Synopsis

Fire behavior measurements collected during active wildfires are paramount to fire behavior research (Butler et al. 2004). Many existing fire behavior models are based on laboratory data (i.e., Rothermel 1972; Viegas 2004), data collected during experimental burns (Alexander et al. 2004), or a combination of these. With advancements in technology it is possible to gather fire behavior data on actively burning wildland fires (Jimenez et al. 2007) to help calibrate modeling outputs. A USDA Forest Service Enterprise Team, Adaptive Management Services (AMSET), coordinates the FBAT module focused on collection of fire behavior data on active wildland fires in collaboration with land managers and research groups. The FBAT module assimilates well into incidents, due to their high level of wildland fire experience, and the rapport built with some Incident Management Teams. The FBAT data from the Clover and Lion fires was compared to modeled fire behavior and indicated further calibration is needed. Refined and updated uses for FBAT fire behavior and fuels data will enhance data collection methods and data applications.

Goals

- Directly measure fuel treatment effectiveness
- Measure fire behavior and effects and their relationship to fuels, fire history, and treatments
- Build dataset useful for calibration of consumption, emissions, and fire behavior models
- Supply data and video useful for firefighter safety and public outreach

Fire Behavior Instruments

- Video Cameras
  - Wired thermistors trigger camera to start filming as the fire approaches
  - Camera reference poles used to assess flame length and ROS

Rate of Spread (ROS)
- Continuous temp. readings
- Anemometer
- Wind speed (until it melts)

Thermocouples
- Multiple used to capture temp. at different heights

Products and Collaborations

- Incident summaries on the effects of fuel treatments, interactions of past fires and recent fire behavior, and immediate fire effects on cultural and natural resources
- FBAT dataset used in calibration of FOFEM consumption model with USFS PSW Research Station, in press, JGR – Biogeosciences

Comparison of Recorded and Modeled Fire Behavior

Rate of spread (ROS) and flame lengths measured at FBAT sites on the Clover and Lion fires were compared to outputs generated from the “Compare Model” spreadsheet (Scott 2005) which uses the Rothermel (1972) surface fire spread model. Input data was based on site characteristics (below). Site flame heights were estimated from video, and ROS was calculated from thermocouple sensors in a diamond pattern (Simard et al. 1982). Similarities and differences were found, indicating further need to calibrate fire models and field data.

Citations


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Feedback & Data Requests

- To Order FBAT for Wildfire Incidents: Contact Carol Ewell, FBAT leader, for availability 530-559-0070. FBAT provides a personnel list to order through ROSS. Or contact Alicia Reiner 530-559-4860, alreiner@fs.fed.us.