Title:
Rapid Response Research: Lessons from Assessing Burn Severity On Active Wildfires

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Abstract:
The USDA/USDOI Joint Fire Sciences Program has funded the Rapid Response project "Assessing the Causes, Consequences and Spatial Variability of Burn Severity" to be conducted during and after active wildfire incidents. This poster will highlight our sampling efforts on nine large wildfires and provide insight for future rapid response efforts. Our team quantifies conditions before, during and after fires burn. We work closely with and share data and results with Fire Use, Incident Management, and BAER teams. Our goal is to understand the spatial variability in fire effects. We will provide an improved set of quantitative indicators of burn severity that are scalable and mappable from the ground, using satellite and airborne hyperspectral imagery. Our data will be useful to fire managers making challenging, timely decisions and in building the next generation of fire behavior and fire effects models. Much of this research would be impossible if we were not sampling as wildfires burn. Because the study area is not identified until large fires occur, our rapid response project must integrate many of the design limitations of opportunistic landscape-scale research. The challenges of rapid response research are many. Researchers must rapidly evaluate potential study sites, mobilize for data collection, and coordinate with Incident Command systems to ensure safety and address other fire management concerns. We will share the lessons that we have learned from this study and other attempts to integrate "adaptive fire research" on active large wildfires in Montana, Alaska, California, and elsewhere.

Title:
Consequences and Spatial Variability of Burn Severity for Four 2003 Montana Wildfires

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Abstract:
We have characterized fire effects for four large wildfires that burned in western Montana in 2003; all of which historically experienced mixed severity fire regimes. Fire severities ranged from unburned to low, moderate and high severity. Spatial variability was high. Areas burned most severely were relatively uniform, while the spatial heterogeneity of moderate and low severity burns was respectively high and higher. We have evaluated the accuracy of Burned Area Reflectance Classification (BARC) maps produced by the Remote Sensing Applications Center (RSAC) for Burn Area Emergency Response (BAER) teams and tested the utility and accuracy of other burn mapping methodologies. Vegetation indicators are more meaningfully correlated with burn severity than are soil surface cover measurements or soil infiltration rates. We recommend that BAER teams rely on the continuous BARC-Adjustable product (and assign their own severity thresholds as needed) more than the classified BARC product, which oversimplifies highly heterogeneous burn severity characteristics on the ground. Postfire burn severity maps serve as a rapid indicator of the hydrologic response of the burned area by estimating fire effects on soils; however, BAER teams should consider BARC products much more indicative of post-fire vegetation condition than soil condition. We will concentrate future efforts on spectral mixture analysis to estimate green and nonphotosynthetic vegetation, litter and soil fractions directly from postfire hyperspectral imagery acquired over 9 fires, including Simi and Old (California), Black Mountain 2, Cooney Ridge, Robert, Wedge Canyon (all in Montana), Porcupine, Chicken and Wall Street (all in Alaska).