The role of previous fires in the management and expenditures of subsequent large wildfires

Previously burned areas can influence the occurrence, extent, and severity of subsequent wildfires, which may influence expenditures on large fires. We develop a conceptual model of how interactions of fires with previously burned areas may influence fire management, fire behavior, expenditures, and test hypotheses using regression...

Author(s): Erin J. Belval, Christopher D. O'Connor, Matthew P. Thompson, Michael S. Hand

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Do fuel treatment costs affect wildfire suppression costs and property damages? An analysis of costs, damages avoided and return on investment - Final Report to the Joint Fire Science Program

Spatial wildfire suppression costs regressions have been re-estimated at a more disaggregated level for the nine Geographic Area Coordination Center (GACC's) regions using five years of data for fires involving National Forests. Results of these revised regression determined that only in the California GACCs did mechanical fuel...

Author(s): Armando Gonzalez-Caban, John B. Loomis, Robin Reich, Douglas B. Rideout, José J. Sánchez

Year Published: 2017

Type: Document

Technical Report or White Paper

Examining heterogeneity and wildfire management expenditures using spatially and temporally descriptive data

Increasing costs of wildfire management have highlighted the need to better understand suppression expenditures and potential tradeoffs of land management activities that may affect fire risks. Spatially and temporally descriptive data is used to develop a model of wildfire suppression expenditures, providing new insights into the...

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Production and efficiency of large wildland fire suppression effort: a stochastic frontier analysis

This study examines the production and efficiency of wildland fire suppression effort. We estimate the effectiveness of suppression resource inputs to produce controlled fire lines that contain large wildland fires using stochastic frontier analysis. Determinants of inefficiency are identified and the effects of these determinants...

Author(s): Hari Katuwal, David E. Calkin, Michael S. Hand

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Fighting fire in the heat of the day: an analysis of operational and environmental conditions of use for large airtankers in United States fire suppression

Large airtanker use is widespread in wildfire suppression in the United States. The current approach to nationally dispatching the fleet of federal contract airtankers relies on filling requests for airtankers to achieve suppression objectives identified by fire managers at the incident level. In general, demand is met if resources...
Author(s): Crystal S. Stonesifer, David E. Calkin, Matthew P. Thompson, Keith Stockmann
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

The economic benefit of localised, short-term, wildfire-potential information
www.nrfirescience.org/resource/13384
Wildfire-potential information products are designed to support decisions for prefire staging of movable wildfire suppression resources across geographic locations. We quantify the economic value of these information products by defining their value as the difference between two cases of expected fire-suppression expenditures: one...
Author(s): Kimberly Rollins, Laine Christman
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Operational wildfire suppression modelling: a review evaluating development, state of the art and future directions
www.nrfirescience.org/resource/13463
Wildfires are an inherent part of the landscape in many parts of the world; however, they often impose substantial economic burdens on human populations where they occur, both in terms of impacts and of management costs. As wildfires burn towards human assets, a universal response has been to deploy fire suppression resources (crews...
Author(s): Thomas J. Duff, Kevin G. Tolhurst
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Are wildfire management resources in the United States efficiently allocated to protect resources at risk? A case study from Montana
www.nrfirescience.org/resource/12909
Federal wildfire management agencies in the United States are under substantial pressure to reduce and economically justify their expenditures. To support economically efficient management of wildfires, managers need better estimates of the resource benefits and avoided damage costs associated with alternative wildfire management...
Author(s): Derek T. O'Donnell, Tyron J. Venn, David E. Calkin
Year Published: 2014
Type: Document
Book or Chapter or Journal Article

The economics of fuel management: wildfire, invasive plants, and the dynamics of sagebrush rangelands in the western United States
www.nrfirescience.org/resource/12134
In this article we develop a simulation model to evaluate the economic efficiency of fuel treatments and apply it to two sagebrush ecosystems in the Great Basin of the western United States: the Wyoming sagebrush steppe and mountain big sagebrush ecosystems. These ecosystems face the two most prominent concerns in sagebrush...

Author(s): Michael H. Taylor, Kimberly Rollins, Mimako Kobayashi, Robin J. Tausch
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

Economic analysis of geospatial technologies for wildfire suppression

Geospatial technologies used to fight large fires are becoming increasingly available, yet no rigorous study exists of their effects on suppression costs or fire losses, nor do we know whether these technologies allow more efficient combination of firefighting assets used to suppress fires. The high cost of these technologies merits...
Author(s): Hayley Hesseln, Gregory S. Amacher, Aaron M. Deskins
Year Published: 2010
Type: Document
Book or Chapter or Journal Article

Challenges of socio-economically evaluating wildfire management on non-industrial private and public forestland in the western United States

Non-industrial private forests (NIPFs) and public forests in the United States generate many non-market benefits for landholders and society generally. These values can be both enhanced and diminished by wildfire management. This paper considers the challenges of supporting economically efficient allocation of wildfire suppression...
Author(s): Tyron J. Venn, David E. Calkin
Year Published: 2009
Type: Document
Book or Chapter or Journal Article

Comparing resource values at risk from wildfires with Forest Service fire suppression expenditures: examples from 2003 western Montana wildfire season

Determining the economic effectiveness of wildfire suppression activities is complicated by difficulties in identifying the area that would have burned and the associated resource value changes had suppression resources not been employed. We developed a case study using break-even analysis for two large wildfires from the 2003 fire...
Author(s): David E. Calkin, Kevin D. Hyde, Krista M. Gebert, J. Greg Jones
Year Published: 2005
Type: Document
Research Brief or Fact Sheet

A technical comparison model: class A foam compared to water as an example

Water has been used to fight fire for centuries. The Bureau of Land Management (BLM) relies on a fleet of over 400 water engines as its primary fire suppression technology in Great Basin fuels. Class A foam is a relatively new approach to fire suppression. The foam concentrates were introduced in the early 1980's (Schlobohm and...
Author(s): Paul M. Schlobohm
Year Published: 1994
Type: Document
Conference Proceedings, Technical Report or White Paper

Estimating cost of large-fire suppression for three Forest Service Regions

The annual costs attributable to large fire suppression in three Forest Service Regions (1970-1981) were estimated as a function of fire perimeters using linear regression. Costs calculated on a per chain of perimeter basis were highest for the Pacific Northwest Region, next highest for the Northern Region, and lowest for the...

Author(s): Eric L. Smith, Armando Gonzalez-Caban

Year Published: 1987

Type: Document

Research Brief or Fact Sheet

Costs of fire suppression forces based on cost-aggregation approach

A cost-aggregation approach has been developed for determining the cost of Fire Management Inputs (FMIs)-the direct fireline production units (personnel and equipment) used in initial attack and large-fire suppression activities. All components contributing to an FMI are identified, computed, and summed to estimate hourly costs....

Author(s): Armando Gonzalez-Caban, Charles W. McKetta, Thomas J. Mills

Year Published: 1984

Type: Document

Technical Report or White Paper

Monoammonium phosphate: effect on flammability of excelsior and pine needles

The study quantified differences between fire-retarding abilities of monoammonium phosphate samples from five different sources. Ponderosa pine needles and aspen excelsior fuel beds were spray-treated with different levels of chemical solutions, dried, and burned under controlled laboratory conditions. Flame spread and energy...

Author(s): Aylmer D. Blakely

Year Published: 1983

Type: Document

Technical Report or White Paper