



LANDFIRE: New Tools for Fire Managers

Over ninety years of fire exclusion, domestic livestock grazing, logging and widespread exotic species invasions have altered fire regimes, fuel loadings and vegetation composition and structure throughout much of the western United States. As a result, the number, size and intensity of wildfires have significantly changed from the historical conditions, sometimes with catastrophic consequences.

In response, the President directed the Secretaries of Agriculture and the Interior to develop a report that recommends how best to: respond to severe wildland fires, reduce fire impacts on rural communities, and ensure sufficient firefighting capacity in the future. Congress in turn mandated the implementation of the National Fire Plan in the 2001 Interior and Related Agencies Appropriations Act. The National Fire Plan is a long-term



investment aimed at helping protect communities and natural resources, and most importantly, the lives of fire fighters and the public. It is a long-term commitment based on cooperation and communication among federal agencies, states,

The National Fire Plan advocates a new approach to wildfires by shifting emphasis from reactive to proactive – from attempting to suppress wildland fires to reducing the buildup of hazardous vegetation that fuels severe fires. The Plan recognizes that, unless hazardous fuels are reduced, the number of severe wildland fires and the cost associated with suppressing them will continue to increase.

In order to implement the National Fire Plan, federal land management agencies need accurate, complete and comparable data for prioritizing, planning, monitoring and allocating dollars and resources. Mapping fuels and fire regimes at broad scales generally requires advanced Geographic Information Systems (GIS), remote sensing techniques and complex statistical analyses. The difficulty of creating these maps is compounded by complex spatial and temporal dynamics of wildland fire. Extensive knowledge and experience in fire ecology, geographic information system techniques, remote sensing and image processing is needed to create the maps required by the National

The LANDFIRE Project

Enter a new multi-agency, inter-disciplinary research and development project called LANDFIRE. This project is geared to provide maps and computer models needed by land and fire managers to prioritize, evaluate, plan, complete and monitor fuel treatment and restoration projects essential to achieving the goals targeted in the National Fire Plan and the Healthy Forests Restoration Act of 2003.

LANDFIRE is a joint project between the U.S. Forest Service, U.S. Geological Survey, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and the U.S. Fish and Wildlife Service, with principle investigators located at the Forest Service's Rocky Mountain Research Station - Fire Sciences Laboratory in Missoula, MT, and

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LANDFIRE is creating maps that characterize vegetation, historical natural fire regimes, and departures of historical natural fire regimes, known as fire regime condition classes. These maps will be used to prioritize areas for hazardous fuel reductions projects while evaluating rehabilitation and restoration objectives. They can also be used to reduce wildfire costs, losses and damages by prioritizing communities within the vicinity of federal lands that are at high risk from wildland fires.

LANDFIRE is also creating a series of maps that characterize fuel conditions based on fire behavior, fire effects and fire danger research, and is developing a series of succession models that will be used to evaluate ecosystem status and fire hazard and potential status.

LANDFIRE Products

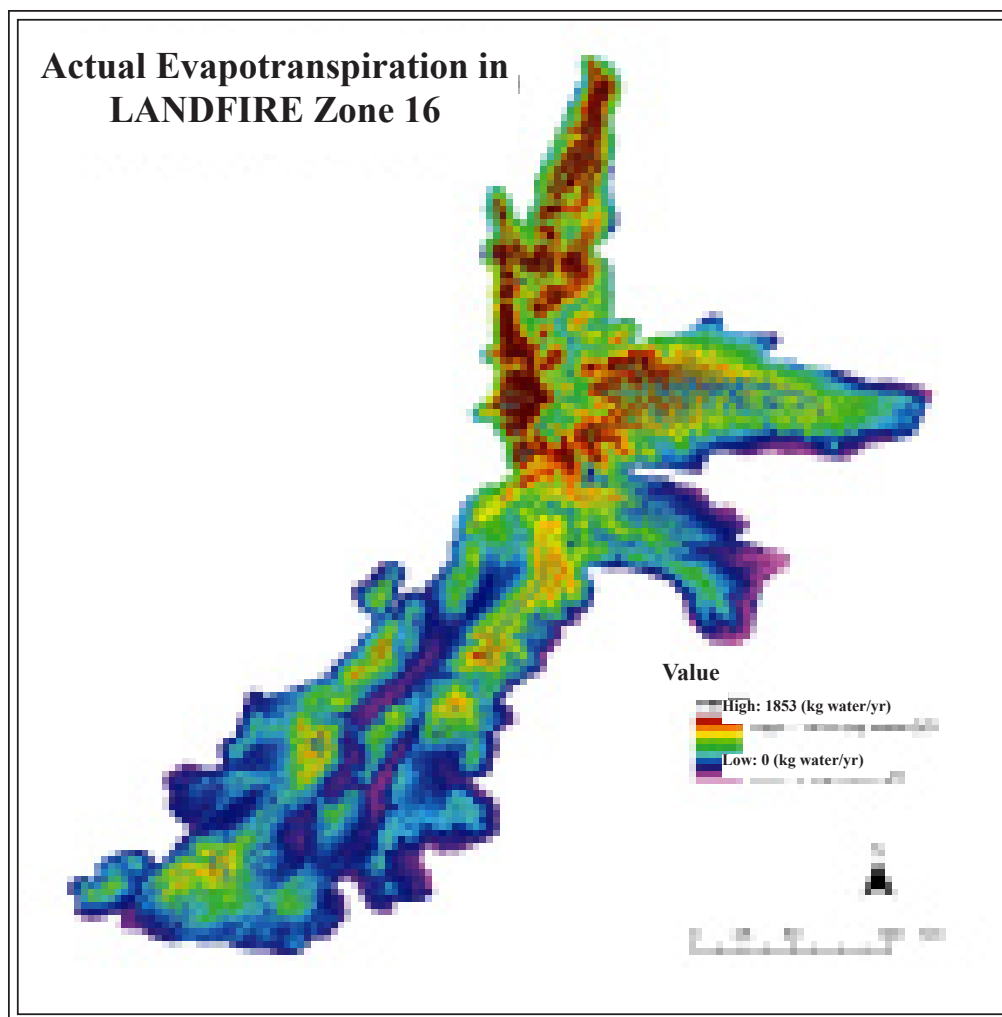
These tools are currently being developed and tested in two large prototype areas in the western U.S. – the highlands of central Utah, and the Northern Rocky Mountains in western Montana and Idaho. This work began in 2002 and will end

in 2005. The fuel and fire regime maps for the central Utah prototype, along with biophysical settings and potential vegetation type maps for the Northern Rockies area are nearly complete. Initial fire behavior and effects, and fire danger products will be available for central Utah by summer 2004. A comprehensive package of on-

2003 Fires Provide Test

Several LANDFIRE concepts and procedures were put to the test when lightning ignited hundreds of fires in Montana and Northern Idaho

during the summer of 2003. The Multi-agency Area Command requested that the Fire Sciences Laboratory provide them with technical support for locating fires and conducting a long-range assessment of potential fire behavior and effects given best, worst and most-likely case scenarios. Station scientists used data from their Moderate Resolution Imaging Spectroradiometer satellite receiving station to locate fires, often through dense smoke that precluded visual detection. Airborne infrared sensors located and mapped fire perimeters, and because the staff, infrastructure and many of the databases were in place, the



This map, one of many tools created by LANDFIRE, helps resource specialists predict fuels and vegetation.

Landfire team was able to provide fuels and terrain data. The team also mapped communities and infrastructure at risk. The fuels, weather, predicted fire spread and values at risk data were integrated into map products that helped area commanders develop emergency management plans and allocate suppression resources, thereby improving overall safety and effectiveness. The fires were invaluable for demonstrating concepts, refining procedures and building partnerships with fire managers, and they reinforced the need for a robust fuels treatment program and illustrated how real threats can be

LANDFIRE is getting recognized around the country as a valuable state-of-the-art tool for resource managers. In a recent General Accounting Office report (GAO 2002), the GAO describes LANDFIRE as “the only proposed research project so far that appears capable of producing consistent national inventory data for improving the prioritization of fuel projects and communities.”

While LANDFIRE produces nationally consistent and comprehensive fire and fuels maps across the conterminous U.S. at spatial scales fine enough for local fire and land management planning, its products are not intended to replace existing data and maps used by land management agencies. Instead, LANDFIRE should complement local efforts and provide a “safety net” for wildland fire managers that lack high quality spatial data for specific areas.

Find out more about LANDFIRE by visiting <http://www.landfire.gov>.



Treating fuels to reduce the potential for crown fires and restore white bark pine ecosystems on the Clearwater National Forest in Idaho.

Publication Reviews

Reestablishing Natural Succession on Acidic Mine Spoils at High Elevations

Methods for restoring native plant communities on acidic mine spoils at high elevations were evaluated in a “demonstration area” in the New World Mining District of southern Montana. Research plots installed in 1976 were assessed for 22 years and compared with adjacent native reference plant communities. A 1.5-acre area of mine spoils was shaped and treated with hydrated lime, organic matter, and fertilizer. The area was then seeded heavily with five native grasses collected from adjacent native plant communities. Natural seed rain, transplanting, refertilization, and use of introduced species were also studied. Research Paper RMRS-RP-41 is available online at http://www.fs.fed.us/rm/pubs/rmrs_rp041.html.

Economic, Social and Cultural Aspects of Livestock Ranching on the Espanola and Canjilon Ranger Districts of the Santa Fe and Carson National Forests: A Pilot Study **(RMRS-GTR-113)**

The ranches of northern New Mexico, composed of land and livestock, are integral components of family and community life. This pilot study examines current economic, social, and cultural aspects of livestock operations owned by ranchers with federal grazing permits (permittees) on the Canjilon and Espanola Ranger Districts of the Santa Fe and Carson National Forests. The research develops preliminary results and tests survey methods that will be used in a planned larger study. Information gathered is intended to help agency managers administer forest lands with increased effectiveness by promoting greater cultural understanding. General Technical Report RMRS-GTR-113 is available online at http://www.fs.fed.us/rm/pubs/rmrs_gtr113.html.

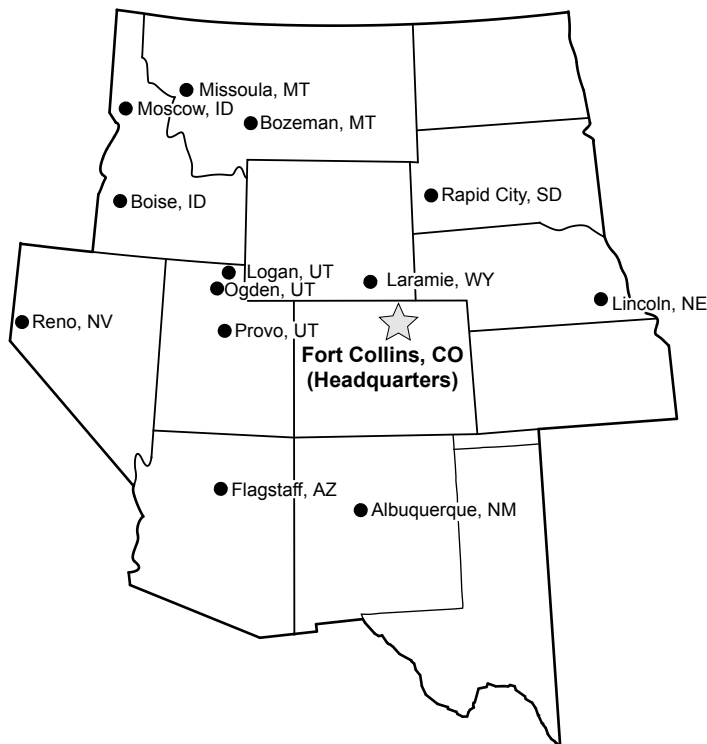
*RMRS*Science is a quarterly report from the USDA Forest Service’s Rocky Mountain Research Station. Each issue highlights on-going or recently completed research, and features findings useful to land managers and other natural resource specialists. To be added to the mailing list, free-of-charge, write *RMRS*Science, Rocky Mountain Research Station, 2150 Centre Ave., Bldg. A, Fort Collins, CO 80526; or e-mail rfletcher@fs.fed.us; or fax (970) 295-5927. Comments and suggestions are always welcome.

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