



2011-13 Fire Research Needs for Alaska

Alaska Wildland Fire Coordinating Group - Fire Research Development & Application Committee

Alaska’s fire and land managers need science-based information in order to make ecologically sound and effective decisions about fire management activities, including fire suppression.

The purpose of this prioritized list is to encourage fire research and funding for proposals that address management needs in Alaska and stimulate communication among researchers and fire managers.

Category	General Topic
Fire Behavior Models	Fire Behavior Models: Validation and
Fire Danger	CCFDRS Fire Weather Indices: Evaluation & Calibration
Climate Change	Climate Impacts on Fire Regimes: Past, Present & Future
Fuels Treatment	Fuels Treatments: Short- & Long-term Effectiveness
Fire Effects	Post-Fire Vegetation Succession Pathways
Fire Effects	Invasive Plant Species
Weather	Fire Weather Forecasting
Climate Change	Climate Change Effects on Fire Effects
Fire Effects	Burn Severity: Detection & Trends
Fire Effects	Hydrology, Wetlands & Permafrost Features
Fire Effects	Human Subsistence Lifestyles
Fuels Treatment	Utilization of Fuels Treatment Byproducts
Tactics	Fire-line Rehabilitation Effectiveness
Weather	Fire Season Weather Forecasts
Tactics	Current Fire Management Option Application Effectiveness
Socio, Education & Information	Fire Outreach & Public Awareness Effectiveness
Fire Effects	Fish Habitat & Populations
Smoke & Carbon Emissions	Smoke Models & Human Impacts
Tactics	Fire Suppression Method Effectiveness
Fire Effects	Bird Habitat & Populations
Fire Effects	Ungulate Habitat & Populations
Smoke & Carbon Emissions	Carbon Sequestration
Fire Effects	Furbearer & Small Mammal Habitat & Populations
Fuels	Decomposition Rates of Woody Debris
Fire Effects	Wild Berry Productivity & Availability

Why is a fire research needs list needed in Alaska?

Fire is the most prevalent natural disturbance in Alaska, affecting forest and tundra ecosystems as well as human interests throughout much of the state. Many communities are effectively isolated islands surrounded by vast expanses of undeveloped, and often fire-prone, habitats.

The Fire Research Development & Application Committee (FRDAC), sponsored by the Alaska Wildland Fire Coordinating Group (AWFCG), is tasked to identify and prioritize fire research needs that directly address fire and land management questions in Alaska. This inter-agency group also promotes awareness of these research questions and encourages interested scientists to pursue related projects.



Top 5 Fire Research Needs

1) Fire Behavior Models: Validation and Application

More information on fuel models (Scott and Burgan 40 and Canadian Forest Fire Behavior Prediction System) is needed both spatially and as they relate to fire behavior modeling. Ecosystems of particular interest are: wetlands, shrublands, and tundra as well as forests with insect and disease damage. Additional information is also needed about appropriate fuel models for early successional fuel types and accuracy of LANDFIRE vegetation and fuels classifications.



2) Canadian Forest Fire Danger Rating System (CFFDRS) Fire Weather Indices: Evaluation and Calibration

There is a strong need for calibration of the CFFDRS indices in order to accurately represent: 1) Alaska boreal fuel types and 2) seasonal changes in duff moisture. A mechanism for standardizing spring start-up values is also needed so that CFFDRS indices reflect over-winter drought conditions, snowmelt dates, soil thaw, and early-season fire danger.

3) Climate Impacts on Fire Regimes: Past, Present, and Future

Policy makers, as well as fire and land managers, seek research to elucidate: 1) climate linkages to past and present natural fire regimes and 2) current and future departures from historical conditions. A concerted effort is needed to document fire regimes across all vegetation types in Alaska and model how future fire regimes may shift in response to a changing climate. These scenarios will be used to inform managers of potential changes in fire intervals, fire extent, seasonality, and burn severity and allow for a planned response to predicted changes in fire activity.



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4) Fuels Treatments: Short- and Long-term Effectiveness

Evaluation of the effectiveness of fuels treatments in reducing fire risk and smoke emissions over time is needed to inform decisions on treatment implementation and maintenance. Monitoring of fuel breaks should continue beyond initial installment to track: 1) vegetation recovery and fuel loading and 2) seasonal variations in fire risk. A better understanding of post-treatment vegetative succession is required to avoid promotion of undesirable species, insect infestations, and highly flammable surface fuels.



5) Post-Fire Vegetation Succession Pathways

Information is needed on post-fire successional pathways for tundra (tussock, shrub, bryophyte, and lichen dominated), shrub thickets, tree-line forests, and other fuel types. Managers are also interested in: 1) Interactions among fire, permafrost degradation, and plant succession; 2) influence of climate change on successional pathways; and 3) effects of shortened fire return intervals on fuels and vegetation regeneration, particularly in recently burned early-successional areas which are not acting as predictable fuel breaks.



Alaska Research Needs—A Collaborative Effort

A comprehensive list of fire research topics was generated by AWFCG members and other land and fire managers during the 2010 Annual Fall Fire Review and Alaska Fire Science Workshop.

The list was then compiled by Research Committee Members and distributed to a broad range of Alaska fire, biological, and land management staff for review. The topics were ranked based on relevance to fire management needs, resulting in a prioritized list of 25 fire research topics within 9 categories (see *List of Prioritized Fire Research Topics on front*).

Short descriptions of the top 5 ranked AWFCG Research Needs Topics are provided here. The expanded list of fire research topics includes descriptions and associated research questions for each topic and may be accessed at:

<http://www.frames.gov/afsc/researchneeds>

The Research Committee would like to hear from people interested in pursuing research that address the AWFCG research needs. Please contact us for more information!



AWFCG—Fire Research Development & Application Committee (FRDAC)

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<http://www.frames.gov/afsc/frdac>

<http://fire.ak.blm.gov/administration/awfcg.php>