

## Central Region Fire Science Priority

### Issues/Problems

Science-based information on fire suppression, fire management, rehabilitation, and restoration of natural resources is critically needed by Federal, State, and local agencies to manage fire and mitigate impacts on people, their property, and natural resources. The USGS can be uniquely poised to respond to this need by supporting a comprehensive, integrated and scientifically relevant Fire Science Program. The scientific information and technical assistance needs of fire managers and natural resource managers of Department bureaus and other land managers is increasingly evident. For example, the recent devastating fires in southern California indicate the continued and growing need for both short- and long-term solutions to fire issues based on sound science. The fundamental core of USGS involvement in fire science relies on solid scientific understanding of fire effects across a full range of biophysical settings and ecosystems. The USGS has expertise in both applications and research over a broad array of disciplines linked to fire, including fire ecology, vegetation and animal ecology, geology, hydrology, geography and sociology. Expertise within the USGS can address not only the immediate support needs of the wildland fire community, but also longer-term research needs regarding ecological impacts and roles of wildland fire. USGS scientists can also contribute to fire risk identification activities, support for fire planning, fuels treatment and fire suppression activities, and perform post-fire hazard, impact, and human-effects assessments. USGS fire science and fire science related expertise is recognized by other Federal agencies. In addition to the DOI bureaus, strong relationships are being established with the Forest Service, Forest Service Research, and the academic community to help build the national capacity that is much needed to address fire management and natural resource management issues on state and private lands as well as federal lands. The top priority for USGS, therefore, is to establish appropriate funding and coordination that forms the basis of a responsive and relevant USGS Fire Science Program. Such support will advance the understanding of fire and result in the significant improvements for fire management called for across agencies by the National Fire Plan.

### Stakeholders

In addition to assembling a complete list of stakeholders (which will be extensive) we need to find ways to get input from our stakeholders on the information they need from us, as well as what has been effective in the past. We will ask the tough questions about when they have been frustrated with USGS and how we could be more responsive to their needs. We suggest two ways to do this: First, have a USGS employee spend considerable time at NIFC to learn about needs and determine the best way to plug into the extensive wildfire communication network. The USGS liaison to NIFC would be responsible for disseminating these needs back to the USGS fire science community. USGS needs better ways to seek input and get information on specific needs. Second, hold periodic stakeholder meetings to jointly discuss the needs, ways to best serve the

stakeholders, and the best courses of action to be taken by the science and data-collection community.

### Opportunities for Integration

Integration within fire science occurs on three critical levels. The first is during the process of needs assessment and understanding the requirements of fire managers across agencies. This is a dynamic interface between researchers, fire operations personnel, and other managers who must respond to fire, and it steers USGS activities in particular directions. USGS scientists must integrate within disciplines as well as with other agencies. Second, integration that occurs across all disciplines of fire research is key to development of dependable models for fire forecasting and prediction of near-to-long-term effects. This is primarily between principle investigators in the areas of research objectives, study design, and data compatibility. Thirdly, integration is required for implementation of activities that directly support fire operations and management. This involves personnel, infrastructure and production capabilities within the USGS, as well as working relationships across agencies.

### USGS Program Goals

- Develop a better understanding of fire's ecological role over the full range of biophysical settings and ecosystems. Fire is an integral part of nature. Basic fire ecology identifies biological sensitivities and dependencies, guiding management in prediction of post-fire consequences, and in engineering the proper application of fire for long-term management. This understanding extends to physical processes within burned watersheds that affect runoff, erosion, and sedimentation, debris-flow generation and water quality issues. Programs and Disciplines: BRD, NRP, LHP, WRD
- Develop means for securing better and more timely empirical data on fire effects and responses. This includes the development of new methodologies, technologies, or approaches for quantifying and mapping active fires and post-fire effects, as well as field sampling designed appropriately for common use and integration across disciplinary perspectives. Such means are critical for accountability of fire-management programs as required by the National Fire Plan. Programs and Disciplines: BRD, NMD, WRD, GD, NRP, LHP
- Develop critical scientific understanding of the factors that influence fire, such as climate, weather and fuel, and how those affect fire regimes. From the perspective of land managers, there is a need to facilitate definition and monitoring of fire regime conditions class, and coupled with fire history research, to quantify departures from desired conditions. As recent fire influence conditions classes, there is need for improved content and availability of regional fire atlases. Programs and Disciplines: BRD, NMD, WRD, GD, NRP,
- Develop methods to integrate the preceding topics in addressing fire-related socio-economic issues and specific requirements of short-term management. The goal is to provide better information and means toward reliable suppression strategies, post-fire mitigation and rehabilitation, and risk reduction to the public and human investments. Such efforts focus on emergency response, treatments and prescriptions, priority setting, fuel reduction, risk assessment, safety, public

information, and cost effectiveness. Programs and Disciplines: BRD, NMD, WRD, GD, NRP, LHP

## Strategy

Fire science relates to the USGS Mission to “serve the Nation by providing reliable scientific information to: describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life”. It is a program long term goal to “Ensure the continued transfer of data, risk assessments, and disaster scenarios needed by our customers before, during, and after natural disasters, and increase the delivery of real-time hazard information to minimize loss of life and property”.

The USGS is the primary source of mapping information in support of fire management. USGS has also established itself as an increasingly important source of high quality scientific information on fire and fire effects including forest, rangeland and non-forested landscapes. The need for scientific information on fire and fire effects by other Bureau programs and more importantly land management agencies in the Department of Interior (DOI) and the U.S. Forest Service has been the catalyst to making fire a science and fire management support priority within the Central and Western Regions. USGS has been successful in collaborating with Forest Service Research, DOI bureaus, State and local government, and non-governmental organizations to apply its scientific expertise in fire ecology, post-fire impact assessment, burn severity mapping, rehabilitation and restoration, and fire-fuels mapping. These also actively support planning for hazardous fuels reduction under the Healthy Forest Initiative.

Fire is a natural hazard in the same paradigm as earthquakes, volcanoes, and landslides which are Bureau Programs. The USGS and the public will benefit from the addition of a program focused on fire science as it would provide a framework for the internal coordination of existing fire science activities with the USGS and enhance fire science opportunities funded by appropriations from Congress. This program will offer opportunities for USGS scientists to work collaboratively with other fire scientists from private, state, and federal agencies to provide the expertise needed to fill in knowledge gaps that USGS expertise cannot provide. The USGS will also work collaboratively with land managers to provide scientific information useful to make sound management decisions involving ecosystem management. Therefore, it is strongly recommended that the USGS CELT and ELT develop a plan to establish a Bureau-level Fire Science program. This is highlighted as our first strategic action for the CELT in the table below:

Problem	Action	Benefits
<p>USGS has many science projects and efforts related to Wildland Fire issues. Wildland fire is a national level priority that warrants its own program.</p> <p>USGS would benefit immediately from increased coordination of fire science activities.</p> <p>USGS would benefit from increased opportunities to coordinate with existing private, state and federal organizations.</p> <p>While the USGS has many web links to their Fire Science activity there is no one place for scientists, stakeholders, or the public to get information.</p> <p>The Public, Stakeholders and members of the disciplines are not fully informed or aware of all that is going on in USGS concerning wildland fires.</p> <p>Stakeholders are not aware of USGS capabilities. The USGS would benefit from conducting a needs assessment and having a better understanding of the requirements of the wildland fire managers.</p>	<p>Establish, fund, and staff, a Bureau-level Fire Science Program. The Fire Science program will serve to coordinate the fire science activities throughout the Central Region.</p> <p>Restructure the Fire Science Coordination Team to be composed of the current Bureau coordinator, Stan Coloff, and three Regional Science Coordinators. This team will develop a plan to establish a USGS Fire Science Program. The Fire Science Coordination team will develop a plan to collaborate with existing organizations such as the National Wildland Fire Coordination Group.</p> <p>The Fire Science Coordination Team will develop and maintain a USGS fire Science Web Site, which will represent all USGS disciplines and regions.</p> <p>The Fire Science Coordination Team will create and maintain a USGS Fire Science Fact Sheet. This Fact Sheet will represent current capabilities and research of all four disciplines.</p> <p>The Fire Science Coordination Team will conduct a Wildland Fire Science Stakeholders Workshop in conjunction with a National level multi-agency wildland fire conference.</p>	<p>Organizes fire related activities under one program. Reducing duplication and confusion within the Bureau. A program will help legitimize the USGS with fire managers.</p> <p>Organizes fire related activities in anticipation of a Fire Science Program. Provides a plan for the USGS to implement such a Program.</p> <p>Increased collaboration in fire related activities. Provide visibility to USGS fire science activities and avoid any redundancies.</p> <p>Adds an organized, professional face to our Science for the public and stakeholders.</p> <p>This will provide the public, stakeholders, and the disciplines with concise, accessible information. The fact sheet can be a used in combination with the website to promote USGS wildland fire activities.</p> <p>Provides the opportunity for the stakeholders to learn about USGS projects and address their concerns. Provides the opportunity for the USGS to address stakeholders concerns and learn their requirements.</p>

<p>Currently, there is no coordinated process when responding to disasters or emergencies.</p>	<p>The Fire Science Coordination Team will establish 'Post-Fire Rapid Response Teams', as well as a process to respond to disasters and emergencies. These teams would perform emergency hazard assessments, advise emergency managers of potential hazards, and collect critical perishable data that addresses issues of post-fire flood and debris flows, water quality impairment, and biologic effects. (see DRAFT USGS Fire Science Response Plan dated November, 2002 and attached as an appendix)</p>	<p>Teams responding to disasters and emergencies would be more organized and better prepared. Response time would be reduced and the teams would work more effectively.</p>
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