

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

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

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

www.nrfirescience.org/resource/17000

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

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

Year Published: 2017

Type: Document

Technical Report or White Paper

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

A simulation and optimisation procedure to model daily suppression resource transfers during a fire season in Colorado

www.nrfirescience.org/resource/15495

Sharing fire engines and crews between fire suppression dispatch zones may help improve the

utilisation of fire suppression resources. Using the Resource Ordering and Status System, the Predictive Services' Fire Potential Outlooks and the Rocky Mountain Region Preparedness Levels from 2010 to 2013, we tested a simulation and...

Author(s): Yu Wei, Erin J. Belval, Matthew P. Thompson, David E. Calkin, Crystal S. Stonesifer

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Federal fire managers' perceptions of the importance, scarcity and substitutability of suppression resources

www.nrfirescience.org/resource/15491

Wildland firefighting in the United States is a complex and costly enterprise. While there are strong seasonal signatures for fire occurrence in specific regions of the United States, spatiotemporal occurrence of wildfire activity can have high inter-annual variability. Suppression resources come from a variety of jurisdictions and...

Author(s): Crystal S. Stonesifer, David E. Calkin, Michael S. Hand

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

Bridging the divide between fire safety research and fighting fire safely: how do we convey research innovation to contribute more effectively to wildland firefighter safety?

www.nrfirescience.org/resource/14936

Creating a safe workplace for wildland firefighters has long been at the centre of discussion for researchers and practitioners. The goal of wildland fire safety research has been to protect operational firefighters, yet its contributions often fall short of potential because much is getting lost in the translation of peer-reviewed...

Author(s): Theodore Adams, Bret W. Butler, Sara Brown, Vita Wright, Anne E. Black

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Sustainability and wildland fire: The origins of Forest Service Wildland Fire Research

www.nrfirescience.org/resource/15768

On June 1, 2015, the Forest Service, an agency of the U.S. Department of Agriculture (USDA), celebrated the 100th anniversary of the Branch of Research. Established in 1915 to centralize and elevate the pursuit of research throughout the agency, the Branch of Research focused on everything from silvicultural investigations conducted...

Author(s): Diane M. Smith

Year Published: 2017
Type: Document
Book or Chapter or Journal Article

Wildland firefighter exposure to hydrocarbons

www.nrfirescience.org/resource/16582

Wildland firefighters suppressing wildland fires or conducting prescribed fires work long shifts and are exposed to high levels of smoke with no respiratory protection. Inhalation of smoke is a safety concern for wildland firefighters and can potentially impair their performance and cause short and long term health impacts.

Author(s): Kathleen M. Navarro, Stacey S. Frederick

Year Published: 2017

Type: Document

Research Brief or Fact Sheet

A LiDAR-based analysis of the effects of slope, vegetation density, and ground surface roughness on travel rates for wildland firefighter escape route mapping

www.nrfirescience.org/resource/16288

Escape routes are essential components of wildland firefighter safety, providing pre-defined pathways to a safety zone. Among the many factors that affect travel rates along an escape route, landscape conditions such as slope, lowlying vegetation density, and ground surface roughness are particularly influential, and can be measured...

Author(s): Michael J. Campbell, Philip E. Dennison, Bret W. Butler

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

Wildland Fire Smoke Health Effects on Wildland Firefighters and the Public - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/17009

Wildland fire smoke is a complex mixture of air contaminants that have the potential cause adverse health effects. Individuals can be exposed occupationally if they work as wildland firefighters or public exposure from ambient air that is contaminated with smoke from a nearby or distant wildland fire. Previous studies of public...

Author(s): Joe Domitrovich, George Broyles, Roger D. Ottmar, Timothy E. Reinhardt, Luke P. Naeher, Michael T. Kleinman, Kathleen M. Navarro, Christopher E. Mackay, Olorunfemi Adetona

Year Published: 2017

Type: Document

Technical Report or White Paper

Occupational Exposure to Polycyclic Aromatic Hydrocarbon of Wildland Firefighters at Prescribed and Wildland Fires

www.nrfirescience.org/resource/16419

Wildland firefighters suppressing wildland fires or conducting prescribed fires work long shifts during which they are exposed to high levels of wood smoke with no respiratory protection. Polycyclic aromatic hydrocarbons (PAHs) are hazardous air pollutants formed during incomplete combustion. Exposure to PAHs was measured for 21...

Author(s): Kathleen M. Navarro, Ricardo Cisneros, Elizabeth M. Noth, John R. Balmes, Katharine Hammond

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

Studying interregional wildland fire engine assignments for large fire suppression

www.nrfirescience.org/resource/15497

One crucial component of large fire response in the United States (US) is the sharing of wildland firefighting resources between regions: resources from regions experiencing low fire activity supplement resources in regions experiencing high fire activity. An important step towards improving the efficiency of resource sharing and...

Author(s): Erin J. Belval, Yu Wei, David E. Calkin, Crystal S. Stonesifer, Matthew P. Thompson, John R. Tipton

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

Characterising resource use and potential inefficiencies during large-fire suppression in the western US

www.nrfirescience.org/resource/15492

Currently, limited research on large-fire suppression effectiveness suggests fire managers may over-allocate resources relative to values to be protected. Coupled with observations that weather may be more important than resource abundance to achieve control objectives, resource use may be driven more by risk aversion than...

Author(s): Hari Katuwal, Christopher J. Dunn, 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

www.nrfirescience.org/resource/15490

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

www.nrfirescience.org/resource/15485

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

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

An empirically based approach to defining wildland firefighter safety and survival zone separation distances

www.nrfirescience.org/resource/16748

Wildland firefighters in the US are mandated to identify areas that provide adequate separation between themselves and the flames (i.e. safety zones) to reduce the risk of burn injury. This study

presents empirical models that estimate the distance from flames that would result in a low probability (1 or 5%) of either fatal or non-...

Author(s): Wesley G. Page, Bret W. Butler

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Using reverse geocoding to identify prominent wildfire evacuation trigger points

www.nrfirescience.org/resource/16290

Wildfire evacuation trigger points are prominent geographic features (e.g., ridge lines, rivers, and roads) utilized in timing evacuation warnings. When a fire crosses a feature, an evacuation warning is issued to the communities or firefighters in the path of the fire. Current methods for generating trigger buffers have limited...

Author(s): Dapeng Li, Thomas J. Cova, Philip E. Dennison

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Qualitative flow visualization of flame attachment on slopes

www.nrfirescience.org/resource/16566

Heating of unburned fuel by attached flames and plume of a wildfire can produce high spread rates that have resulted in firefighter fatalities worldwide. Qualitative flow fields of the plume of a gas burner embedded in a table tilted to 0°, 10°, 20°, and 30° above horizontal were imaged using the retroreflective shadowgraph...

Author(s): Torben Grumstrup, Sara S. McAllister, Mark A. Finney

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Telling fire's story through narrative and art

www.nrfirescience.org/resource/17029

Modern works by highly skilled narrative authors and artists have become increasingly useful for telling the story of wildland fire in the United States. Using unconventional means—and with partial funding by the Joint Fire Science Program—creative individuals have spawned some colorful and heartfelt messages that convey...

Author(s): Stephen W. Barrett

Year Published: 2017

Type: Document

Research Brief or Fact Sheet

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

Outcomes of fire research: is science used?

www.nrfirescience.org/resource/14369

An assessment of outcomes from research projects funded by the Joint Fire Science Program was conducted to determine whether or not science has been used to inform management and policy decisions and to explore factors that facilitate use of fire science. In a web survey and follow-up phone interviews, I asked boundary spanners and...

Author(s): Molly E. Hunter

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Risk perception, sense-making and resilient performance: the sounds of wildland firefighting in action

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

Safe separation distance score: a new metric for evaluating wildland firefighter safety zones using Lidar

www.nrfirescience.org/resource/16910

Safety zones are areas where firefighters can retreat to in order to avoid bodily harm when threatened by burnover or entrapment from wildland fire. At present, safety zones are primarily designated by firefighting personnel as part of daily fire management activities. Though critical to safety zone assessment, the effectiveness of...

Author(s): Michael J. Campbell, Philip E. Dennison, Bret W. Butler

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

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

Managing the market: how procurement practices impact private sector wildfire response capacity

www.nrfirescience.org/resource/15575

Effective wildfire management requires significant institutional organization, a skilled workforce, facilities, and equipment. Sustaining sufficient wildfire response capacity is critical to both agencies and communities that are affected by fire. Because fire suppression is seasonal work and demands vary considerably from year to...

Author(s): Heidi Huber-Stearns, Cassandra Moseley, Autumn Ellison

Year Published: 2016

Type: Document

Technical Report or White Paper

The relationship of mindfulness and self-compassion to desired wildland fire leadership

www.nrfirescience.org/resource/13268

A quantitative approach was adopted to explore facets of mindfulness and self-compassion in relation to their ability to predict crewmembers' perceptions of their supervisors' leadership capabilities. The sample comprised 43 wildland fire crews consisting of their primary supervisors (n = 43) and crewmembers (n = 246). A partial...

Author(s): Alexis L. Waldron, Vicki Ebbeck

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Recent findings relating to firefighter safety zones

www.nrfirescience.org/resource/16918

Designation of safety zones is a primary duty of all wildland firefighters. Unfortunately, information regarding what constitutes an adequate safety zone is inadequately defined. Measurements of energy release from wildland fires have been used to develop an empirically based safety zone guideline. The basis for this work is...

Author(s): Bret W. Butler, Russell A. Parsons, William E. Mell

Year Published: 2015

Type: Document

Conference Proceedings

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

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

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

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

Vegetation clearance distances to prevent wildland fire caused damage to telecommunication and power transmission infrastructure

www.nrfirescience.org/resource/16921

Towers and poles supporting power transmission and telecommunication lines have collapsed due to

heating from wildland fires. Such occurrences have led to interruptions in power or communication in large municipal areas with associated social and political implications as well as increased immediate danger to humans. Unfortunately,...

Author(s): Bret W. Butler, James B. Webb, J. Hogge, Tim Wallace

Year Published: 2015

Type: Document

Conference Proceedings

Voices from the field: wildland fire managers and high-reliability organizing mindfulness

www.nrfirescience.org/resource/12892

Wildland fire management agencies manage wildland fires for resource benefit while protecting firefighter and public safety. Firefighting fatalities and property damaged by wildfires prompt reviews aimed at preventing similar accidents. The principles of high-reliability organizing (HRO) have been used to analyze such unexpected,...

Author(s): David Thomas, Rebekah L. Fox, Carol Miller

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Tribal Engagement roadmap

www.nrfirescience.org/resource/16168

The U.S. Department of Agriculture (USDA), Forest Service is recognized as a leader among Federal land management agencies in partnering collaboratively with American Indian and Alaska Native governments and indigenous communities. The Forest Service Research and Development (R&D) Deputy Area recognizes that working with tribes...

Year Published: 2015

Type: Document

Technical Report or White Paper

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

Measuring wildland fire leadership: the crewmember perceived leadership scale

www.nrfirescience.org/resource/13705

The aims of this research were to develop and test a scale used to measure leadership in wildland firefighting using two samples of USA wildland firefighters. The first collection of data occurred in the spring and early summer and consisted of an online survey. The second set of data was collected towards late summer and early fall...

Author(s): Alexis L. Waldron, David P. Schary, Bradley J. Cardinal

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Trust: a planning guide for wildfire agencies and practitioners - An international collaboration drawing on research and management experience in Australia, Canada, and the United States

www.nrfirescience.org/resource/12551

This planning guide is the outcome of an international collaboration of researchers and practitioners/field managers working in communities at risk of wildfire in three countries. Initially, the team of social scientists from Australia, Canada, and the United States utilized the collective research literature to examine factors that...

Author(s): Bruce A. Shindler, Christine Olsen, Sarah M. McCaffrey, Bonita McFarlane, Amy Christianson, Tara K. McGee, Allan Curtis, Emily Sharp

Year Published: 2014

Type: Document

Technical Report or White Paper

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

Northern Rocky Mountain Experimental Forests: settings for science, management, and education alliances

www.nrfirescience.org/resource/12911

Society's view of forests and what they produce changed considerably during the latter part of the 20th century. Prior to the 1970s, society believed that forests in the western United States provided a seemingly infinite supply of natural resources and economic prosperity. The public trusted experts to make forest management...

Author(s): Theresa B. Jain, Michael A. Battaglia, Russell T. Graham

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

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

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

Linking environmental research and practice: lessons from the integration of climate science and water management in the western United States

www.nrfirescience.org/resource/12626

Efforts to better connect scientific research with people and organizations involved in environmental decision making are receiving increased interest and attention. Some of the challenges we currently face, however—including complex questions associated with climate change—are unlike most of the environmental issues encountered...

Author(s): Daniel B. Ferguson, Jennifer Rice, Connie Woodhouse

Year Published: 2014

Type: Document

Synthesis, Technical Report or White Paper

From research to policy: The White Cap Wilderness Fire Study

www.nrfirescience.org/resource/16135

On August 18, 1972, an aerial patrol reported a snag burning deep in the Selway-Bitterroot Wilderness in Idaho. Bob Mutch, then a young research forester, traveled to the site the following day for an on-the-ground assessment. It was, Mutch later recalled, a little "nothing fire" that posed no threat. And he was right. Growing to...

Author(s): Diane M. Smith

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Wildland firefighter safety zones: A review of past science and summary of future needs

www.nrfirescience.org/resource/16900

Current wildland firefighter safety zone guidelines are based on studies that assume flat terrain, radiant heating, finite flame width, constant flame temperature and high flame emissivity. Firefighter entrapments and injuries occur across a broad range of vegetation, terrain and atmospheric conditions

generally when they are within...

Author(s): Bret W. Butler

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

Book or Chapter or Journal Article

Bridging natural resource communication boundaries: public perceptions of smoke from wildland fires and forest managers' perspectives of climate change science

www.nrfirescience.org/resource/13479

Land managers of the northern Rocky Mountains and south-central U.S. are challenged with numerous social and ecological changes, many of which are linked to climate change. The work presented here focuses on two important research gaps: 1) managers do not understand public opinions toward smoke from prescribed fires (a necessary...

Author(s): Jarod Blades

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

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

Assessing high reliability practices in wildland fire management: an exploration and benchmarking of organizational culture

www.nrfirescience.org/resource/12444

In an effort to improve organizational outcomes, including safety, in wildland fire management, researchers and practitioners have turned to a domain of research on organizational performance known as High Reliability Organizing (HRO). The HRO paradigm emerged in the late 1980s in an effort to identify commonalities among...

Author(s): Anne E. Black, Brooke Baldauf McBride

Year Published: 2013

Type: Document

Research Brief or Fact Sheet

Safety climate in the US federal wildland fire management community: influences of organisational, environmental, group and individual characteristics

www.nrfirescience.org/resource/12452

This study examined the effects of organisational, environmental, group and individual characteristics on five components of safety climate (High Reliability Organising Practices, Leadership, Group Culture, Learning Orientation and Mission Clarity) in the US federal wildland fire management community. Of particular interest were...

Author(s): Anne E. Black, Brooke Baldauf McBride

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

Trial by fire: Community Wildfire Protection Plans put to the test

www.nrfirescience.org/resource/12430

Research has found that community wildfire protection planning can make significant contributions to wildfire mitigation and preparedness, but can the planning process and resulting Community Wildfire Protection Plans make a difference to wildfire response and recovery? In case studies conducted in four USA communities with...

Author(s): Pamela J. Jakes, Victoria Sturtevant

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

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

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

Social and ecological factors influencing attitudes toward the application of high-intensity prescribed burns to restore fire adapted grassland ecosystems

www.nrfirescience.org/resource/12401

Fire suppression in grassland systems that are adapted to episodic fire has contributed to the recruitment of woody species in grasslands worldwide. Even though the ecology of restoring these fire

prone systems back to grassland states is becoming clearer, a major hurdle to the reintroduction of historic fires at a landscape scale...

Author(s): David Toledo, Michael G. Sorice, Urs P. Kreuter

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

Aboriginal precedent for active management of sagebrush-perennial grass communities in the Great Basin

www.nrfirescience.org/resource/12146

Until recently, most contemporary ecologists have ignored or diminished anecdotal historical accounts and anthropologists' reports about aboriginal fire in the Great Basin. Literature review shows that Indians practiced regular use of fire for many purposes, including the obvious reasons of increasing the availability of desired...

Author(s): Kent J. McAdoo, Brad W. Schultz, Sherman R. Swanson

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

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 Missoula Fire Sciences Laboratory: a 50-year dedication to understanding wildlands and fire

www.nrfirescience.org/resource/16347

In 1960, the USDA Forest Service established the Northern Forest Fire Laboratory (now the Missoula Fire Sciences Laboratory) to find scientific solutions for better managing the nation's wildland resources and to research ways to improve forest fire prevention and suppression. This new state-of-the-art research facility did not...

Author(s): Diane M. Smith

Year Published: 2012

Type: Document
Technical Report or White Paper

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

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

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

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

After-Action Reviews - who conducts them?

www.nrfirescience.org/resource/16401

Reflecting on the links between intentions and outcomes is a key practice of a learning organization (Garvin 2000). The After-Action Review (AAR) is a formal reflection process intended to assist groups in capturing lessons learned from a task. AARs typically ask four questions regarding fire-response operations: (1) what did we set...

Author(s): Anne E. Black, Kathleen Sutcliffe, Michelle Barton

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Firefighter safety zone: the effect of terrain slope of separation distance

www.nrfirescience.org/resource/16930

Perhaps one of the most critical decisions made on wildland fires is the identification of suitable safety zones for firefighters during daily fire management operations. To be effective (timely, repeatable, and accurate), these decisions rely on good training and good judgement. The current safety zone guidelines used in the US (...)

Author(s): Bret W. Butler, Jason M. Forthofer

Year Published: 2010

Type: Document

Conference Proceedings

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

Efforts to update firefighter safety zone guidelines

www.nrfirescience.org/resource/16935

One of the most critical decisions made on wildland fires is the identification of suitable safety zones for firefighters during daily fire management operations. To be effective (timely, repeatable, and accurate), these decisions rely on good training and judgment, but also on clear, concise guidelines. This article is a summary of...

Author(s): Bret W. Butler
Year Published: 2009
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, 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

Challenges to educating the next generation of wildland fire professionals in the United States

www.nrfirescience.org/resource/12448

Over the last 20 years, the duties of US fire professionals have become more complex and risk laden because of fuel load accumulation, climate change, and the increasing wildland-urban interface. Incorporation of fire use and ecological principles into fire management policies has further expanded the range of expertise and...

Author(s): Leda N. Kobziar, Monique E. Rocca, Christopher A. Dicus, Chad M. Hoffman, Neil G. Sugihara, Andrea E. Thode, J. Morgan Varner, Penelope Morgan
Year Published: 2009
Type: Document
Book or Chapter or Journal Article

Silenced by fear: The nature, sources, and consequences of fear at work

www.nrfirescience.org/resource/17078

In every organization, individual members have the potential to speak up about important issues, but a growing body of research suggests that they often remain silent instead, out of fear of negative personal and professional consequences. In this chapter, we draw on research from disciplines ranging from evolutionary psychology to...

Author(s): Jennifer J. Kish-Gephart, James R. Detert, Linda Klebe Trevino, Amy Edmondson
Year Published: 2009
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

The fire environment -- Innovations, management, and policy

www.nrfirescience.org/resource/16904

The 2nd Fire Behavior and Fuels Conference: Fire Environment – Innovations, Management and Policy was held in Destin, FL, March 26-30, 2007. Following on the success of the 1st Fire Behavior and Fuels Conference, this conference was initiated in response to the needs of the National Wildfire Coordinating Group – Fire Environment...

Author(s): Bret W. Butler, Wayne A. Cook

Year Published: 2007

Type: Document

Conference Proceedings

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

A look inside the dynamics of trust: a guide for managers

www.nrfirescience.org/resource/12542

In the United States, federal public land managers are tasked with serving as stewards of land, but also as stewards of the relationships that people have with the land. By assessing the public's trust in the actions of land managers, insight can be gained into how good of a job managers are doing. This paper outlines a number of...

Author(s): Adam Liljeblad, Alan E. Watson, William T. Borrie

Year Published: 2007

Type: Document

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

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

Understanding social influences on wilderness fire stewardship decisions

www.nrfirescience.org/resource/7954

Federal land managers and the public engage in many decisions about stewardship of wilderness in the United States, including decisions about stewardship of fire. To date, social science research lacks a holistic examination of the decision-making context of managers and the public about stewardship of fire inside wilderness and...

Author(s): Katie Knotek

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Wildland fire and fuel management: principles for effective communication

www.nrfirescience.org/resource/11437

In this paper we discuss four principles identified through recent research for effective citizen-agency communication and examine their use in accomplishing fire management objectives. Principles include the following: (1) effective communication is a product of effective planning; (2) both unidirectional (one-way) and interactive...

Author(s): Eric Toman, Bruce A. Shindler

Year Published: 2006

Type: Document

Technical Report or White Paper

Understanding place meanings on the Bitterroot National Forest - A landscape-level assessment of personal and community values

www.nrfirescience.org/resource/7934

Information about human relationships with wilderness is important for wilderness management decisions, including decisions pertaining to the use of wildland fire. In a study about meanings attached to a national forest, local residents were asked to identify places they valued on the forest, why they valued them, and how fuel...

Author(s): Kari Gunderson, Alan E. Watson

Year Published: 2006

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. Mclver, Phil Weatherspoon

Year Published: 2006

Type: Document

Technical Report or White Paper

Integral leadership and signal detection for high reliability organizing and learning

www.nrfirescience.org/resource/15471

In the last ten years, the fire management community has made significant advances in firefighter safety and leadership development. Yet, there is no discernible downward trend in entrapment fatalities. While the complexity of the job and exposure of an increasing number of firefighters to increasingly severe situations has surely...

Author(s): James M. Saveland

Year Published: 2005

Type: Document

Conference Proceedings

The skilled facilitator fieldbook: tips, tools and tested methods for consultants, facilitators, managers, trainers and coaches

www.nrfirescience.org/resource/15840

This fieldbook, a compendium of 62 articles by consultants, facilitators and organizational psychologists, is organized into seven parts that describe in detail the skilled facilitator approach to running meetings and facilitating groups. This approach seeks to understand the core values and assumptions working within groups and to...

Author(s): Roger Schwarz, Anne Davidson, Peg Carlson, Sue McKinney

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

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

Use of human factors analysis for wildland fire accident investigations

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

Deep smarts: how to cultivate and transfer enduring business wisdom

www.nrfirescience.org/resource/15835

This book describes a process of extracting knowledge from inside the heads of people who possess high expertise in their work, and then describes numerous ways this knowledge can be delivered to people with less expertise. People with high expertise are said to have "deep smarts" about their work, a form of work-related...

Author(s): Dorothy Leonard, Walter Swap

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

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

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

Blink: the power of thinking without thinking

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

Wisdom in the Lessons Learned Library: work ethics and firefighter identities in the Fire Orders

www.nrfirescience.org/resource/15474

This paper analyzes historic and contemporary documents about the Ten Standard Fire Orders in the Lessons Learned Center Library and elsewhere, to examine how justifications for these traditional safety rules have changed over time. Using ethical theory as a lens for analysis, the paper shows how the original Fire Orders attempted...

Author(s): J.A. Thackaberry

Year Published: 2005

Type: Document

Conference Proceedings

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

Managing the unexpected in prescribed fire and fire use operations: a workshop on the high reliability organization

www.nrfirescience.org/resource/15461

Fire management, and forest and rangeland fuels management, over the past century have altered the wildland fire situation dramatically, thus also altering the institutional approach to how to deal with the changing landscape. Also, climate change, extended drought, increased insect and disease outbreaks, and invasions of exotic...

Year Published: 2004

Type: Document

Technical Report or White Paper

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

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...

Author(s): Gary Klein

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

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

Wildland fire behavior case studies and analysis: part 2

www.nrfirescience.org/resource/15996

This resource is a special issue of Fire Management Today that includes articles on fire behavior and descriptions of specific large fires that have important lessons in fire fighter safety.

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

Human factors in fire behavior analysis: reconstructing the Dude Fire

www.nrfirescience.org/resource/15482

On the Dude Fire Staff Ride, we retraced the steps of people who were under pressure. Some of those people handled pressure well. Some didn't. For a richer understanding of the Dude Fire, we should focus on what happens when people are overcome by events; then we might be in a better position to prevent similar tragedies in the...

Author(s): Karl E. Weick

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

Injuries, illnesses, and fatalities among wildland firefighters

www.nrfirescience.org/resource/15464

From the text ... "This article discusses factors that are critical to both firefighters and fire managers in ensuring a safe and productive workforce. First, it discusses such items as the work environment, the firefighter workforce, physical fitness, nutrition, work/rest cycles, lifestyle choices, and job requirements. Next, it...

Author(s): Richard Mangan

Year Published: 2002

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

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

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

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

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

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

Learning in action: a guide to putting the learning organization to work

www.nrfirescience.org/resource/15819

Creating a learning organization is a much needed, yet difficult to implement asset for any organization. While most managers agree on the importance of building this skill, few understand how to get started, what tools and techniques are needed, or even how to tell when they have truly created a learning organization. This book...

Author(s): David Garvin

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

FireWorks curriculum featuring ponderosa, lodgepole, and whitebark pine forests

www.nrfirescience.org/resource/11238

FireWorks is an educational program for students in grades 1-10. The program consists of the curriculum in this report and a trunk of laboratory materials, specimens, and reference materials. It provides interactive, hands-on activities for studying fire ecology, fire behavior, and the influences of people on three fire-dependent...

Author(s): Jane Kapler Smith, Nancy E. McMurray

Year Published: 2000

Type: Document

Technical Report or White Paper

Smoke exposure at western wildfires

www.nrfirescience.org/resource/11193

Smoke exposure measurements among firefighters at wildfires in the Western United States between 1992 and 1995 showed that altogether most exposures were not significant, between 3 and 5 percent of the shift-average exposures exceeded occupational exposure limits for carbon monoxide and respiratory irritants. Exposure to benzene and...

Author(s): Timothy E. Reinhardt, Roger D. Ottmar

Year Published: 2000

Type: Document

Technical Report or White Paper

FireWorks: hands-on learning about fire ecology

www.nrfirescience.org/resource/8149

The perpetuation of fire-dependent forests requires an understanding of fire ecology and fire behavior not only by scientists and managers, but also by the public (U.S. Department of Interior and U.S. Department of Agriculture, 1995). FireWorks is a plastic trunk that contains educational materials and lessons designed to increase...

Author(s): Jane Kapler Smith

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

A theory of everything: an integral vision for business, politics, science and spirituality

www.nrfirescience.org/resource/15845

Wilber provides a brief overview of a "Theory of Everything," which attempts to include matter, body, mind, soul, and spirit as they appear in self, culture, and nature. This theory provides an integral vision, which is a more holistic approach to the world in which we live. In order to explain the theory, Wilber

devotes the...

Author(s): Ken Wilber

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

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

Working with emotional intelligence

www.nrfirescience.org/resource/15821

Based on his earlier book, "Emotional Intelligence," Goleman applies years of research to this practical guide on emotional intelligence in organizations. In the first part of the book, Goleman makes a "hard case for soft skills" by arguing that emotional intelligence is paramount to IQ, or expertise, in determining who will...

Author(s): Daniel Goleman

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

Heroic modes: the hidden dynamics of high-stakes situations

www.nrfirescience.org/resource/15829

In this chapter, Kantor and Ober introduce a model for dealing with conflicts that arise when employees are resistant to organizational change. Change situations are high stakes situations that cause greater fear and anxiety than low stakes situations such as everyday conflict. The authors argue that, during high stakes situations,...

Author(s): David Kantor, Steven Ober

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Wildland fire fatalities in the United States: 1990-1998

www.nrfirescience.org/resource/15462

Wildland fire operations are conducted in a high-risk environment. Individuals involved in all aspects of fire management are subject to the dangers of burnovers, vehicle and aircraft accidents, and medical emergencies. Between 1990 and 1998, 133 individuals died while involved in wildland fire activities (Figure 1). These deaths...

Author(s): Richard Mangan

Year Published: 1999

Type: Document

Technical Report or White Paper

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

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

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

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

Wildland firefighter safety awareness study: Phase 3 - implementing cultural changes for safety

www.nrfirescience.org/resource/15478

This Phase III report of the interagency "Wildland Firefighter Safety Awareness" project presents over 200 recommendations for improving the organizational culture, leadership, human factors and external influences that affect wildland firefighter safety. Together they are a set of detailed implementation strategies for meeting the...

Year Published: 1998
Type: Document
Technical Report or White Paper

Improvisation as a mindset for organizational analysis

www.nrfirescience.org/resource/15843

Weick uses the metaphor of jazz improvisation to discuss the way people verbally communicate about organizational improvisation. He argues that the descriptions and processes used to discuss composing on the spur of the moment provide a lexicon for discussing concepts central to organizational theory. Weick places an emphasis on the...

Author(s): Karl E. Weick
Year Published: 1998
Type: Document
Book or Chapter or Journal Article

The power of mindful learning

www.nrfirescience.org/resource/15832

Mindful learning takes place with an awareness of contexts and of the ever-changing nature of information. A mindful approach is distinguished by three characteristics: the continuous creation of new categories, openness to new information, and an implicit awareness of more than one perspective. Learning is hindered by popular...

Author(s): Ellen J. Langer
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

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

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

Wildland firefighter safety awareness study: Phase 2 - setting new goals for the organizational culture, leadership, human factors, and other areas impacting firefighter safety

www.nrfirescience.org/resource/15477

This report summarizes the results of Phase II of a four phase study to examine the Federal wildland firefighting community and to improve firefighter safety. The first phase described the strengths and problem areas of the current organizational culture, and considered leadership and accountability issues, human factors, and...

Year Published: 1996

Type: Document

Technical Report or White Paper

Wildland firefighter safety awareness study: Phase 1 - identifying the organizational culture, leadership, human factors, and other issues impacting firefighter safety

www.nrfirescience.org/resource/15475

There are many characterizations of wildland firefighters and their work culture. These characterizations vary across all levels of organizations, jurisdictions and types of jobs. As closely held as these perceptions are, as confident as each of us is with our own perceptions--it begs the question of what a systematic look at...

Year Published: 1996
Type: Document
Technical Report or White Paper

Fast, inexpensive fireline construction

www.nrfirescience.org/resource/11511

Anyone who has ever tried building fireline on rocky land knows there has been a need for an inexpensive, efficient piece of equipment to do this job. We've recently invented a simple fireline plow to build fireline in such terrain. Fireline construction with this plow makes less of an impact on the environment, and it may cost less...

Author(s): Nathan P. Arno, Stephen F. Arno

Year Published: 1996

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

Attitude of wisdom: the experience component in wildland firefighter decisions

www.nrfirescience.org/resource/15476

Atwood notes that while managers must adopt a passion for safety, the true test is on the fire line. Supervisors are in charge of making decisions that ultimately put safety first, or not. Atwood argues that improvement will not come from the top down, or the outside in, and that firefighting experience is the most critical...

Author(s): George Atwood

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Analysis of escape efforts and personal equipment on the South Canyon Fire

www.nrfirescience.org/resource/15469

This article is a detailed reconstruction of firefighter behavior and personal protective equipment use on the South Canyon Fire. Putnam reveals two failures that contributed to the deaths of 14 firefighters. First, many firefighters held onto their tools and packs during the escape effort. This slowed them down...

Author(s): Ted Putnam

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Occupational Safety and Health Administration's investigation of the South Canyon fire, February 8, 1995

www.nrfirescience.org/resource/15466

This document is a letter to Jack Ward Thomas, Chief of Forest Service, from Joseph A. Dear, Assistant Secretary OSHA, outlining the findings of the Occupational Safety and Health Administration's investigation of the South Canyon fire, February 8, 1995.

Author(s): Joseph A. Dear

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

Addressing the common behavioral element in accidents and incidents

www.nrfirescience.org/resource/15451

Programs aimed at enhancing safety by addressing the proximate cause of an accident only consider a small portion of the safety picture. Merely addressing the proximate cause fails to consider that the system either directly or indirectly trains, reinforces, and even expects employees to demonstrate hazardous behavior. An effective...

Author(s): Curt Braun

Year Published: 1995

Type: Document

Conference Proceedings

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

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Creating a passion for safety vs. management oversight & inspection

www.nrfirescience.org/resource/15472

I was disappointed with the OSHA report of the South Canyon Fire. My feelings are not the result of any need to defend my agency (USDA Forest Service). In another time and place, I thought the OSHA report following the death of Bill Martin (a smokejumper who died in a training jump) was right on target. In that instance I was...

Author(s): James M. Saveland

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

The collapse of decision making and organizational structure on Storm King Mountain

www.nrfirescience.org/resource/15470

Stress, fear, and panic predictably lead to the collapse of clear thinking and organizational structure. While these psychological and social processes have been well studied by the military and the aircraft industry (Cockpit Resource Management) (Weick 1990 and Wiener, Kanki, and Helmrich 1993), the wildland fire community has not...

Author(s): Ted Putnam

Year Published: 1995

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

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

The fifth discipline fieldbook: strategies and tools for building a learning organization

www.nrfirescience.org/resource/15842

This fieldbook, though dated, remains an excellent resource for anyone interested in using the principles of learning organizations in a field setting. It is a companion to Senge's book, "The Fifth Discipline: The Art and Practice of the Learning Organization". The fieldbook is a series of notes, reflections, and exercises...

Author(s): Peter Senge, Art Kleiner, Charlotte Roberts, Richard Ross, Bryan Smith

Year Published: 1994

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

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

Communities of commitment: the heart of learning organizations

www.nrfirescience.org/resource/15813

In this article, Kofman and Senge explore shifts in contemporary management principles. They argue that the common organizational complaints of reactivity, competition, and fragmentation are larger societal issues. These problems cannot simply be solved, but need to be dissolved through a new way of thinking, feeling, and being....

Author(s): Fred Kofman, Peter Senge

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

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

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

Putting the balanced scorecard to work

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

Mann Gulch fire: a race that couldn't be won

www.nrfirescience.org/resource/11196

The Mann Gulch fire, which over ran 16 firefighters in 1949, is analyzed to show its probable movement with respect to the crew. The firefighters were smokejumpers who had parachuted near the fire on August 5, 1949. While they were moving to a safer location, the fire blocked their route. Three survived, the foreman who ignited...

Author(s): Richard C. Rothermel

Year Published: 1993

Type: Document

Technical Report or White Paper

The balanced scorecard: measures that drive performance

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

Lookouts, communication, escape routes, safety zones

www.nrfirescience.org/resource/15460

In a presentation to the USDA Forest Service's national Fire and Aviation Staff, Gleason provides a clear overview of his proposed Lookouts, Communication, Escape Routes, Safety Zones (LCES) method of training firefighters for greater safety. After defining LCES, he discusses how it should be implemented on the ground. He emphasizes...

Author(s): Paul Gleason

Year Published: 1991

Type: Document

Management or Planning Document

The fifth discipline

www.nrfirescience.org/resource/15814

This book takes a systems approach to organizational learning. Senge argues that "a learning organization is a place where people are continually discovering how they create reality. And how they can change it". This book explains why a learning organization is important and describes how to create one. The book is divided into...

Author(s): Peter Senge

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

Benchmarking: the search for industry best practices that lead to superior performance

www.nrfirescience.org/resource/15816

Organizations need reliable ways to adjust business practices when work conditions change. A proven method of successfully learning and applying organizational best practices is through a process called benchmarking. This book introduces the benchmarking process by showing how to: 1) structure and conduct investigations, 2) analyze...

Author(s): Robert C. Camp

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. Shoemaker

Year Published: 1989

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

Enacted sensemaking in crisis situations

www.nrfirescience.org/resource/16266

Crisis situations are often complicated by the very behaviors people use to manage crisis. Enactment suggests that how people think about the work they do shapes how they behave toward that work. This process allows people to see certain aspects of a situation while being blind to others. Enactment influences the course of a crisis...

Author(s): Karl E. Weick

Year Published: 1988

Type: Document

Book or Chapter or Journal Article

Fire Management Notes

www.nrfirescience.org/resource/15997

This issue of Fire Management Notes contains articles on fire shelters, fire behavior, the Butte Fire (Idaho 1985), crew mobilization, and using prescribed fire.

Year Published: 1986

Type: Document

Book or Chapter or Journal Article

Locating suppression resources by travel times to wildfires

www.nrfirescience.org/resource/11472

Two mathematical models are given to determine the best locations for initial attack resources in terms of travel time: a linear programming model and a statistical model. An example for the Clearwater National Forest in Idaho illustrates some of the differences between the two models.

Author(s): Romain Mees

Year Published: 1986

Type: Document

Research Brief or Fact Sheet

Lake Mountain Fire Entrapment: report on fire shelter deployment

www.nrfirescience.org/resource/15993

This report analyzed the events leading up to the Lake Mountain Fire entrapment in the Salmon National Forest, Idaho, in 1985. The authors looked at the fire and activities in terms of the 10 standard fire fighting orders and the 13 shout-out conditions and developed recommended actions to prevent fire shelter deployment...

Author(s): Dave Dahl, Jim Sweeney, Roy Keck

Year Published: 1985

Type: Document

Management or Planning Document

Fire Review of the 1985 Log Tom Fire Complex (Butte Fire)

www.nrfirescience.org/resource/15987

This report reviews the Long Tom Fire Complex. The review team identified 11 issues and provided alternatives for them to reduce suppression costs, improve suppression efficiency, and minimize resource impacts on future large fires in the Salmon River area.

Author(s): Jerry Monesmith, Dick Flannelly, Bert Strom, Jim Lawrence

Year Published: 1985

Type: Document

Management or Planning Document

Lake Mountain Fire Entrapment: incident report

www.nrfirescience.org/resource/15994

This is a report summary that includes conclusions, recommendations, and interview from the safety officer on the fire entrapment incident in the Salmon National Forest on July 4, 1985.

Year Published: 1985

Type: Document

Management or Planning Document

Butte Fire Entrapment

www.nrfirescience.org/resource/15989

This pdf contains two letters and a record of the findings, interviews, and analysis of the use of fire shelters in the Butte Fire in Idaho in 1985.

Author(s): John A. Hafterson

Year Published: 1985

Type: Document

Management or Planning Document

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

Indian fires in the pre-settlement forests of western Montana

www.nrfirescience.org/resource/12043

Presents preliminary results of a two-year study examining the pattern of Indian fires in western Montana's lower elevation forests. Interviews and historic journals were used to reconstruct the characteristics of aboriginal burning. Fire scar data from paired stands indicate substantial differences in fire frequency between Indian...

Author(s): Stephen W. Berrett

Year Published: 1980

Type: Document

Conference Proceedings

Organizational factors in fire prevention: roles, obstacles, and recommendations

www.nrfirescience.org/resource/11471

Problems being encountered in implementing fire prevention programs were explored by studying the organization for fire prevention at the Fish Lake, Uinta, and Wasatch National Forests in Utah. The study focused on role congruency in fire prevention activities and on the social and organizational obstacles to effective programs. The...

Author(s): John R. Christiansen

Year Published: 1976

Type: Document

Technical Report or White Paper

Victims of groupthink: a psychological study of foreign-policy decisions and fiascoes

www.nrfirescience.org/resource/16221

According to Janis, groupthink occurs when "members of any small cohesive group tend to maintain esprit de corps by unconsciously developing a number of shared illusions and related norms that interfere with critical thinking and reality testing". Groupthink can lead to group members making faulty decisions together because they...

Author(s): Irving L. Janis

Year Published: 1972

Type: Document

Book or Chapter or Journal Article

Death in Blackwater Canyon

www.nrfirescience.org/resource/11494

On August 21, 1937, the tragic Blackwater Fire caused the death of 15 firefighters, burning approximately 1,700 acres of National Forest System lands on the Shoshone National Forest, near Cody, Wyoming. An electrical storm occurred in the general vicinity of Blackwater Creek on Wednesday, August 18th causing a fire, which was not...

Author(s): Erle Kauffman

Year Published: 1937

Type: Document

Book or Chapter or Journal Article

Burn Boss Story: Lessons from the Twin Prescribed Fire Escape

www.nrfirescience.org/resource/16037

This 37-minute video summarizes Twin Prescribed Fire Burn Boss Trainee James Pettit's "lessons learned" presentation to the 2010 Southern Region Burn Boss Workshop.

Type: Media

Video

Wildland Fire Leadership Development Program

www.nrfirescience.org/resource/16477

The purpose of this group is to promote cultural change in the workforce and emphasize the importance of leadership concepts in the wildland fire service by providing educational and leadership development opportunities. The website provides several different opportunities to grow in leadership skills.

Type: Website

Website

Butte Fire Shelter Deployment

www.nrfirescience.org/resource/15981

On August 29th, 1985, seventy three firefighters deployed their fire shelters on the Butte fire in Idaho. This video gives a description of the events and conditions leading up to this fire and the fire shelter deployments in the Wallace Creek drainage of Idaho.

Type: Media

Video

Dude Fire Staff Ride

www.nrfirescience.org/resource/16008

Dude Fire Staff Ride - National Advanced Fire and Resource Institute 1998 - - Re-released in 2005 from 1998 fire behavior analyst workshop that focused on this tragedy in a wildland-urban interface wildfire. This was first use of a Staff Ride for examining wildfire fighting and opportunities for learning from the Dude fire...

Type: Media

Video

American burning: the Yarnell Hill fire tragedy and the nation's wildfire crisis

www.nrfirescience.org/resource/14305

On June 30, 2013, 19 firefighters from the Granite Mountain Hotshots were killed battling a wildfire near Yarnell, Arizona. Huge questions remain about the last moments of their lives. Why did they move out of a safe area in their final minutes of life? Why did the fire move so quickly? Could their deaths have been prevented? The...

Type: Media

Video

Smoke Management and Air Quality for Land Managers: An Online Training Resource

www.nrfirescience.org/resource/57

Smoke Management and Air Quality for Land Managers is meant for those who are looking for a tutorial on smoke management and air quality. The refresher is comprised of four lessons, each of which can be completed in about half an hour; however, links and interactions allow further investigation of several topics.

Type: Website

Online Course

2015 WFSTAR: Tools for Communication

www.nrfirescience.org/resource/16074

This 10 minute video covers five communication tools that fire fighters often need to communicate with each other, the public and private sectors, disaster relief victims, co-responders, the media, and others.

Type: Media

Video

Why big blazes are burning up budgets and landscapes

www.nrfirescience.org/resource/15513

In 1995, the U.S. Forest Service spent 16 percent of its total budget on fighting fires. Today, it's 52 percent and growing. This article explains why the costs have risen so dramatically and gives insights on the change in the fire-fighting decision-making process.

Type: Media

Webinar

Latest research on estimating safety zones

www.nrfirescience.org/resource/13343

Bret Butler, of the Fire Lab in Missoula, addresses the problem stated in the IRPG, of how to calculate the increase in Safety Zone sizes when considering slope and wind. Currently, there is a beta version Safety Zone Calculator android app available for testing and feedback. Contact Bret Butler if interested at: [bwbutler@fs.fed...](mailto:bwbutler@fs.fed.gov)

Type: Media

Video

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

Christopher O'Connor (for Dave Calkin) - A systems view of wildfire management (Opening Plenary)

www.nrfirescience.org/resource/16192

This 25 minute presentation was delivered for Dave Calkin by Kit O'Connor at the 3rd Southwest Fire Ecology Conference & Applied Fire Science Workshop in Tucson, Arizona, on November 29, 2016. It covers management costs of firefighting, modeling of fuels, structure loss, and much more, from a systems approach.

Type: Media

Video

Decision making for prescribed fire and fire use managers

www.nrfirescience.org/resource/14142

Learning in Action author David Garvin shares effective decision-making skills for fire managers in this 53-minute video.

Type: Media

Video

The Watchout Situations (2013 Refresher)

www.nrfirescience.org/resource/16069

This six minute video covers the history and a story covering the 18 Watchout Situations in wildland firefighting.

Type: Media

Video

Cramer Fire Staff Ride

www.nrfirescience.org/resource/16005

This 48-minute video-a tribute to firefighters Shane Heath and Jeff Allen who lost their lives on the 2003 Cramer Fire-tells the story of the learning and healing that occurred on the 2012 Cramer Fire Staff Ride.
Type: Media

Video

Understanding Human Error Part 4

www.nrfirescience.org/resource/16031

Sidney Dekker helps you understand a new way of dealing with a perceived 'human error' problem in your organization. This module covers why we might revert to the old view.
Type: Media

Video

Human Performance & Innovation and Organizational Learning

www.nrfirescience.org/resource/16398

The mission of the Human Performance Research, Development & Application (RD&A) is to improve the health, safety, performance, and resilience of the Forest Service at individual, team, and organizational scales. Its objective reflects recognition that risk (broadly defined as potential for unwanted outcome) includes both...

Type: Website

Website

Why were they entrapped? Lessons from the "near miss" Madison Arm fire entrapment

www.nrfirescience.org/resource/14121

How did two engine crews become entrapped on the Madison Arm Fire? This is a story of survival inside the transition from initial to extended attack.

Type: Media

Video

Wildfire! Preventing Home Ignitions

www.nrfirescience.org/resource/16061

Wildfire! Preventing Home Ignitions is a 19-minute video available from the Rocky Mountain Research Station. This program tells you how a wildfire can ignite your home. A 'home ignition zone,' the area that includes a home and its immediate surroundings, determines a home's ignition resistance during a severe wildfire. Some of the...

Type: Media

Video

Mike Friend: one firefighter's account of thinking ahead and surviving, Part 2

www.nrfirescience.org/resource/13030

This is the second part of a two-part video featuring a first-person account of a fire shelter deployment on the 2005 I-90 Tarkio Fire that focuses on human factors.

Type: Media

Video

Deployment Story: Little Venus Fire

www.nrfirescience.org/resource/16003

Fire shelter deployment on the Little Venus Fire.

Type: Media

Video

Understanding Human Error Part 2

www.nrfirescience.org/resource/16029

Sidney Dekker helps you understand a new way of dealing with a perceived 'human error' problem in your organization. This module talks about how an investigation of human error with old and new views differs.

Type: Media

Video

Conducting Effective After Action Reviews (AAR) - Part 2

www.nrfirescience.org/resource/16393

This 25-minute video produced by the Wildland Fire and Lessons Learned Center and the NWCG Leadership Development Program covers eight aspects of the After Action Review (AAR) process to aid managers in conducting an AAR in various situations. The eight topics covered in this video include: How to set up an AAR; restating a point;...

Type: Media

Video

Lessons from the Woodview fire burnover

www.nrfirescience.org/resource/14118

This video examines a near miss that occurred when inadequate planning and communication put an initial attack crew in the middle of a crowning fire without a viable escape route.

Type: Media

Video

Dude Fire - Perryville Fire Crew Entrapment

www.nrfirescience.org/resource/16000

Firefighters discuss the entrapment of the Perryville Fire Crew on the 1990 Dude fire. This is raw video footage from News Channel 12.

Type: Media

Video

Just Culture Part 3

www.nrfirescience.org/resource/16027

In Module 3 of this short course, Prof Dekker explains the promise and potential of restorative justice in your organization.

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

S-110 Basic Wildland Fire Orientation

www.nrfirescience.org/resource/16085

This 14 minute video is an overview of the people and resources needed for wildland firefighting. Video goal is to prepare firefighter for success in their first assignment on a fire.

Type: Media

Video

Diane Hutton- Know When to Go Home

www.nrfirescience.org/resource/16045

Diane Hutton tells how she and her crew filled in their knowledge gaps while conducting a multi-year burn plan on the Beaverhead National Forest at the Big Hole National Monument battlefield.

Type: Media

Video

The Importance of Identity

www.nrfirescience.org/resource/16773

In this podcast, we hear from Travis Dotson--a regular on the podcast--and Brit Rosso, the Director of the Wildland Fire Lessons Learned Center and podcast newcomer. In the discussion, we try to make sense of the super complex and convoluted topic of "Identity." Travis and Brit tackle a wide range of topics, including: -What does it...

Type: Media

Podcast

Just Culture Part 2

www.nrfirescience.org/resource/16025

In this module, Prof Dekker explains the problems of a retributive just culture and the protections necessary if you want it to work. He covers definitions, retribution, negligence, decision trees, protections, and difference with restorative justice.

Type: Media

Video

ScienceCasts: Taking the Wild out of Wildfire

www.nrfirescience.org/resource/16083

A new NASA-funded tool is taking some of the 'wild' out of wildfires by making it possible for U.S. fire managers to better spot and track direction of dangerous blazes. Visit <http://science.nasa.gov/> for more.

Type: Media

Video

Human performance and risk management

www.nrfirescience.org/resource/12863

A webinar on the roles individuals, leaders and organizations have in improving performance. Historically human performance has been seen as a simply looking at how the individual workers behave. The focus of post incident analysis, for example, has been to judge actions and decisions based on the result or outcome; essentially, if...

Type: Media

Webinar

Interview with Tom Harbour - Part three of three

www.nrfirescience.org/resource/13868

Tom Harbour, National Director of Fire and Aviation Management for the U.S. Forest Service, was interviewed by Bill Gabbert for Wildfire Today, December 14, 2015. In this final installment of the three part series, Mr. Harbour talked about the Cantwell-Hastings Bill that requires a criminal investigation of firefighter...

Type: Media

Video

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

The Wildfire Within: Firefighter Perspectives on Gender and Leadership in Wildland Fire

www.nrfirescience.org/resource/16758

This project utilized a feminist appreciative approach to Action Research to facilitate a conversation about gender and leadership within the British Columbia Wildfire Service (BCWS). The research question was, "How might understanding gender and leadership support excellence in the BCWS?" This study found that amongst diverse...

Type: Media

Webinar

Look Up, Look Down, Look Around

www.nrfirescience.org/resource/15995

Look Up, Look Down, Look Around is a fire environment factors and fire behavior training video, released in 1993. It was assigned NFES #2244, and PMS #427. It contains several chapters on fuel characteristics that are important to fire behavior.

Type: Media

Video

Managing the Unexpected - Part 1

www.nrfirescience.org/resource/16022

Managing the Unexpected - Part 1 - National Advanced Fire and Resource Institute 2005 - - Part 1 - Overview of High Reliability Organizations.

Type: Media

Video

Living with Fire - Wildland Fire Science

www.nrfirescience.org/resource/16081

In this 3 minute video released by Oregon State University, fire science experts discuss the impact of fire on wildland as well as society's changing perception of the importance of fire and fire safety. Oregon State is conducting world-class research into all aspects of fire including the immediate and long-term effects of...

Type: Media

Video

The effectiveness of suppression resources in large fire management

www.nrfirescience.org/resource/12826

Wildfire management currently represents over 50 percent of the US Forest Service's total budget. Suppression of large fires represents the single largest category of fire management and typically exceeds \$1 billion annually. In both 2012 and 2013 large fire suppression exceeded the Agency's budget allocations by over \$400...

Type: Media

Webinar

Interview with Tom Harbour - Part one of three

www.nrfirescience.org/resource/13866

Tom Harbour, National Director of Fire and Aviation Management for the U.S. Forest Service, was interviewed by Bill Gabbert for Wildfire Today, December 14, 2015. In this Part 1 of 3, Mr. Harbour talked about his early years, how studying chemical engineering helped him in his USFS job, working with politicians, and what it was like...

Type: Media

Video

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

Building a More Effective Learning Organization

www.nrfirescience.org/resource/16019

Building a More Effective Learning Organization (Shorter Version) - National Advanced Fire and Resource Institute 2005 - - Organizational learning in wildland fire featuring Learning in Action, author David Garvin 2005.

Type: Media

Video

Communications under fire: understanding capacity for effective communication during large-scale wild

www.nrfirescience.org/resource/14837

Communication networks are critical to effective coordination on complex wildfire incidents. This presentation will present research findings examining communication effectiveness in wildfire disaster response networks. Discussion will highlight the role of pre-existing relationships, common institutional affiliations, and...

Type: Media

Webinar

Minimum Impact Suppression Tactics

www.nrfirescience.org/resource/16079

This 22 minute video covers what suppression tactics should be based on, including firefighter and public safety, resource benefits, minimum costs, and resource objectives. Past firefighting protection policy primarily emphasized the need to extinguish all wildland fire ignitions. Today's policy offers a full...

Type: Media

Video

Learning from the Experts: Riva Duncan - Got Conversation?

www.nrfirescience.org/resource/16038

Riva Duncan explains the importance of communication on the fireline. She explains the problems with communication on the Cascade Two Burn where she was the ignition specialist and talks about what should be included in burn plans. She recommends talking with others during the planning process and using high reliability organizing...

Type: Media

Video

Inside the Shelter

www.nrfirescience.org/resource/16011

"Fire Shelter Deployments: Stories and Common Insights" is a program developed by the US Forest Service Missoula Technology and Development Center (MTDC) that will help you understand what you may experience in a fire shelter deployment. The video gives first-hand descriptions of what it was like in the fire shelter during a...

Type: Media

Video

Firewise Virtual Workshop: Understanding How Embers Ignite Roofs in a Wildland Fire

www.nrfirescience.org/resource/16076

Firewise Virtual Workshop: Understanding How Embers Ignite Roofs in a Wildland Fire and How to Make Your Roof More Survivable

Type: Media

Video

Standing Accountable - Cerro Grande Interview

www.nrfirescience.org/resource/16035

In a tv interview, Karen Wade, Reg. Dir., informed the public of Ray Weaver's suspension, covered the next steps in investigation of fire, including a Congressional Senate investigation, and gave a heart-felt message to the people of New Mexico taking responsibility for decisions.

Type: Media

Video

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

Burn boss stories

www.nrfirescience.org/resource/14148

Veteran burn bosses share their stories and firsthand insights.

Type: Media

Video

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

Dude Fire Fatality Case Study

www.nrfirescience.org/resource/16007

In June 1990 a fire in Arizona results in six firefighter fatalities.

Type: Media

Video

Understanding Human Error Part 5

www.nrfirescience.org/resource/16032

Sidney Dekker helps you understand a new way of dealing with a perceived 'human error' problem in your organization. In this module, Dekker talks about counterfactual reactions to human error, or what people could have or should have done to prevent the outcome.

Type: Media

Video

Human and organizational performance: folklore and science

www.nrfirescience.org/resource/14138

This webinar will explore current pervasive mental models about managing performance. Many common practices are at least 50 years behind the science. This webinar explored some of the latest developments in the psychological and social sciences as they apply to improving performance out on the fireline.

Type: Media

Webinar

Wildland Urban Interface Fires: An Overview for Responders

www.nrfirescience.org/resource/16068

This 58 minute video is produced for fire responders to improve knowledge and safety when fighting fires in the wildland-urban interface

Type: Media

Video

First aid for prescribed fire operations

www.nrfirescience.org/resource/13060

This webinar discussed several types of injuries or medical emergencies that could occur during prescribed fire or similar operations. The presenter focused on areas in which a lay rescuer can make a difference by those things they do - or do not do - or those emergencies in which current medical

knowledge has improved our ability...

Type: Media

Webinar

Cramer Fire Case Study (2013 Refresher)

www.nrfirescience.org/resource/16004

Part 1: Past fires and lessons learned in the Salmon River Breaks of the Salmon-Challis NF. Part 2: Cramer Fire case study of the fire that killed two helitack crew members on July 22, 2003.

Type: Media

Video

Understanding Human Error Part 3

www.nrfirescience.org/resource/16030

Sidney Dekker helps you understand a new way of dealing with a perceived 'human error' problem in your organization . This module covers what new view investigations look at and produce.

Type: Media

Video

Using After-Action Reviews to Build Team Leadership

www.nrfirescience.org/resource/16395

After-action reviews (AARs) are team conversations after an event or incident that help guide learning, best practices, and overall performance of the team. This presentation discusses some of the basics of conducting AARs. In this 10 minute video, Barron covers some of the basics of AARs that can be used in a variety of situations...

Type: Media

Video

Close call - What you can learn from the Ahorn fire shelter deployment

www.nrfirescience.org/resource/14120

A look at the "close call" firefighter shelter deployment that occurred on the Ahorn Fire—focusing on key lessons and effective practices to be learned from this incident. This video from the Wildland Fire Lessons Learned Center.

Type: Media

Video

Firefighter Safety in the Wildland/Urban Interface

www.nrfirescience.org/resource/16060

This presentation is a training video produced by The National Wildland/Urban Interface Fire Protection Program. It covers problems encountered in the wildland-urban interface that complicate the work of firefighters.

Type: Media

Video

Mike Friend: one firefighter's account of thinking ahead and surviving, Part 1

www.nrfirescience.org/resource/13029

This is the first part of a two-part video featuring a first-person account of a fire shelter deployment on the 2005 I-90 Tarkio Fire that focuses on human factors.

Type: Media

Video

Little Venus Fire Shelter Deployment - Part 1

www.nrfirescience.org/resource/16002

This two-part video reviews the 2006 Venus Fire Shelter Deployment — focusing on communication and situational awareness. It covers the problems encountered with radios and not being able to see the location of the fire as the crew started down a drainage. There were no casualties during this deployment. Part 1 of 2.

Type: Media

Video

Understanding Human Error Part 1

www.nrfirescience.org/resource/16028

Sidney Dekker helps you understand a new way of dealing with a perceived 'human error' problem in your organization. This module is an introduction to old view vs. new view ways to approach human error.

Type: Media

Video

Wildland Fire Leadership Development Program Staff Ride Library

www.nrfirescience.org/resource/16392

The intent of this resource is to provide a library of information on significant wildland fire events in order to assist individuals who want to conduct staff rides to those sites and to provide a reference source for individuals who want to develop new staff rides for incidents of local interest. A staff ride consists of three...

Type: Website

Website

A brief introduction to the Facilitated Learning Analysis

www.nrfirescience.org/resource/14050

“Any safety system depends crucially on the willing participation of the workforce, the people in direct contact with the hazards. To achieve this, it is necessary to engineer a reporting culture – an organizational climate in which people are prepared to report their errors... An effective reporting culture depends, in turn, on...

Type: Media

Webinar

Learning from the Experts: Buzz Williams - How Do You Anticipate Routine Surprises?

www.nrfirescience.org/resource/16048

Listen to Buzz as he describes how he uses maps to anticipate routine surprises. Buzz's story might help you to think about what processes you can use to anticipate surprise.

Type: Media

Video

Dude Fire - Ted Putnam with MTDC

www.nrfirescience.org/resource/15999

Ted Putnam with the Missoula Technology and Development Center (MTDC) describes fire shelter and personal protective equipment impacts during an investigation of entrapment and death of 6 firefighters in the June 26, 1990 Dude fire.

Type: Media

Video

Just Culture Part 4

www.nrfirescience.org/resource/16026

In Module 4 of this short course, Prof Dekker talks about the second victim.

Type: Media

Video

The Nature of Americans: Barriers and opportunities to connect the nation with nature

www.nrfirescience.org/resource/16350

What is the state of Americans' connection to nature? How do we overcome disconnection? The Nature of Americans National Report: Disconnection and Recommendations for Reconnection reveals important insights from a study of nearly 12,000 adults, children, and parents, and provides recommendations to open the outdoors for all....

Type: Media

Webinar

The Story Behind the Yellowstone Fires of 198: 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

Learning from the Experts: Ric Carlson - Burning with Optimism

www.nrfirescience.org/resource/16044

Ric Carlson relates one occurrence when his optimism in a burn plan colored his perspective. The video addresses the question of how to guard against the pitfalls of optimism without paralyzing yourself or your unit into inaction.

Type: Media

Video

Examining the Role of Human Dimensions Thinking in Landscape Conservation Planning

www.nrfirescience.org/resource/16768

One of the greatest challenges facing landscape conservation is how to ensure ecosystem-wide conservation goals, such as those articulated in Landscape Conservation Designs, can effectively inform local management plans and actions. Developing feasible conservation goals and useful landscape planning products requires participation...

Type: Media

Webinar

Just Culture Part 1

www.nrfirescience.org/resource/16024

In Module 1 of this short course, Prof Dekker introduces Just Culture.

Type: Media

Video

The Human Physiological effects of Wildland Fire Management

www.nrfirescience.org/resource/16346

This talk was presented as part of the Missoula Fire Sciences Laboratory 2017-2018 Seminar Series. A recording of the talk is available.

Type: Media

Seminar

The Science Behind Forest Fires: How It Happens

www.nrfirescience.org/resource/16082

When heat, oxygen and dry vegetation come together, the result can be a forest fire. Wildfires destroy millions of acres each year in the United States.

Type: Media

Video

Learning from escaped prescribed fire reviews: initial results

www.nrfirescience.org/resource/12861

Through a series of five dialogues sessions with fire managers from across the US (Denver, CO; Portland, OR; Salt Lake City, UT; Tallahassee, FL; and Tucson, AZ), we sought to understand and improve individual and organizational learning from reviews of escaped prescribed fires. Results have influenced the National Wildfire...

Type: Media

Webinar

Wildland Firefighter Safety: 20 Years of Chasing Urine, Blood and Muscle on the Firelines of the West

www.nrfirescience.org/resource/15853

Dr. Brent Ruby will present his informative webinar on the physiological limits of wildland firefighters and how to address energy loss on the fireline. Learn what you can do to help your colleagues when they become fatigued while fighting fire (and what NOT to do).

Type: Media

Webinar

Interview with Tom Harbour - Part two of three

www.nrfirescience.org/resource/13867

Bill Gabbert interviewed Mr. Harbor for Wildfire Today two weeks before his retirement date. In this segment, Mr. Harbour talks about how many firefighters the USFS will have in 2016, tracking firefighters and the location of a flaming front, smokejumpers, the agency's responsibility regarding protecting structures, and the...

Type: Media

Video

Learning from the Experts: Ric Carlson - Building a 'Mac Truck' Burn Plan

www.nrfirescience.org/resource/16042

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 addresses the question of how narrowly focused the prescription window in a prescribed burn should be.

Type: Media

Video

Conducting Effective After Action Reviews (AAR) - Part 1

www.nrfirescience.org/resource/16020

Conducting Effective After Action Reviews (AAR) - Part 1 - National Advanced Fire and Resource Institute 2005 - - Part 1 - The After Action Review of the Horse Creek Prescribed Fire. A simulation exercise video. What was planned? What actually happened? Why did it happen? What can we do next time?

Type: Media

Video

Suppression resource response to fire occurrence: more than a simple problem of supply and demand

www.nrfirescience.org/resource/14873

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...

Type: Media

Seminar

LCES: Lookouts, Communications, Escape Routes, Safety Zones

www.nrfirescience.org/resource/16080

This 20 minute video covers lookouts, communications, escape routes, and safety zones. It was presented by the National Wildfire Coordinating Group in 2003 - NFES 2898 - Course S-134.

Type: Media

Video

Learning From The Experts: Margit Bucher - Another Pair of Eyes

www.nrfirescience.org/resource/16040

In this 9 minute video, Margit Bucher explains how she uses her crew as another pair of eyes and the importance of double checking assumptions that you are working on within the burn plan. The goal of the Learning from the Experts video series is to speed up individual and organizational learning. Project personnel have...

Type: Media

Video

Little Venus Fire Shelter Deployment - Part 2

www.nrfirescience.org/resource/16012

This two-part video reviews the 2006 Venus Fire Shelter Deployment — focusing on communication and situational awareness. Part 2 of 2.

Type: Media

Video

Wildland Fire Lessons Learned Center

www.nrfirescience.org/resource/206

The LLC is a cutting-edge knowledge resource center for the entire wildland fire community. The LLC provides innovative strategies, processes and tools to assist the entire wildland fire community in performing more safely and effectively—using both past and present lessons. The LLC helps the entire wildland fire community use...

Type: Website

Publications List or Library

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