ABSTRACT

Wildfires are a complex natural hazard that are destructive, yet essential to many ecosystems in the western U.S. Influenced by a variety of factors, they cause inevitable social losses and damage to economic resources despite the effort of humans to predict their occurrence and spread. While past research has improved the application of various fire management strategies and fuel treatment techniques, it has also indicated a trend of a growing wildfire season with more frequent large and intense fires. The state of California, with high amounts of burnable vegetation and plagued by drought, has experienced these changes first-hand. In early February of 2015, the Round Fire burned over 6,500 acres of public and private land in Inyo National Forest and neighboring Mono County of California. Primarily a brush fire, the wildfire spread quickly due to strong winds and dry conditions, destroying 38 residential structures. Occurring both outside the regular wildfire season and during a period of historic drought, the circumstances under which the Round Fire occurred make it an interesting target for analysis. The research objectives of this study were to create a remotely sensed burn severity map of the Round Fire using the differenced Normalized Burn Ratio (dNBR) and to provide descriptive and statistical summaries for the landscape variables pre-fire vegetation, pre-fire fuel, elevation, slope, aspect, and fire history. Linear correlation between landscape variables was determined using Pearson's bivariate correlation and all ordinal data was tested for significantly different distributions amongst samples between burn severity classifications using the two-sample Kolmogorov-Smirnov (K-S) test. An accuracy assessment of the dNBR was conducted using verified soil burn severity points collected post-fire by Burned Areas Emergency Response (BAER) teams. A geospatial analysis of the Round Fire will not only assist with short-term recovery efforts, but help forest managers predict and mitigate future wildfires.