

# ESTIMATING FIRE BEHAVIOR FROM OVERHEAD IMAGERY IN EASTERN OAK FORESTS

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We have used multiple-frame overhead infrared imagery to measure heat flux from a prescribed fire in Southeastern Ohio. These data were obtained using a specially designed wildfire airborne mapping camera that produces accurate geographic maps of short, mid, and longwave infrared emission along with very high-resolution visible images. These images may be overlaid to produce a total heat map. In-fire measurements were performed simultaneously with overhead image capture to provide a cross-calibration of ground leaving energy flux with sensor-reaching energy flux. This technique removes the effects of atmospheric absorption and uncertainties in instrument calibration. We correlated the heat release as measured by the airborne camera system to conventional measures of fire severity such as fuel burn-up. Forty plots were measured using conventional methods. Excellent agreement was obtained between conventional plot measurements of fuel consumption and the airborne heat-flux measurements. The airborne technique allows simultaneous observation of entire burn units and may provide a substantially better (higher accuracy, more synoptic view and lower cost) measure of fire characteristics than ground-based methods that are based on conventional sampling.

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