

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

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

Towards improving wildland firefighter situational awareness through daily fire behaviour risk assessments in the US Northern Rockies and Northern Great Basin

www.nrfirescience.org/resource/15489

Wildland firefighters must assess potential fire behaviour in order to develop appropriate strategies and tactics that will safely meet objectives. Fire danger indices integrate surface weather conditions to quantify potential variations in fire spread rates and intensities and therefore should closely relate to observed fire...

Author(s): William Matt Jolly, Patrick H. Freeborn

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

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

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

Communication under fire: communication efficacy during wildfire incidents

www.nrfirescience.org/resource/14170

In this study, researchers analyzed the influence of pre-incident familiarity, stakeholder affiliation, and primary wildfire response/functional role on communication frequency and efficacy during three western U.S. wildfires ignited on U.S. Forest Service land. All fires occurred in wildland/urban interface areas, and involved a...

Author(s): Northwest Fire Science Consortium
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

What information do people use, trust, and find useful during a disaster? Evidence from five large wildfires

www.nrfirescience.org/resource/13211

The communication system through which information flows during a disaster can be conceived of as a set of relationships among sources and recipients who are concerned about key information characteristics. The recipient perspective is often neglected within this system. In this article, we explore recipient perspectives related to...

Author(s): Toddi A. Steelman, Sarah M. McCaffrey, Anne-Lise Knox Velez, Jason Alexander Briefel
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

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

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 L. Miller

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

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

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

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

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

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

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

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

www.nrfirescience.org/resource/8359

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

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article, Synthesis

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

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, Synthesis

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

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

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

An analysis of Dodge's escape fire on the 1949 Mann Gulch Fire in terms of a survival zone for wildland firefighters

www.nrfirescience.org/resource/11020

The Wildland Fire Operations Research Group of FPIInnovations-Feric Division in collaboration with the University of Alberta initiated a project in late 2007 at the request of its stakeholders to examine and define the limits of wildland firefighter safety and survival zones. Part of this project involves examining past wildfire...

Author(s): Martin E. Alexander, Mark Y. Ackerman, Gregory J. Baxter

Year Published: 2009

Type: Document

Conference Proceedings

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

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

Conference Proceedings, Synthesis

Collaborative planning to reduce risk

www.nrfirescience.org/resource/138

Wildland fire knows no political boundaries, nor should efforts to address its risk. Collaboration is not a new idea; many examples of natural resource managers and community groups working together can be found in forest management planning, watershed restoration, and wildland fire suppression (Sturtevant et al. 2005). Direction...

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

Year Published: 2007

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

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

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

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, Management or Planning Document

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

'Brewer fire mystery' discussion

www.nrfirescience.org/resource/8288

Occasionally, Fire Management Today publishes comments from readers on topics of concern, offering authors a chance to respond. Stephen A. Eckert contends that the 'Brewer fire mystery' is not so mysterious. He says that the conditions were ripe for extreme fire behavior, and that under those conditions, the fire quickly went from a...

Author(s): Stephen A. Eckert, Martin E. Alexander

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

Human factors in fire behavior analysis: reconstructing the Dude Fire

www.nrfirescience.org/resource/15482

On the Dude Fire Staff Ride tomorrow, we will retrace 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...

Author(s): Karl E. Weick

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

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

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

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

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

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. Atwood argues that improvement will not come from the top down, or the outside in, and that firefighting experience is the most critical factor in...

Author(s): George Atwood
Year Published: 1996
Type: Document
Book or Chapter or Journal Article

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

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

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

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

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

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

conditions

www.nrfirescience.org/resource/11055

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

Author(s): Martin E. Alexander

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

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

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

Behavior of the life-threatening Butte Fire: August 27-29, 1985

www.nrfirescience.org/resource/8314

On August 29, 1985, 73 firefighters were forced into safety zones, where they took refuge in their fire shelters for 1 to 2 hours while a very severe crown fire burned over them. The incident took place on the Butte Fire on the Salmon National Forest in Idaho. Five firefighters were hospitalized overnight for heat exhaustion, smoke...

Author(s): Richard C. Rothermel, Robert W. Mutch

Year Published: 1985

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, Technical Report or White Paper

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

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 stories

www.nrfirescience.org/resource/14148

Veteran burn bosses share their stories and firsthand insights.

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

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

Debunking social myths in wildland fire

www.nrfirescience.org/resource/12847

As more people live in high fire hazard areas, the active involvement of the public will be central to many efforts to minimize fire risk and improve forest health. One barrier to effectively engaging the public may be that many of the accepted descriptions related to the public and wildfire are based primarily on conventional...

Type: Media

Webinar

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

The how, what, and where of safety zones: recent findings

www.nrfirescience.org/resource/12823

Bret Butler presented a webinar on December 2, 2014. Current safety zone guidelines for wildland firefighters are based on the assumption of flat ground, no wind, and radiative heating only. Recent measurements in grass, shrub and crown fires indicate that convective heating can be significant especially when wind or slope are...

Type: Media

Webinar

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

FIREHouse: The Northwest and Alaska Fire Research Clearinghouse

www.nrfirescience.org/resource/144

FIREHouse provides user-friendly, web-based information about fire science and technology relevant to Washington, Oregon, Idaho and Alaska. For each project posted, the goal is to provide, as applicable, online, searchable access to: (1) project and tool descriptions, contact information and links; (2) on-line publications; (3)...

Type: Website

Website

Catching fire: prescribed burning in Northern California

www.nrfirescience.org/resource/205

Catching Fire tells a compelling story of how a small but committed group of local, tribal, state and federal land managers are bringing back the use of prescribed fire as a tool to protect communities and ecosystems across Northern California. It examines the use of fire by the Karuk Tribe of California, and the connection between...

Type: Media

Video

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

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. What's changed? "Everything," said Matthew Thompson, a research forester who works at the agency's Rocky Mountain Research Station in Fort Collins, Colorado. "The length of the fire season, more..."

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...

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

Webinar

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

www.nrfirescience.org/resource/13081

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

Type: Media

Webinar

National and global fire danger rating systems: development, applications, and improvements

www.nrfirescience.org/resource/14335

Wildland fire potential is best described as a combination of available fuels, suitable weather conditions and sources of ignitions and weather is the most spatially and temporally variable of these three components. Weather variables such as temperature, relative humidity, precipitation and wind speed...

Type: Media

Webinar

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

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

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

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

Smoke management: preparing and informing the public

www.nrfirescience.org/resource/12859

For several months during 2011, wildfires throughout the Southwest Area and Mexico caused air quality impacts on public health across the region, with significant impacts measured hundreds of miles away from individual wildfires. In order to address the emerging issue, a concerted multi-state interagency air quality coordination...

Type: Media

Webinar

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

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

Lessons from the Woodview fire burnover

www.nrfirescience.org/resource/14118

his 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

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

Evacuation planning in the wildland-urban interface

www.nrfirescience.org/resource/12818

The 2012 fire season has already resulted in more fire-caused evacuations than many recent years. This webinar will review traditional and contemporary aspects of evacuation planning. Traditional topics to be covered include warning and response, traffic management, contingency planning, and vulnerable populations....

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

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

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

Rangeland Fire Protection Associations in Oregon and Idaho: Implications for Fire Adaptation and Agency-Community Relationships

www.nrfirescience.org/resource/15508

Rangeland Fire Protection Associations are unique partnerships wherein ranchers and the Bureau of Land Management work together to suppress rangeland wildfires. Using four case studies in Oregon and Idaho, we discuss the value and outcomes of this approach, as well as challenges and future implications for fire adaptation on the...

Type: Media

Webinar

Community preparedness: fire safe councils, county resolutions, and firewise practices

www.nrfirescience.org/resource/13318

In this video, discussions focused on fire management in the Wildland Urban Interface, firefighter safety, and homeowner responsibilities and safety. Alan Tresemer, Captain, Painted Rocks Fire and Rescue Company, Sonny Stiger, retired USFS Fire and Fuels Management Specialist, Steve Arno, retired USFS research forester, and Bob...

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

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

Energy transport in fires and how it relates to firefighter safety zones

www.nrfirescience.org/resource/14334

All wildland firefighters are required to identify a location to which they can retreat in the event that fire conditions threaten their safety. These areas termed safety zones. However it was not until the work by Butler and Cohen in 1995 that any quantitative information existed for actually gauging the...

Type: Media

Webinar

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