NOTICE OF INTENT
DOA/DOI Joint Fire Science Program (JFSP)
Funding Opportunity Notice (FON): September-November, 2016
Potential Topics
July 14, 2016

Background
The interagency Joint Fire Science Program (JFSP) intends to request proposals through one or more formal Funding Opportunity Notice (FON) announcements beginning approximately September 15, 2016 and remaining open through November 17, 2016. The intent of this notice is to provide an early alert to investigators interested in the topics listed below so that they can begin considering responsive ideas with potential partners and collaborators.

Investigators should recognize that final decisions regarding topic selection will not be made until September 2016 and that final topic selection may differ from that posted here. One or more topics could be dropped or added, and the specific focus of individual topics may be altered. Investigators should recognize this uncertainty and not invest substantial time or resources working on proposals until the FONs and their associated topics are formally posted.

Investigators should not contact the JFSP Office or Governing Board members seeking further information on these topics. No further information will be released until the FONs are formally posted.

Note that at least three separate FONs are likely.

Cohesive Strategy
Potential topics directly and indirectly support the three goals of the 2014 *National Cohesive Wildland Fire Management Strategy* ("Cohesive Strategy"):

- Resilient Landscapes
- Fire Adapted Communities
- Safe and Effective Wildfire Response

FON 1 - Primary
A. Landscape fuel treatment as a fire management strategy
Landscape-level fuel treatment must be carefully considered in terms of resource benefit, cost, and effects on firefighter and human community safety. Many current planning processes focus on landscape fuel treatment strategies that are designed to enable firefighters to safely and effectively protect highly valued resources from wildfire, while also providing expanded opportunities for firefighters to utilize prescribed fire and wildfire for resource benefit. The JFSP is interested in proposals that through the use of retrospective analyses, modeling, or other feasible approaches evaluate landscape fuel treatment strategies with a focus on the interactions between landscape fuel treatments and subsequent fire suppression and fire management actions, as these relate to firefighter safety, access, and ability to apply fire in fire-dependent systems. Proposed work also should evaluate how the effectiveness of landscape fuel treatment strategies differ by social, ecological, and treatment

characteristics; however, this topic does not include an evaluation of the direct effect of landscape fuel treatments on resources. For the purposes of this topic, a landscape treatment can include a series of treatments applied across a landscape or a fuel break treatment designed to have a landscape effect.

B. Effects of wildfire as a treatment

Since issuance of the 2009 *Guidance for Implementation of the Federal Wildland Fire Policy* that allows for multiple management strategies to be applied to a wildfire, anecdotal evidence suggests that the strategies and tactics for managing wildfires have changed. The JFSP is interested in proposals that employ a retrospective analysis and evaluate the extent to which wildfire management strategies and tactics have changed, their effectiveness for managing wildfire to reduce risk to highly valued resources, and under what range of conditions (e.g., weather, fuels) they are effective.

C. Post-fire recovery

The consequences of fire on the landscape, especially in the presence of invasive species and a non-stationary climate, present unique challenges for successful post-fire recovery. Long-term recovery, as determined by the sustained return of desired ecosystem services, also may be dependent on the effects of immediate post-fire stabilization methods and the phasing of recovery actions. The JFSP is interested in fundamental and applied research that address the underlying bases for recovery within the context of both soil and vegetation and their interaction, restoration of desired ecosystem services, and interactions between initial post-fire stabilization and long-term recovery actions and their phasing. Proposed research should be based on a scientifically credible conceptual model of ecosystem function in the presence of fire, include developing defensible and easily measured metrics of recovery success, and address mitigation of barriers that may negatively affect recovery. The JFSP is particularly interested in proposals that address post-fire recovery in ecosystems across the range of the greater sage-grouse (*Centrocercus urophasianus*); however, proposals that address post-fire recovery in other ecosystems also are welcomed.

D. Fire effects on herbaceous species, shrubs, and seed banks

Compared to fire effects on soil and trees, few resources are available for predicting the response of herbaceous species, shrubs, and seed banks to fire. The JFSP is interested in proposals that will compile existing data or collect additional data on fire effects on herbaceous species, shrubs, and seed banks for incorporation into new or existing first-order, fire effects prediction models. Demonstration of model validation using the preceding data is desirable, but not required.

E. Validating mesoscale, atmospheric boundary prediction models and tools

Thunderstorm outflows, gust fronts, and downdraft winds potentially threaten firefighter safety due to resultant changes in fire behavior. Improved detection and prediction of these phenomena would be of significant benefit to fire management activities. Numerical weather models, some of which couple fire behavior algorithms, attempt to predict the development, movement, and magnitude of the mesoscale atmospheric boundaries that produce these winds. The operational fire weather community requires validation of these models as a means to enhance firefighter safety by raising situational awareness within a risk management context. The JFSP is interested in proposals that address validation requirements of existing models and tools to demonstrate their operational predictive capabilities in regards to mesoscale atmospheric boundaries and their associated winds, especially in complex terrain. Specific model development proposals are outside the scope of this topic; however, improvements in model structure that occur incidental to model validation are acceptable.

Thunderstorm outflows, gust fronts, and downdrafts potentially threaten firefighter safety due to resultant rapid changes in fire behavior. Improved capability to detect and predict these phenomena would be of significant benefit to fire management activities. Numerical weather models, some of which are coupled to fire behavior models, attempt to predict the development, magnitude, and movement of mesocale atmosphere boundaries and the resultant timing, direction, and magnitude of associated winds. These models require validation in operational environments to improve prediction and thus enhance firefighter safety by raising situational awareness. The JFSP is interested in proposals that address validation requirements of existing models and tools to demonstrate their operational prediction capabilities, especially in complex terrain. Potential effects on fire behavior should be conveyed within a risk management context. Specific model development proposals are outside the scope of this topic; however, improvements in model structure that occur incidental to model validation are acceptable.

F. Factors that affect the co-management of fire "risk"

Experience and foresight have told us that certain environmental issues—be it ecosystem-based management, climate change, and fire—cannot be addressed in an isolated, inside the fence line approach. Fire in particular does not adhere to an administrative boundary. Fire also has both benefits and adverse consequences that may be viewed differently by various interested and affected parties. The potential for adverse consequences poses a "risk" that must be balanced against the potential benefits of a particular fire. In its classic form risk is a combination of probability and consequence, though under climate change probabilities may not easily be assigned to changes in fire risk and scenario-based approaches may be needed to bound risk. To effectively co-manage fire risk, including in the context of an uncertain future, many social factors come in to play that will dictate success or failure. The JFSP is interested in fundamental and applied research that address the human dimensions of fire risk co-management, including the factors that lead to successful co-management across administrative and ownership boundaries and whether they are universal or differ by ecosystem, region, or culture. In addition, the role of co-production of knowledge and how the distribution of costs and benefits affects outcomes are of interest.

FON 2 - Graduate Research Innovation (GRIN) award

In partnership with the Association for Fire Ecology, the Joint Fire Science Program (JFSP) will likely continue the Graduate Research Innovation (GRIN) program for current master and doctoral students in the fields of wildland fire and related human dimensions, ecological, and atmospheric sciences. The purpose of these awards is to enhance student exposure to the management and policy relevance of their research. As a result, these awards will enable graduate students to conduct research that will supplement and enhance the quality, scope, or applicability of their thesis or dissertation to develop information and products useful to managers and decision-makers.

Proposals must describe new, unfunded work that extends ongoing or planned research that is the subject of a thesis or dissertation that has been approved by the graduate student's advisory committee. Proposals must be directly related to the mission and goals of JFSP to be considered, and they must address management- or policy-related questions related to one or more of the following topic areas: fire behavior, fire effects, fuel treatments, post-fire recovery, smoke or emissions, risk management, or social issues and fire.

Note: the specific topics eligible for GRIN proposals identified in the FON may differ from those listed above.

FON 3 - Fire and Smoke Model Evaluation Experiment (FASMEE)

The Joint Fire Science Program (JFSP), in partnership with the Department of Defense, Environmental Security Technology Certification Program (ESTCP), previously initiated planning for the Fire and Smoke Model Evaluation Experiment (FASMEE; Phase 1). It is anticipated that the JFSP fall 2016 FON will include an open solicitation for proposals to participate in Phase 2—data collection, data archival, and initial model evaluation—of FASMEE. In brief, this experiment is being designed as a large-scale field campaign to:

- develop and apply relevant measurement/data collection techniques at different spatial and temporal scales;
- provide resultant critical observational data necessary to evaluate and advance operationally used and next generation fire and smoke modeling systems; and
- provide data to support the underlying scientific basis for fire and smoke models.

The FASMEE field campaigns are anticipated to be conducted as large operational prescribed fires targeting heavier fuel loads and high intensity fire in forested sites in the western United States (U.S.) and lesser fuel loads and lower intensity fires in the southeastern U.S. Candidate sites include the Fishlake National Forest in Utah, North Kaibab Ranger District and Grand Canyon National Park in Arizona, Fort Stewart in Georgia, and Savannah River Site in South Carolina. Research burns are planned for ignition no earlier than late 2018 and no later than early 2021. Depending on total funding availability, four or more burns are planned. To leverage resource and scientific opportunities, the JFSP is pursuing a collaborative multi-agency approach to execute FASMEE that includes an inter-agency FASMEE Coordination Committee. Additional background information about FASMEE can be found at http://FASMEE.net.

The FASMEE FON will include multiple task statements organized by research disciplines, potentially including:

- fuel and fuel consumption
- fire behavior and energy
- plume dynamics and meteorology
- smoke emissions, chemistry, and transport.

Final task statement determination will not occur until the FON is posted.

For each task statement, proposers should anticipate including the following components:

- specific research questions, model validation, and model operational applications or development needs to be addressed;
- proposed data collection, including rationale, specific methods, and relevant spatial and temporal scales, and how resultant data will be used to address the preceding questions, validation, application, and development needs
- data management, reduction, and archival plans, as applicable
- cost estimates to support one or more burns by region.
- assistance with finalization of the FASMEE study plan by the fall of 2017.

Along with final task statements, specific requirements associated with data collection will be detailed in a draft measurement specifications document that is currently in preparation. No-cost, low-cost, or cost-shared proposals from researchers supported by partner organizations will be encouraged. Funding decisions for implementation of Phase 2 will be made based on viable candidate proposals by task statement and a draft FASMEE study plan in the early spring of 2017.