: Document
Book or Chapter or Journal Article

Public management decision making: effects of decision content
www.nrfirescience.org/resource/16203
One obvious aspect of public management decisions and decision making has largely escaped attention—decision content. We examine the effects of decision content by asking the following questions for budget cutback and information technology decisions: How does content affect the time required for decision making? How does content...
Author(s): Barry Bozeman, Sanjay K. Pandey
Year Published: 2004
Type: Document
Book or Chapter or Journal Article

MODIS Applications in 2003 Fire Management - Slide presentation
www.nrfirescience.org/resource/11516
Powerpoint presentation MODIS Applications in 2003 Fire Management
Author(s): C. A. Ryan, Bryce L. Nordgren, James P. Menakis, Mark A. Finney, Wei Min Hao
Year Published: 2004
Type: Document
Conference Proceedings
A "worldview" of disaster: organizational sensemaking in a wildland firefighting tragedy

www.nrfirescience.org/resource/16262
From documents related to the 1994 South Canyon fire in Colorado, Larson examines how two worldviews presented by J.R. Taylor in his book, “Rethinking the theory of organizational communication: how to read an organization” function as sensemaking tools, both retrospectively and during crisis decision making. As Taylor explains...
Author(s): Gregory Larson
Year Published: 2003
Type: Document
Book or Chapter or Journal Article

Columbia accident review board report

www.nrfirescience.org/resource/16259
The Columbia Accident Review Board's (CAIB) investigation of the February 1, 2003 loss of the space shuttle Columbia lasted nearly 7 months. The loss of seven crew members and later, two debris searchers, lead to a thorough attempt to discover the truth behind the accident. The board recognized early that the accident was not...
Year Published: 2003
Type: Document
Book or Chapter or Journal Article

Not all decisions are created equal: when faced with a series of tough choices, where do you start?

www.nrfirescience.org/resource/16228
Problem solvers need to examine the differences that exist between decisions and the approaches available for making decisions. This short article presents four types of decisions problem solvers face and offers recommendations for each. These types of decisions include: zone of indifference choices, comparison choices, intuitive...
Author(s): Gary Klein
Year Published: 2003
Type: Document
Book or Chapter or Journal Article

Sensemaking on the shop floor: narratives of knowledge in organizations

www.nrfirescience.org/resource/16264
In this study, Patriotta examines the ways in which an organization’s workers experience the “everyday routines, interaction, and events that constitute both individual and social practices”. He studies the narratives that are told within an organization, particularly during moments of disruptive occurrences. Examining these...
Author(s): Gerardo Patriotta
Year Published: 2003
Type: Document
Book or Chapter or Journal Article

Intuition at work

www.nrfirescience.org/resource/16229
Intuition is an important factor in decision making, equal to the roles of reading data and interpreting numbers. Klein defines intuition as “the way we translate our experiences into action”. Based upon his research, involving interviews with a number of life-and-death decision makers, Klein found that 90 percent of critical...
Situational influences of acceptable wildland fire management actions
www.nrfirescience.org/resource/21727
This paper examines how acceptance of wildland fire management actions is affected by fire-specific situational factors. Respondents' evaluated the acceptability of 'immediately extinguishing a fire,' 'letting the fire burn in a contained area,' or 'letting the fire burn uncontrolled' for eight scenarios (fractional factorial design).

Author(s): Katie Kneeshaw, Jerry J. Vaske, James D. Absher
Year Published: 2003
Type: Document
Book or Chapter or Journal Article

Emerging perspectives on judgment and decision research
www.nrfirescience.org/resource/16251
This edited book is an excellent resource for those who wish to probe deeper into the state of the art research on emerging issues in judgment and decision making. The editors’ stated purpose is to provide “fresh perspectives on decision making”. The authors are particularly interested in how non-traditional topics such as...

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

Making strategic choices
www.nrfirescience.org/resource/16241
This article offers four alternative prescriptions for making strategic choices in organizations: 1) analysis; 2) inspiration; 3) bargaining; and 4) judgment. Decision makers should use analysis when both the objectives and the means for producing results are knowable. This means commissioning a pilot test to evaluate means and...

Author(s): Paul C. Nutt
Year Published: 2002
Type: Document
Book or Chapter or Journal Article

Why decisions fail
www.nrfirescience.org/resource/16242
In this book, Nutt discusses why half of all decisions that are made fail, how a decision becomes a fiasco, and how failures can be prevented. Failed decisions occur as a result of three blunders (rushing to judgment, misusing resources, and applying failure-prone tactics) and seven traps (misleading claims, barriers to action, lack...

Author(s): Paul C. Nutt
Year Published: 2002
Type: Document
Book or Chapter or Journal Article

Tool retention and fatalities in wildland fire settings: conceptualizing the naturalistic
www.nrfirescience.org/resource/16257
Comparing several well-known wildfires, Weick argues for a causal connection between firefighter tool retention and fatalities. To Weick, tools are an extension of firefighter identity and to drop one's tools is to let go of one's identity. He believes improvisation during high stress situations will increase safety and help...

Author(s): Karl E. Weick
Year Published: 2001
Type: Document
Book or Chapter or Journal Article

Making sense of the organization
www.nrfirescience.org/resource/16265
This collection of Weick's writings addresses a central theme of organizational sensemaking, which he defines as a means by which organizational members retrospectively make sense of situations, actions, and choices. The first part of the book describes what sensemaking is and how it fits within the context of organizations,...

Author(s): Karl E. Weick
Year Published: 2001
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

The Bitterroot Ecosystem Management Research Project: what we have learned, symposium proceedings; May 18-20, 1999; Missoula, MT
www.nrfirescience.org/resource/11890
The varied topics presented in these symposium proceedings represent the diverse nature of the Bitterroot Ecosystem Management Research Project (BEMRP). Separated into six sections, the papers cover the different themes researched by BEMRP collaborators as well as brief overviews of five other ecosystem management projects. The...

Author(s): Helen Y. Smith
Year Published: 2000
Type: Document
Conference Proceedings

Do conflict management styles affect group decision making? Evidence from a longitudinal field study
www.nrfirescience.org/resource/16233
This article examines the relationship between group management styles and the effectiveness of group decision making. The researchers first identified conflict management styles and then analyzed group decisions and their effectiveness. The results of the study show that most groups develop management styles consistent with one...

Author(s): Timothy Kuhn, M. Scott Poole
Sources of power: how people make decisions
www.nrfirescience.org/resource/16227
Klein presents observations of humans acting under real-life constraints such as time pressure, high stakes outcomes, high-levels of personal responsibility, limited information, changing goals, and shifting conditions. Klein studies decision making in the field—observing firefighters, intensive-care units, and chess games—to...
Author(s): Gary Klein
Year Published: 2000
Type: Document
Book or Chapter or Journal Article

Dialogue and the art of thinking together
www.nrfirescience.org/resource/16219
In this book, Isaacs argues that we should learn to kindle and sustain a new conversational spirit in our relationships, organizations, and communities. A conversational spirit will help us in times of frustration and conflict and help us work together to a more promising future. Isaacs discusses what encourages and discourages such...
Author(s): William Isaacs
Year Published: 1999
Type: Document
Book or Chapter or Journal Article

Surprising but true: half the decisions in organizations fail
www.nrfirescience.org/resource/16240
According to Nutt, decisions that fail in organizations can be traced to managers who impose decisions, limit the search for alternatives, and use power to implement plans. Nutt finds that managers who make the need for action clear, set objectives, search for multiple alternatives, and encourage participation from others are more...
Author(s): Paul C. Nutt
Year Published: 1999
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

Reframing and organizational action
www.nrfirescience.org/resource/16245
Palmer and Dunford analyze the concept of reframing and discuss four key limits to this concept. Reframing literature asserts that people generally are trapped into a singular way of thinking about a situation, and thus, they are unable to think more creatively about situations and problems they may encounter on the job. Some...

Author(s): Ian Palmer, Richard Dunford
Year Published: 1996
Type: Document
Book or Chapter or Journal Article

**Drop your tools: an allegory for organizational studies**
www.nrfirescience.org/resource/16256

One of the critical mistakes made by wildland firefighters during both the Mann Gulch and South Canyon fires was their unwillingness to drop heavy tools and packs as they attempted to outrun the flames. Weick points to 10 possible reasons for their unwillingness: listening, justification, trust, control, skill at dropping, skill...

Author(s): Karl E. Weick
Year Published: 1996
Type: Document
Book or Chapter or Journal Article

**Findings from the Wildland Firefighters Human Factors Workshop. Improving wildland firefighter performance under stressful, risky conditions: Toward better decisions on the fireline and more resilient organizations**
www.nrfirescience.org/resource/15468

It has become increasingly clear that wildland firefighters are experiencing collapses in decisionmaking and organizational structure when conditions on the fireline become life-threatening. Since 1990 wildland fire agencies have lost 23 people who might have survived had they simply dropped their tools and equipment for greater...

Author(s): Ted Putnam
Year Published: 1995
Type: Document
Technical Report or White Paper

**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

**Toward a theory of situation awareness in dynamic systems**
www.nrfirescience.org/resource/16209

Endsley examines the interrelation between situation awareness and individual and environmental factors. Endsley argues that situation awareness is more than a person just being aware of the situation. Rather, it is a complex understanding of the situation, and requires the ability to project what the future might bring. Further,...

Author(s): Mica Endsley
Putting the balanced scorecard to work
[www.nrfirescience.org/resource/16225](www.nrfirescience.org/resource/16225)
This article summarizes Kaplan and Norton's earlier work on the “balanced scorecard” system, a set of measures designed to give a manager an overview of business performance. This comprehensive scorecard system is grounded in an organization's strategic objectives and competitive demands. It includes measures of financial...
Author(s): Robert S. Kaplan, David P. Norton
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](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 collapse of sensemaking in organizations: the Mann Gulch disaster
[www.nrfirescience.org/resource/15592](www.nrfirescience.org/resource/15592)
The death of 13 men in the Mann Gulch fire disaster, made famous in Norman Maclean's Young Men and Fire, is analyzed as the interactive disintegration of role structure and sensemaking in a minimal organization. Four potential sources of resilience that make groups less vulnerable to disruptions of sensemaking are proposed to...
Author(s): Karl E. Weick
Year Published: 1993
Type: Document
Book or Chapter or Journal Article

Organizational values and control
[www.nrfirescience.org/resource/16205](www.nrfirescience.org/resource/16205)
Using the USDA Forest Service as an example, Bullis shows how decision making is largely determined by decision premises. Examples of premises include values, beliefs, and more broadly, culture. Bullis explores the ability of organizations to control decision making through employee identification with shared value premises. The...
Author(s): Connie Bullis
Year Published: 1993
Type: Document
Book or Chapter or Journal Article

The balanced scorecard: measures that drive performance
[www.nrfirescience.org/resource/16224](www.nrfirescience.org/resource/16224)
This article introduces the reader to Kaplan and Norton’s “balanced scorecard” system, a set of measures designed to give a manager an overview of business performance. The scorecard includes four measures. The first measure is financial, the traditional measure of performance. The other three measures include customer...

Author(s): Robert S. Kaplan, David P. Norton
Year Published: 1992
Type: Document
Book or Chapter or Journal Article

Pinto fires and personal ethics: a script analysis of missed opportunities
www.nrfirescience.org/resource/16215
This article gives a personal account of Gioia’s experience with the Ford Motor Company during a defective vehicle recall. As the recall coordinator, Gioia had to manage a busy office and keep up with a large amount of information that he needed to process. In comparing himself to a fireman, he states that his job felt like...

Author(s): Dennis Gioia
Year Published: 1992
Type: Document
Book or Chapter or Journal Article

Making fast strategic decisions in high-velocity environments
www.nrfirescience.org/resource/16207
In order to make reliable decisions, organizations need to have reliable access to critical information. However, high velocity environments place severe restrictions on information flow. Despite this handicap, many organizations in high velocity environments are still able to achieve relatively high levels of success. This study...

Author(s): Kathleen Eisenhardt
Year Published: 1989
Type: Document
Book or Chapter or Journal Article

Decision traps: the ten barriers to brilliant decision-making and how to overcome them
www.nrfirescience.org/resource/18893
Make Every Decision Your Best Decision Executives rate decision-making ability as the most important business skill, but few people have the training they need to make good decisions consistently. Becoming a good decision-maker is like training to be a top athlete: Just as the best coaches use training methods to help athletes...

Author(s): J. Edward Russo, Paul J. H. Schoemaker
Year Published: 1989
Type: Document
Book or Chapter or Journal Article

Decision traps
www.nrfirescience.org/resource/16248
As with any other skill, the ability to make effective decisions can be taught and improved upon. Russo and Shoemaker provide a guide to systematic decision making by delineating several key points in the decision making process. The first step in the process is to determine how to frame issues effectively. Once the problem/issue...

Author(s): J. Edward Russo, Paul J. H. Schoemaker
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Author(s): Karl E. Weick
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