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New RMRS Series Publications

Climate change on the Shoshone NF

Order 1

Climate change on the Shoshone National Forest, Wyoming: A synthesis of past climate, climate projections, and ecosystem implications. Rice, Janine; Tredennick, Andrew; Joyce, Linda A. 2012. Gen. Tech. Rep. RMRS-GTR-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 60 p.

The Shoshone National Forest (Shoshone) covers 2.4 million acres of mountainous topography in northwest Wyoming and is a vital ecosystem that provides clean water, wildlife habitat, timber, grazing, recreational opportunities, and aesthetic value. The objective of this report is to synthesize the current understanding of the paleo and historical climate of the Shoshone as a reference point, determine what future climates may look like, and what the effects of future climate may be on natural resources. This information allows for the identification of vulnerabilities and information gaps, thereby aiding the development of adaptation tools and strategies.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr264.html

Rothermel's surface fire spread model: Wind adjustment

Order 2

Modeling wind adjustment factor and midflame wind speed for Rothermel's surface fire spread model. Andrews, Patricia L. 2012. Gen. Tech. Rep. RMRS-GTR-266. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 39 p.

Rothermel's surface fire spread model was developed to use a value for the wind speed that affects surface fire, called midflame wind speed. Models have been developed to adjust 20-ft wind speed to midflame wind speed for sheltered and unsheltered surface fuel. In this report, Wind Adjustment Factor (WAF) model equations are given, and the BehavePlus fire modeling system is used to demonstrate WAF calculation and effect on modeled fire behavior. There are differences in implementation of the same basic wind adjustment models in various fire behavior applications. This technical documentation is useful to analysts, system developers, fire weather meteorologists, and those who are interested in model background and foundation.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr266.html

Validating visual disturbance for soil monitoring protocols

Order 3

Validating visual disturbance types and classes used for forest soil monitoring protocols. Page-Dumroese, D.S.; Abbott, A.M.; Curran, M.P.; Jurgensen, M.F. 2012. Gen. Tech. Rep. RMRS-GTR-267. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 17 p.

We describe several methods for validating visual soil disturbance classes used during forest soil monitoring after specific management operations. Site-specific vegetative, soil, and hydrologic responses to soil disturbance are needed to identify sensitive and resilient soil properties and processes; therefore, validation of ecosystem responses can provide information for best management practices in selecting appropriate harvest and site preparation techniques that limit long-term degradation and maintain site productivity and hydrologic function.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr267.html

SIMPPLLE: A dynamic landscape modeling system

Online only

Missoula Fire Sciences Laboratory: 50-year history

Order 4

Hydrology in P-J woodlands

Order 5

RPA Assessment 2010: Future scenarios

Order 6

SIMPPLLE, version 2.5 user's guide. Chew, Jimmie D.; Moeller, Kirk; Stalling, Christine. 2012. Gen. Tech. Rep. RMRS-GTR-268WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 363 p.

Managers can use SIMPPLLE, a spatially interactive, dynamic landscape modeling system, to help define and evaluate desired future conditions at landscape scales, to identify what parts of a landscape are more prone to disturbance processes over a given time frame, and to help design and evaluate different strategies for achieving desired future conditions.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr268.html.

The Missoula Fire Sciences Laboratory: A 50-year dedication to understanding wildlands and fire. Smith, Diane. 2011. Gen. Tech. Rep. RMRS-GTR-270. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 000 p.

This report explores the tradition of research within the Forest Service and how these early research programs, including fire-related research at the Priest River Experimental Forest, contributed to the establishment of the Fire Lab. This history also explores the role played by key events in shaping fire-related research.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr270.html.

Hydrologic processes in the pinyon-juniper woodlands: A literature review. Ffolliott, Peter F.; Gottfried, Gerald J. 2012. Gen. Tech. Rep. RMRS-GTR-271. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 20 p.

Hydrologic processes in the pinyon-juniper woodlands of the western region of the United States are variable because of the inherent interactions among the occurring precipitation regimes, geomorphological settings, and edaphic conditions that characterize the ecosystem. Estimates from studies on interception, infiltration, evapotranspiration, soil moisture storage, hillslope soil erosion, off-site streamflow volumes, sediment yields and transport, and quality of streamflow water are presented.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr271.html.

Future scenarios: A technical document supporting the Forest Service 2010 RPA Assessment. USDA Forest Service. 2012. Gen. Tech. Rep. RMRS-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 34 p.

The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) mandates a periodic assessment of the conditions and trends of the nation's renewable resources on forests and rangelands. The RPA Assessment includes projections of resource conditions and trends 50 years into the future. The 2010 RPA Assessment used a set of future scenarios to provide a unifying framework for resources analyses. Those scenarios, and their associated assumptions about population change, economic growth, land use change, bioenergy, and climate change, are described in this document.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr272.html.

Idaho's forest products industry and timber harvest

Order 7

Idaho's forest products industry and timber harvest, 2006. Brandt, Jason P.; Morgan, Todd A.; Keegan, Charles E., III; Songster, Jon M.; Spoelma, Timothy P.; DeBlander, Larry T. 2012. Resour. Bull. RMRS-RB-12. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 45 p.

This report traces the flow of Idaho's 2006 timber harvest through the primary wood-using industries; describes the structure, capacity, and condition of Idaho's primary forest products industry; and quantifies volumes and uses of wood fiber. Wood products industry historical trends and changes in harvest, production, employment, and sales are also examined.

Online: http://www.fs.fed.us/rm/pubs/rmrs_rb012.html.

Boundary Waters Canoe Area Wilderness

Order 8

The Boundary Waters Canoe Area Wilderness: Examining changes in use, users, and management challenges. Dvorak, Robert G.; Watson, Alan E.; Christensen, Neal; Borrie, William T.; Schwaller, Ann. 2012. Res. Pap. RMRS-RP-91. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 46 p.

This study determines trends in use and user characteristics at the Boundary Waters Canoe Area Wilderness. The average age of visitors has increased significantly, education levels have increased, and visitors remain predominantly male. These findings may need further investigation and future management action to provide opportunities for meaningful wilderness experiences while protecting wilderness character.

Online: http://www.fs.fed.us/rm/pubs/rmrs_rp091.html.

Ninth World Wilderness Congress symposium proceedings

Order 9 (paper copy)

Order 10 (CD)

Science and stewardship to protect and sustain wilderness values: Ninth World Wilderness Congress symposium; November 6-13, 2009; Meridá Yucatán, Mexico. Watson, Alan; Murrieta-Salvidar, Joaquin; McBride, Brooke, comps. 2011. Proceedings RMRS-P-64. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 225 p. **NOTE:** This is available as a paper copy and as a CD. Please indicate which format you prefer.

The symposium on science and stewardship to protect and sustain wilderness values was the largest of multiple symposia held in conjunction with the Congress. The papers contained in this proceedings have been organized into six major topics: (1) empowering young people, (2) promoting involvement of local communities, (3) enhancing transboundary conservation goals, (4) exploring wilderness meanings, (5) monitoring and predicting change, and (6) new directions in wilderness stewardship. Included are papers that address wildland issues in Afghanistan, Antarctica, Canada, Czech Republic, El Salvador, the Gambia, Germany, Honduras, India, Lesotho, Mexico, Namibia, the Netherlands, New Zealand, Nigeria, Philippines, Puerto Rico, Russia, South Africa, Taiwan, Trinidad and Tobago, Uganda, and the United States.

Papers in these proceedings:

The promise of youth service as a global conservation tool. Sloane, Emily R.

The design and implementation of a conservation corps program in Nuristan, Afghanistan. Markus, Danny; Groninger, John W.

The U.S. Forest Service Job Corps 28 Civilian Conservation Centers. Dawson, Larry J.; Bennett, Alicia D.

Indigenous ecotourism in preserving and empowering Mayan natural and cultural values at Palenque, Mexico. Mendoza-Ramos, Adrian; Zeppel, Heather.

From dominance to détente in the face of climate change: Agreements beyond boundaries with indigenous nations. Stumpff, Linda Moon.

- Human-wildlife conflict and its implication for conservation around Bwindi Impenetrable National Park. Aharikundira, Margaret; Tweheyo, M.
- Understanding and building wilderness management partnerships with indigenous peoples and communities. Hansen, Gregory F.
- Maloti Drakensberg Transfrontier Park joint management: Sehlabathebe National Park (Lesotho) and the uKhahlamba Drakensberg Park World Heritage Site (South Africa). Crowson, John M.
- The climate adaptation programs and activities of the Yellowstone to Yukon Conservation Initiative. Francis, Wendy L.
- “Europe’s Wild Heart”—New transboundary wilderness in the middle of the old continent. Kiener, Hans; Krenová, Zdenka.
- Shared wilderness, shared responsibility, shared vision: Protecting migratory wildlife. Meeks, Will; Fox, Jimmy; Roeper, Nancy.
- String of turquoise: The future of Sacred Mountain Peaks in the southwest U.S. and Mexico. Stumpff, Linda Moon.
- The socio-cultural value of New Zealand wilderness. Wray, Kerry.
- El Toro Wilderness, Luqillo Experimental Forest, Puerto Rico. Weaver, Peter L.
- Public perception of the Antarctic Wilderness: Surveys from an educated, environmentally knowledgeable European community. Tin, Tina; Bastmeijer, Kees; O’Reilly, Jessica; Maher, Patrick.
- Wilderness—Between the promise of hell and paradise: A cultural-historical exploration of a Dutch national park. Arts, Koen; Fischer, Anke; van der Wal, René.
- Roles of and threats to Yoruba traditional beliefs in wilderness conservation in southwest Nigeria. Babalola, Fola D.
- Threats and changes affecting human relationships with wilderness: Implications for management. Dvorak, Robert G.; Borrie, William T.; Watson, Alan E.
- Human relationships to fire prone ecosystems: Mapping values at risk on contested landscapes. Gunderson, Kari; Carver, Steve; Davis, Brett H.
- Understanding the transformative aspects of the wilderness and protected lands experience upon human health. Ewert, Alan; Overholt, Jillisa; Voight, Alison; Wang, Chun Chieh.
- Challenges in protecting the wilderness of Antarctica. Tin, Tina; Hemmings, Alan.
- Climate change and ecosystem services: The contribution of and impacts on Federal public lands in the United States. Esposito, Valerie; Phillips, Spencer; Boumans, Roelof; Moulart, Azur; Boggs, Jennifer.
- How do you know things are getting better (or not?): Assessing resource conditions in national parks and protected areas. Nations, James D.
- Monitoring recreational impacts in wilderness of Kamchatka (example of Kronotsky State Natural Biosphere Preserve). Zavadskaya, Anya V.
- Protection of the wilderness and aesthetic values of Antarctica: Geographical information systems (GIS) as a tool. Summerson, Rupert; Tin, Tina.
- The National Landscape Conservation System: A model for long term conservation of significant landscapes. Harmon, Dave; Jarvis, Jeff.
- The verification of wilderness area boundaries as part of a buffer zone demarcation process: A case study from the uKhahlamba Drakensberg Park World Heritage Site. Krüger, Sonja C.; Rusworth, Ian A.; Oliver, Kirsten.
- Protecting marine parks and sanctuaries from aquatic nuisance species releases from ballast during emergency response events. Green, Phyllis A.
- Planning for people? An evaluation of objectives for managing visitors at wildlife refuges in the United States. Brooks, Jeffrey J.; Massengale, Robert.
- Wilderness: An unexpected second chance. Magee, Jerry; Harmon, Dave.
- Examining visitors’ behavioral intentions and behaviors in a Taiwan national park. Li, Cheih-Lu; Chick, Garry E.
- Natural and near natural tropical forest values. Henning, Daniel H.
- Online: http://www.fs.fed.us/rm/pubs/rmrs_p064.html.

**2010 Forest and
Nursery Conservation
Assoc. proceedings**

Order **11**

National proceedings: Forest and Conservation Nursery Associations—2010. Riley, L.E.; Haase, D.L.; Pinto, J.R., tech. coords. 2011. Proc. RMRS-P-65. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

These proceedings are a compilation of 25 papers that were presented at the regional meetings of the forest and conservation nursery associations and the Intertribal Nursery Council meeting in the United States in 2010. Subject matter included marketing strategies, tree improvement programs, nursery certification, fumigation updates, insect and disease management, the target seedling, seed handling, seedling nutrition, seedling culturing, pest management, nursery research and new technology, general nursery topics, native plant production for fisheries restoration, the use of small native plant nurseries in cultural and conservation education, energy conservation and alternative energy sources in nurseries, and the effects of climate change on nursery production.

Papers in these proceedings:

Forests and forestry in Arkansas during the last two centuries. Bragg, Don, C.

Weyerhaeuser in Arkansas. Hearnberger, John.

Panel discussion: Marketing hardwoods at the George O. White State Forest Nursery. Hoss, Greg. Who pays for tree improvement?. Byram, Tom d.; Raley, E.M.

Historical forest seedling production in the southern United States: 2008 to 2009 planting season. Enebak, Scott A.

What's new with nurseries and reforestation projects at the Missoula Technology and Development Center? Simonson, Bob.

Update on soil fumigation: MBr alternatives and reregistration decisions. Enebak, Scott A.

Rehabilitating Afghanistan's natural resources. Hernandez, George.

The use of Proline® (Prothioconazole) to control pitch canker, *Rhizoctonia* foliage blight, and fusiform rust in forest seedling nurseries and efforts to acquire registration. Starkey, tom E.; Enebak, Scott A.

The target plant concept: A history and brief overview. Landis, Thomas D.

Producing the target sees: Seed collection, treatment, and storage. Karrfalt, Robert P.

Morphology targets: What do seedling morphological attributes tell us? Pinto, Jeremiah R.

Seedling root targets. Haase, Diane L.

Repetitive reaction and restitution (R3) induction of drought hardiness in conifer container seedlings. Hodgson, Jol.

Seedling mineral nutrition, the root of the matter. Hawkins, Barbra J.

The role of plant water relations in achieving and maintaining the target seedling. Mexal, John G.; Khadduri, Nabil.

Provenance variability in nursery growth of subalpine fir. Cartwright, Cahrlie, Ying, Cheng.

Targeting hardwoods. Jacobs, Douglass F.

Seedling phenology and cold hardiness: Moving targets. haase, Diane L.

Nursery cultural practices to achieve targets: A case study in western larch irrigation. Davis, Anthony S.; Keefe, Robert F.

Using essential oils to control moss and liverwort in containers. Khadduri, Nabil.

Tissue culture of conifer seedlings—20 years on: Viewed through the lens of seedling quality. Grossnickle, Steven C.

Outplanting strategies—GRO TRZ consulting Incorporated. Farquharson, Dennis.

Target seedling strategies for intensively managed plantations in the Oregon Coast Range. Wall, Mark.

Shrub-steppe species germination trials and survival after outplanting on bare soils. Link, Steven O.; Cruz, Rico O.; Harper, Barbra L.; [and others].

Online: http://www.fs.fed.us/rm/pubs/rmrs_p065.html.

Journals and Other Publications

Obtain the following publications through university libraries, the publisher, or other outlets. Forest Service employees may request these items from the National Forest Service Library at FSLibrary-DocsFC@fs.fed.us or telephone: (970) 498-1205. We have also provided links to electronic copies when available.

Air, water, and aquatic environments

Changes in channel morphology over human time scales.

Buffington, J.M. 2012. In: Church, M.; Biron, P.M.; Roy, A.G., eds. Gravel-bed rivers: processes, tools, environments. Chichester, UK: Wiley: 435-463. Online: <http://www.treesearch.fs.fed.us/pubs/40245>.

Chemical and physical transformations of organic aerosol from the photo-oxidation of open biomass burning emissions in an environmental chamber.

Hennigan, C.J.; Miracolo, M.A.; Hao, W.-M.; [and others]. 2011. Atmospheric Chemistry and Physics. 11: 7669-7686. Online: <http://www.treesearch.fs.fed.us/pubs/40148>.

Developing a model framework for predicting effects of woody expansion and fire on ecosystem carbon and nitrogen in a pinyon-juniper woodland.

Rau, B.M.; Tausch, R.; Reiner, A.; Johnson, D.W.; Chambers, J.C.; Blank, R.R. 2012. Journal of Arid Environments. 76: 97-104. Online: <http://www.treesearch.fs.fed.us/pubs/39878>.

Enhanced sediment delivery in a changing climate in semi-arid mountain basins: Implications for water resource management and aquatic habitat in the northern Rocky Mountains.

Goode, Jaime R.; Luce, Charles H.; Buffington, John M. 2012. Geomorphology. 139-140: 1-15. doi: 10.1016/j.geomorph.2011.06.021. Online: <http://www.treesearch.fs.fed.us/pubs/40244>.

Estimates of carbon stored in harvested wood products from the United States Forest Service Northern Region, 1906-2010.

Stockmann, Keith D.; Anderson, Nathaniel M.; Skog, Kenneth E.; Healey, Sean P.; Loeffler, Dan R.; Jones, Greg; Morrison, James F. 2012. Carbon Balance and Management. 7: 1. Online: <http://www.treesearch.fs.fed.us/pubs/40202>.

Evolution of trace gases and particles emitted by a chaparral fire in California.

Akagi, S.K.; Craven, J.S.; Urbanski, S.P.; Wold, C.E.; [and others]. 2012. Atmospheric Chemistry and Physics. 12: 1397-1421. Online: <http://www.treesearch.fs.fed.us/pubs/40140>.

Habitat use of the Rio Grande silvery minnow (*Hybognathus amarus*) during a long-term flood pulse in the Middle Rio Grande, New Mexico.

Magana, Hugo A. 2012. Environmental Biology of Fishes. doi: 10.1007/s10641-012-9977-5.

High-resolution interpolation of climate scenarios for Canada derived from general circulation model simulations.

Price, D.T.; McKenney, D.W.; Joyce, L.A.; Siltanen, R.M.; Papadopol, P.; Lawrence, K. 2011. Information Report NOR-X-421. Edmonton, AB: Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre. 104 p.

Linking climate, gross primary productivity, and site index across forests of the western United States.

Weiskittel, Aaron R.; Crookston, Nicholas L.; Radtke, Philip J. 2011.

Maximum outer-bank velocity reduction for vane-dike fields installed in channel bends.

Scurlock, S. Michael; Cox, Amanda L.; Thornton, Christopher I.; Baird, Drew C. 2011. Paper presented at the AGU Hydrology Days; 21-23 March 2011; Fort Collins, CO. 12 p. Online: <http://www.treesearch.fs.fed.us/pubs/39875>.

Methodology for calculating shear stress in a meandering channel.

Kyung-Seop, Sin. 2010. Fort Collins: Colorado State University. 161 p. Thesis. Online: <http://www.treesearch.fs.fed.us/pubs/39877>.

Methodology for predicting maximum velocity and shear stress in a sinuous channel with bendway weirs using 1-D HEC-RAS modeling results.

Scalfani, Paul. 2010. Fort Collins: Colorado State University. 366 p. Thesis. Online: <http://www.treesearch.fs.fed.us/pubs/39876>.

Nationwide assessment of nonpoint source threats to water quality.

Brown, Thomas C.; Froemke, Pamela. 2012. BioScience. 62(2): 136-146. Online: <http://www.treesearch.fs.fed.us/pubs/40204>.

North American vegetation model for land-use planning in a changing climate: A solution to large classification problems.

Rehfeldt, Gerald E.; Crookston, Nicholas L.; Sáenz-Romero, Cuauhtémoc; Campbell, Elizabeth M. 2012. Ecological Applications. 22(1): 119-141.

Quantification of shear stress in a meandering native topographic channel using a physical hydraulic model.

Ursic, Michael E. 2011. Fort Collins: Colorado State University. 154 p. Thesis. Online: <http://www.treesearch.fs.fed.us/pubs/39874>.

Rates of gully erosion along Pikes Peak Highway, Colorado, USA.

Katz, Harry A.; Daniels, J. Michael; Ryan, Sandra E. 2011. Landform Analysis. 17: 75-80.

Reflections on the surface energy imbalance problem.

Leuninga, Ray; van Gorsela, Eva; Massman, William J.; Isaac, Peter R. 2012. Agricultural and Forest Meteorology. 156: 65-74. Online: <http://www.treesearch.fs.fed.us/pubs/40073>.

Soil erosion model predictions using parent material/soil texture-based parameters compared to using site-specific parameters.

Foltz, Randy; Elliot, W. J.; Wagenbrenner, N. S. 2011. Transactions of the ASABE. 54(4): 10 p. Online: <http://www.treesearch.fs.fed.us/pubs/39189>.

Fire, fuel, and smoke

Critical mass flux for flaming ignition of wood as a function of external radiant heat flux and moisture content. McAllister, S.; Finney, M.; Cohen, J. 2011. In: 7th US National Technical Meeting of the Combustion Institute; 20-23 March 2011; Atlanta, GA. Red Hook, NY: Curran Associates, Inc. 1: 1698-1704. Online: <http://www.treeseearch.fs.fed.us/pubs/40073>.

Historic and future extent of wildfires in the Southern Rockies Ecoregion, USA. Litschert, Sandra E.; Brown, Thomas C.; Theobald, David M. 2012. *Forest Ecology and Management*. 269: 124-133. Online: <http://www.treeseearch.fs.fed.us/pubs/40203>.

Mixed-severity fire regimes in dry forests of southern interior British Columbia, Canada. Heyerdahl, Emily K.; Lertzman, Ken; Wong, Carmen M. 2012. *Canadian Journal of Forest Research*. 42: 88-98. Online: <http://www.treeseearch.fs.fed.us/pubs/40159>.

Modeling topographic influences on fuel moisture and fire danger in complex terrain to improve wildland fire management decision support. Holden, Zachary A.; Jolly, W. Matt. 2011. *Forest Ecology and Management*. 262: 2133-2141. Online: <http://www.treeseearch.fs.fed.us/pubs/40156>.

Modeling tree-level fuel connectivity to evaluate the effectiveness of thinning treatments for reducing crown fire potential. Contreras, Marco A.; Parsons, Russell A.; Chung, Woodam. 2012. *Forest Ecology and Management*. 264: 134-149. Online: <http://www.treeseearch.fs.fed.us/pubs/40160>.

Modified technique for processing multiangle lidar data measured in clear and moderately polluted atmospheres. Kovalev, Vladimir; Wold, Cyle; Petkov, Alexander; Hao, Wei Min. 2011. *Applied Optics*. 50(24): 1-10. Online: <http://www.treeseearch.fs.fed.us/pubs/40147>.

Recent trends in post-wildfire seeding in western US forests: Costs and seed mixes. Peppin, Donna L.; Fule, Peter Z.; Sieg, Carolyn Hull; Beyers, Jan L.; Hunter, Molly E.; Robichaud, Pete. 2011. *International Journal of Wildland Fire*. 20(5): 702-708. Online: <http://www.treeseearch.fs.fed.us/pubs/38534>.

Repeated prescribed fires alter gap-phase regeneration in mixed-oak forests. Hutchinson, Todd F.; Long, Robert P.; Rebbeck, Joanne; Sutherland, Elaine Kennedy; Yaussy, Daniel A. 2012. *Canadian Journal of Forest Research*. 42: 303-314. Online: <http://www.treeseearch.fs.fed.us/pubs/40071>.

A review of fire interactions and mass fires. Finney, Mark A.; McAllister, Sara S. 2011. *Journal of Combustion*. 2011: Article ID 548328. Online: <http://www.treeseearch.fs.fed.us/pubs/40149>.

Short- and long-term effects on fuels, forest structure, and wildfire potential from prescribed fire and resource benefit fire in southwestern forests, USA. Hunter, Molly E.; Iniguez, Jose M.; Lentile, Leigh B. 2011. *Fire Ecology*. 7(3): 108-121.

Valuing mortality impacts of smoke exposure from major southern California wildfires. Kochi, Ikuho; Champ, Patricia A.; Loomis, John B.; Donovan, Geoffrey H. 2012. *Journal of Forest Economics*. 18: 61-75.

The wildland fire emission inventory: Western United States emission estimates and an evaluation of uncertainty. Urbanski, S.P.; Hao, W.M.; Nordgren, B. 2011. *Atmospheric Chemistry and Physics*. 11: 12973-13000. Online: <http://www.treeseearch.fs.fed.us/pubs/40152>.

Forest and woodland ecosystems

Ancient barkpeeled trees in the Bitterroot Mountains, Montana: Legacies of native land use and implications for their protection. Josefsson, Torbjörn; Sutherland, Elaine Kennedy; Arno, Stephen F.; Östlund, Lars. *Natural Areas Journal*. 32(1): 54-64.

Approaches to predicting current and future distributions of *Puccinia psidii* in South America under climate change scenarios. Klopfenstein, N.B.; Hanna, J.W.; Graca, R.N.; Ross-Davis, A.L.; Cannon, P.G.; Alfenas, A.C.; Kim, M.-S. 2011. In: Goncalves, Jose Leonardo de Moraes, ed. *Proceedings: IUFRO Conference on Improvement and Culture of Eucalypts; IUFRO Working Group 2.08.03; Porto Seguro, Bahia, Brazil; 14-18 November, 2001. Piracicaba, Brazil: Escola Superior de Agricultura "Luiz de Queiroz": 450-454. Online: <http://www.treeseearch.fs.fed.us/pubs/40074>.*

Approaches to predicting potential impacts of climate change on forest disease: An example with *Armillaria* root disease. Klopfenstein, Ned B.; Kim, Mee-Sook; Hanna, John W.; Richardson, Bryce A.; Lundquist, John E. 2011. In: Chavarrigga, D. M., H., ed. *Proteccion Fitosanitaria Forestal. Colombia: Instituto Colombiano Agropecuario ICA, Comunicaciones: 101-117. Online: <http://www.treeseearch.fs.fed.us/pubs/40075>.*

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Scientists conduct research that spans an area containing 52% of the nation's National Forest System lands (54 National Forests and Grasslands). In the lower 48 states, our territory also includes 55% of the nation's BLM lands, 48% of the designated wildernesses, 37% of National Park Service lands, numerous other public and tribal lands, and 41% of the non-urban/rural private lands.

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Air quality, water availability, water quality, and aquatic habitats are critical issues within the rapidly changing Western United States. The Air, Water and Aquatic Environments program is committed to the development of knowledge and science applications related to air and water quality, as well as the habitat quality, distribution, diversity, and persistence of fish and other aquatic species. Website: http://www.fs.fed.us/rm/boise/awae_home.shtml. Contact Frank McCormick, Program Manager, for more information: 208-373-4351.

Fire, Fuel and Smoke

The Fire, Fuel and Smoke program works to improve the safety and effectiveness of fire management through the creation and dissemination of basic fire science knowledge. The program investigates the impacts of fires on the environment by means of fundamental and applied research for understanding and predicting fire behavior, its effects on ecosystems, and its emissions into the atmosphere. Website: <http://www.firelab.org>. Contact Colin Hardy, Program Manager, for more information: 406-329-4978.

Forest and Woodland Ecosystems

Forests and woodlands are increasingly being impacted by large scale urbanization and human developments, uncharacteristically large and severe wildfires, insect and disease outbreaks, exotic species invasions, and drought, and interactions of multiple stressors at local, landscape, and regional scales. The Forest and Woodland Ecosystems program acquires, develops, and delivers the scientific knowledge for sustaining and restoring forests and woodlands landscape health, biodiversity, productivity, and ecosystem processes. Website: <http://www.fs.fed.us/rmrs/research/programs/forest-woodlands-ecosystem/>. Contact Tom Crow, Program Manager, for more information: 970-498-1378.

Grassland, Shrubland and Desert Ecosystems

Disruptions by large-scale clearing for agriculture, water diversions, extensive grazing, changes in the native fauna, the advent of alien weeds, altered fire regimes, and increases in human-caused insect and disease epidemics have contributed to produce areas that are in unsuitable condition. The Grassland, Shrubland and Desert Ecosystems program addresses the biology, use, management, and restoration of these grass and shrublands. Website: <http://www.fs.fed.us/rmrs/research/programs/grassland-shrubland-desert/>. Contact Debbie Finch, Program Manager, for more information: 505-724-3671.

Human Dimensions

The Human Dimensions program provides social and economic science based innovation to human societies as they develop a sustainable relationship with their environment. Major issues confronting societies across the globe such as global climate change, energy, fire, water, and ecosystem services all have important social-economic dimensions that will be explored and addressed by this program. Website: <http://www.fs.fed.us/rmrs/research/programs/social-economics-decision/>. Contact Cindy Swanson, Program Manager for more information: 406-329-3388.

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The Inventory, Monitoring and Analysis program provides the resource data, analysis, and tools needed to effectively identify current status and trends, management options and impacts, and threats and impacts of fire, insects, disease, and other natural processes. Website: <http://www.fs.fed.us/rm/ogden/>. Contact Michael Wilson for more information: 801-625-5407.

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The Science Application and Integration program is a knowledge transfer unit that provides leadership for the integration and use of scientific information in natural resource planning and management across the Interior West.

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The Wildlife and Terrestrial Ecosystems program is engaged in sustaining species and ecosystems of concern through studies of ecological interactions within and between plant, aquatic, and terrestrial animal communities; understanding public use effects through studies elucidating social and economic values associated with consumptive and non-consumptive uses of fish and wildlife; managing terrestrial and aquatic habitats; and evaluating outcomes of land and water uses and natural disturbances. Website: <http://www.rmrs.nau.edu/wildlife/>. Contact William Block, Program Manager, for more information: 928-556-2161.

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