

Post-fire water-quality response in the western United States

www.nrfirescience.org/resource/17502

Wildfires are increasing in size and severity in forested landscapes across the Western United States. Not only do fires alter land surfaces, but they also affect the surface water quality in downstream systems. Previous studies of individual fires have observed an increase in various forms of nutrients, ions, sediments and metals...

Author(s): Ashley J. Rust, Terri S. Hogue, Samuel Saxe, John McCray

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Rapid response tools and datasets for post-fire modeling: linking earth observations and process-based hydrological models to support post-fire remediation

www.nrfirescience.org/resource/15538

Post-wildfire flooding and erosion can threaten lives, property and natural resources. Increased peak flows and sediment delivery due to the loss of surface vegetation cover and fire-induced changes in soil properties are of great concern to public safety. Burn severity maps derived from remote sensing data reflect fire-induced...

Author(s): Mary Ellen Miller, Michael Billmire, William J. Elliot, Kevin A. Endsley, Peter R. Robichaud

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Rapid-response tools and datasets for post-fire remediation: linking remote sensing and process-based hydrological models

www.nrfirescience.org/resource/14641

Post-wildfire flooding and erosion can threaten lives, property and natural resources. Increased peak flows and sediment delivery due to the loss of surface vegetation cover and fire-induced changes in soil properties are of great concern to public safety. Burn severity maps derived from remote sensing data reflect fire-induced...

Author(s): Mary Ellen Miller, William J. Elliot, Peter R. Robichaud, Kevin A. Endsley

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Vegetation response to burn severity, native grass seeding, and salvage logging

www.nrfirescience.org/resource/13422

As the size and extent of wildfires has increased in recent decades, so has the cost and extent of post-fire management, including seeding and salvage logging. However, we know little about how burn severity, salvage logging, and post-fire seeding interact to influence vegetation recovery long-term. We sampled understory plant...

Author(s): Penelope Morgan, Marshall Moy, Christine A. Droske, Leigh B. Lentile, Sarah A. Lewis, Peter R. Robichaud, Andrew T. Hudak, Christopher Jason Williams

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Assessing soil and vegetation recovery following the 2005 School Fire, Umatilla National Forest - 10-year update

www.nrfirescience.org/resource/12811

Following the 2005 School Fire which burned ~ 50,000 acres across forest and grasslands, managers

were particularly concerned with treating severely burned areas to mitigate weed spread and to limit soil erosion. Various mulching treatments (wheat straw, wood strand, and hydromulch) were implemented to control...

Author(s): Peter R. Robichaud, Penelope Morgan, Leigh B. Lentile, Sarah A. Lewis, Andrew T. Hudak, Deborah S. Page-Dumroese

Year Published: 2015

Type: Document

Research Brief or Fact Sheet

Rapid response tools and datasets for post-fire modeling: linking earth observations and process-based hydrological models to support post-fire remediation

www.nrfirescience.org/resource/13466

Preparation is key to utilizing Earth Observations and process-based models to support post-wildfire mitigation. Post-fire flooding and erosion can pose a serious threat to life, property and municipal water supplies. Increased runoff and sediment delivery due to the loss of surface cover and fire-induced changes in soil...

Author(s): Mary Ellen Miller, Michael Billmire, William J. Elliot, Kevin A. Endsley, Peter R. Robichaud

Year Published: 2015

Type: Document

Conference Proceedings

A synthesis of post-fire Burned Area Reports from 1972 to 2009 for western US Forest Service lands: trends in wildfire characteristics and post-fire stabilisation treatments and expenditures

www.nrfirescience.org/resource/13010

Over 1200 post-fire assessment and treatment implementation reports from four decades (1970s-2000s) of western US forest fires have been examined to identify decadal patterns in fire characteristics and the justifications and expenditures for the post-fire treatments. The main trends found were: (1) the area burned by wildfire...

Author(s): Peter R. Robichaud, Hakjun Rhee, Sarah A. Lewis

Year Published: 2014

Type: Document

Book or Chapter or Journal Article, Synthesis

Using native annual plants to restore post-fire habitats in western North America

www.nrfirescience.org/resource/12139

Increasing fire frequencies and uncharacteristic severe fires have created a need for improved restoration methods across rangelands in western North America. Traditional restoration seed mixtures of native perennial mid- to late-seral plant species may not be suitable for intensely burned sites that have been returned to an early-...

Author(s): Christopher M. Herron, Jayne L. Jonas, Paul J. Meiman, Mark W. Paschke

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Effectiveness of post-fire Burned Area Emergency Response (BAER) road treatments: results from three wildfires

www.nrfirescience.org/resource/12142

Wildland fires often cause extreme changes in the landscape that drastically influence surface runoff and soil erosion, which can impact forest resources, aquatic habitats, water supplies, public safety, and forest access infrastructure such as forest roads. Little information is available on the effectiveness of various post-fire...

Author(s): Randy B. Foltz, Peter R. Robichaud
Year Published: 2013
Type: Document
Technical Report or White Paper

Post-fire mulching for runoff and erosion mitigation; Part I: effectiveness at reducing hillslope erosion rates

www.nrfirescience.org/resource/11994

Mulch treatments often are used to mitigate post-fire increases in runoff and erosion rates but the comparative effectiveness of various mulches is not well established. The ability of mulch treatments to reduce sediment yields from natural rainfall and resulting overland flow was measured using hillslope plots on areas burned at...

Author(s): Peter R. Robichaud, Sarah A. Lewis, Joseph W. Wagenbrenner, Louise E. Ashmun, Robert E. Brown
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

Does seeding after wildfires in rangelands reduce erosion or invasive species?

www.nrfirescience.org/resource/12132

Mitigation of ecological damage caused by rangeland wildfires has historically been an issue restricted to the western United States. It has focused on conservation of ecosystem function through reducing soil erosion and spread of invasive plants. Effectiveness of mitigation treatments has been debated recently. We reviewed recent...

Author(s): David A. Pyke
Year Published: 2013
Type: Document
Book or Chapter or Journal Article, Synthesis

Assessing the success of postfire reseeding in semiarid rangelands using terra MODIS

www.nrfirescience.org/resource/11489

Successful post-fire reseeding efforts may aid rangeland ecosystem recovery by rapidly establishing a desired plant community and thereby reducing the likelihood of infestation by invasive plants. While the success of post-fire remediation is critical, few efforts have been made to leverage existing geospatial technologies to...

Author(s): Fang Chen, Keith T. Weber, John L. Schnase
Year Published: 2012
Type: Document
Book or Chapter or Journal Article

Recent trends in post-wildfire seeding in western US forests: costs and seed mixes

www.nrfirescience.org/resource/8284

Broadcast seeding is one of the most commonly used post-fire rehabilitation treatments to establish ground cover for erosion control and mitigation of non-native plant species invasions. Little quantitative information is available on overall trends of post-fire seeding expenditures and seed mixes used over time in forested...

Author(s): Donna Peppin, Peter Z. Fule, Carolyn Hull Sieg, Jan L. Beyers, Molly E. Hunter, Peter R. Robichaud
Year Published: 2011
Type: Document
Book or Chapter or Journal Article, Synthesis

Does seeding after severe forest fires in western USA mitigate negative impacts on soils and plant communities?

www.nrfirescience.org/resource/11501

Broadcast seeding is one of the most widely used post-wildfire emergency response treatments intended to reduce soil erosion, increase vegetative ground cover, and minimize establishment and spread of non-native plant species. However, seeding treatments can also have negative effects such as competition with recovering native...

Author(s): Donna Peppin, Peter Z. Fule, Jan L. Beyers, Carolyn Hull Sieg, Molly E. Hunter

Year Published: 2011

Type: Document

Synthesis, Technical Report or White Paper

Getting results: measuring post-wildfire erosion control treatment effectiveness

www.nrfirescience.org/resource/11031

In the past decade, wildfires around the world have continued to increase in size, severity, and cost. The number of people living in wildland areas has also increased, putting public safety, homes, roads, public infrastructure, water quality, and valued natural resources at risk from wildfire and secondary fire effects. Major...

Author(s): Peter R. Robichaud, Robert E. Brown, Peter M. Wohlgenuth, Joseph W. Wagenbrenner

Year Published: 2011

Type: Document

Conference Proceedings

Post-fire treatment effectiveness for hillslope stabilization

www.nrfirescience.org/resource/12594

This synthesis of post-fire treatment effectiveness reviews the past decade of research, monitoring, and product development related to post-fire hillslope emergency stabilization treatments, including erosion barriers, mulching, chemical soil treatments, and combinations of these treatments. In the past ten years, erosion barrier...

Author(s): Peter R. Robichaud, Louise E. Ashmun, Bruce D. Sims

Year Published: 2010

Type: Document

Synthesis, Technical Report or White Paper

Continued evaluation of post-fire recovery and treatment effectiveness for validation of the ERMiT erosion model (combined proposals P07-2-2-10 and P07-2-3-06) - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11227

The use and cost of post-fire emergency stabilization treatments continues to grow. To help maximize the impact of these treatments, many assessment teams use the Erosion Risk Management Tool (ERMiT) erosion model to predict postfire erosion and mitigation effects. However, despite several completed JFSP projects, the long-term...

Author(s): Peter R. Robichaud, William J. Elliot, Joseph W. Wagenbrenner, Sarah A. Lewis, Louise E. Ashmun, Peter M. Wohlgenuth, Robert E. Brown

Year Published: 2010

Type: Document

Technical Report or White Paper

Post-wildfire seeding in forests of the western United States: an evidence-based review

www.nrfirescience.org/resource/12595

Broadcast seeding is one of the most widely used post-wildfire emergency response treatments intended to reduce soil erosion, increase vegetative ground cover, and minimize establishment and spread of non-native plant species. We conducted an evidence-based review to examine the effectiveness and effects of post-wildfire seeding...

Author(s): Donna Peppin, Peter Z. Fule, Carolyn Hull Sieg, Jan L. Beyers, Molly E. Hunter

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

A synthesis of postfire road treatments for BAER teams: methods, treatment effectiveness, and decisionmaking tools for rehabilitation

www.nrfirescience.org/resource/12622

We synthesized post-fire road treatment information to assist BAER specialists in making road rehabilitation decisions. We developed a questionnaire; conducted 30 interviews of BAER team engineers and hydrologists; acquired and analyzed gray literature and other relevant publications; and reviewed road rehabilitation procedures and...

Author(s): Randy B. Foltz, Peter R. Robichaud, Hakjun Rhee

Year Published: 2009

Type: Document

Synthesis, Technical Report or White Paper

Emergency post-fire rehabilitation treatment effects on burned area ecology and long-term restoration

www.nrfirescience.org/resource/12591

The predicted continuation of strong drying and warming trends in the southwestern United States underlies the associated prediction of increased frequency, area, and severity of wildfires in the coming years. As a result, the management of wildfires and fire effects on public lands will continue to be a major land management...

Author(s): Peter R. Robichaud, Sarah A. Lewis, Robert E. Brown, Louise E. Ashmun

Year Published: 2009

Type: Document

Book or Chapter or Journal Article, Synthesis

Measuring effectiveness of three postfire hillslope erosion barrier treatments, western Montana, USA

www.nrfirescience.org/resource/8389

After the Valley Complex Fire burned 86 000 ha in western Montana in 2000, two studies were conducted to determine the effectiveness of contour-felled log, straw wattle, and hand-dug contour trench erosion barriers in mitigating postfire runoff and erosion. Sixteen plots were located across a steep, severely burned slope, with a...

Author(s): Peter R. Robichaud, Frederick B. Pierson, Robert E. Brown, Joseph W. Wagenbrenner

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Effectiveness of aerial seeding and straw mulch for reducing post-wildfire erosion, north-western Montana, USA

www.nrfirescience.org/resource/8200

Various methods are available to reduce post-wildfire erosion, but there is limited quantitative information on the relative effectiveness of these techniques. We used rainfall simulations to compare

the erosion and runoff rates from adjacent 0.5-m² plots treated with aerial grass seeding and straw mulch with untreated control plots...

Author(s): Amy H. Groen, Scott W. Woods

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Evaluating the effectiveness of contour-felled log erosion barriers as a post-fire runoff and erosion mitigation treatment in the western United States

www.nrfirescience.org/resource/8167

Between 1998 and 2002, six sites were established immediately after large wildfires in the western United States to determine the effectiveness of contour-felled log erosion barriers in mitigating post-wildfire runoff and erosion. In each pair of matched, burned, and small watersheds (1-13 ha), one was treated with contour-felled...

Author(s): Peter R. Robichaud, Joseph W. Wagenbrenner, Robert E. Brown, Peter M. Wohlgenuth, Jan L. Beyers

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Predicting postfire erosion and mitigation effectiveness with a web-based probabilistic erosion model

www.nrfirescience.org/resource/8138

The decision of where, when, and how to apply the most effective postfire erosion mitigation treatments requires land managers to assess the risk of damaging runoff and erosion events occurring after a fire. To meet this challenge, the Erosion Risk Management Tool (ERMiT) was developed. ERMiT is a web-based application that uses the...

Author(s): Peter R. Robichaud, William J. Elliot, Frederick B. Pierson, David E. Hall, Corey A. Moffet

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Protection from erosion following wildfire

www.nrfirescience.org/resource/11053

Erosion in the first year after a wildfire can be up to three orders of magnitude greater than the erosion from undisturbed forests. To mitigate potential postfire erosion, various erosion control treatments are applied on highly erodible areas with downstream resources in need of protection. Because postfire erosion rates generally...

Author(s): Peter R. Robichaud, William J. Elliot

Year Published: 2006

Type: Document

Conference Proceedings

Fire management impacts on invasive plants in the western United States

www.nrfirescience.org/resource/12024

Fire management practices affect alien plant invasions in diverse ways. I considered the impact of six fire management practices on alien invasions: fire suppression, forest fuel reduction, prescription burning in crown-fire ecosystems, fuel breaks, targeting of noxious aliens, and postfire rehabilitation. Most western United States...

Author(s): Jon E. Keeley

Year Published: 2006

Type: Document
Book or Chapter or Journal Article, Synthesis

Assessing the causes, consequences and spatial variability of burn severity: a rapid response proposal - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11149

In this rapid response project, we have collected data on post-fire effects and pre-fire fuels and vegetation from 10 large fires that burned in 2003 and 2004. We use field and remotely sensed data collected during and soon after wildfires to quantify the interactions and spatial variability in fire effects, fuels, fire behavior,...

Author(s): Penelope Morgan, Andrew T. Hudak, Peter R. Robichaud, Kevin C. Ryan

Year Published: 2005

Type: Document

Technical Report or White Paper

Postfire seeding for erosion control: effectiveness and impacts on native plant communities

www.nrfirescience.org/resource/7911

Large, high-severity wildfires remove vegetation cover and expose mineral soil, often causing erosion and runoff during postfire rain events to increase dramatically. Land-management agencies in the United States are required to assess site conditions after wildfire and, where necessary, implement emergency watershed rehabilitation...

Author(s): Jan L. Beyers

Year Published: 2004

Type: Document

Book or Chapter or Journal Article, Synthesis

Postfire management on forested public lands of the western United States

www.nrfirescience.org/resource/7913

Forest ecosystems in the western United States evolved over many millennia in response to disturbances such as wildfires. Land use and management practices have altered these ecosystems, however, including fire regimes in some areas. Forest ecosystems are especially vulnerable to postfire management practices because such practices...

Author(s): Robert L. Beschta, Jonathan J. Rhodes, J. Boone Kauffman, Robert E. Gresswell, G. Wayne Minshall, James R. Karr, David A. Perry, F. Richard Hauer, Christopher A. Frissell

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Quick response small catchment monitoring techniques for comparing postfire rehabilitation treatment effectiveness

www.nrfirescience.org/resource/11000

Increased runoff and erosion commonly occur after wildfires with the onset of precipitation events. Various erosion mitigation treatments are often used after wildfires to reduce flooding and sedimentation. The effectiveness of these treatments has not been well documented in the literature; therefore we undertook a rapid response...

Author(s): Peter R. Robichaud, Robert E. Brown

Year Published: 2003

Type: Document

Conference Proceedings

On the impact of fire suppression and BAER restoration on weeds

www.nrfirescience.org/resource/11043

In 2000, wildfires burned more than 200,000 acres on the Bitterroot National Forest of Montana and nearly 1.5 million acres in the Northern and Intermountain Regions. Management activities associated with fire suppression and post-fire restoration have had the unintentional consequence of promoting invasive weeds. As part of fire...

Author(s): Elaine Kennedy Sutherland

Year Published: 2003

Type: Document

Conference Proceedings

Evaluating the effectiveness of postfire rehabilitation treatments

www.nrfirescience.org/resource/11194

Spending on postfire emergency watershed rehabilitation has increased during the past decade. A west-wide evaluation of USDA Forest Service burned area emergency rehabilitation (BAER) treatment effectiveness was undertaken as a joint project by USDA Forest Service Research and National Forest System staffs. This evaluation covers...

Author(s): Peter R. Robichaud, Jan L. Beyers, Daniel G. Neary

Year Published: 2000

Type: Document

Technical Report or White Paper

Vegetal recovery following wildfire in seeded and unseeded sagebrush steppe

www.nrfirescience.org/resource/11459

Following an August wildfire, sagebrush (*Artemisia L.*)/grass benchlands adjacent to Pocatello, Ida., were seeded with a mixture of exotic wheatgrasses and forbs by rangeland drill in November 1987. The effects of seeding on vegetation development in the immediate postfire years were evaluated by comparing plant density, vegetal...

Author(s): Teresa D. Ratzlaff, Jay E. Anderson

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

The Sleeping Child Burn - 21 years of postfire change

www.nrfirescience.org/resource/11961

In early August 1961, more than 26,000 acres (10,500 ha) of upper montane and subalpine forest on the Bitterroot National Forest burned in a lightning-caused wildfire. At the time, the Sleeping Child Burn represented the single largest forest fire in the Northern Rocky Mountains in more than 20 years. Historically, large wildfires...

Author(s): L. Jack Lyon

Year Published: 1984

Type: Document

Technical Report or White Paper

Burned area emergency response

www.nrfirescience.org/resource/13309

In this video, Marilyn Wildey, Hydrology Technician with the Bitterroot National Forest, describes the Burned Area Emergency Response following the Bitterroot fires of 2000. This was filmed at the Bitterroot National Forest headquarters in Hamilton, MT, which was one of the stops during the Fires of 2000 field trip that was part of...

Type: Media

Video

Post-wildfire seeding in forests of the West: effectiveness, trends over time, and fire management perspectives

www.nrfirescience.org/resource/13037

Dr. Pete Fule presented results from the Joint Fire Science Program (JFSP) project synthesizing existing information on post-wildfire seeding. The webinar covered key findings from an evidence-based systematic review conducted to examine the effectiveness and effects of post-fire seeding treatments on soil stabilization and plant...

Type: Media

Webinar

Linking basic and applied research, multi-resource management, public education, and enforcement: post-fire archeology on the Shoshone National Forest

www.nrfirescience.org/resource/13738

Especially in remote, Wilderness settings, fires produce a complex array of both direct and indirect impacts to heritage resources that creates a cascade of complex research and management issues and opportunities. Over the last decade we have been working to align goals of academic research programs and...

Type: Media

Video

Ten years of post-fire treatment monitoring - Learning about soil and vegetation recovery

www.nrfirescience.org/resource/13234

Following the 2005 School Fire that burned about 50,000 acres of forests and grasslands on the Umatilla National Forest, Washington, managers wanted to limit weed spread and soil erosion in severely burned areas. Various mulch treatments (wheat straw, wood strand, and hydromulch) were used to control erosion on steep slopes above...

Type: Media

Webinar

Hayman fire: short- and long-term geomorphic change and recovery

www.nrfirescience.org/resource/13027

Lee MacDonald, Professor, Colorado State University, Department of Forest, Rangeland, and Watershed Stewardship, discusses geomorphic changes following the Hayman and Schoonover wildfires at the Hayman Fire Science Symposium: Lessons Learned after Ten Years of Recovery, Rehabilitation, and Restoration.

Type: Media

Webinar