ABSTRACT

Increased wildfire activity throughout California over the past decade demands greater research on wildfire management approaches. Understanding natural, as well as human landscape characteristics that explain spatial patterns of wildfire potential can be used to complement traditional wildfire management approaches, such as fire suppression, by identifying high risk areas. In this study, California's wildfire potential was statistically modeled using wildfire observations from a 30-year period (1984 to 2013) and a wide variety of environmental variables. Locations of burned wildland habitat encountered between 1984 and 2013 were related to ignition sources, climate conditions, topography, and vegetation to estimate the probability of wildfire for regions of California exclusive of past wildfire occurrences. Twenty-nine variables were considered in building the wildfire probability model to determine which factors best indicate environmental susceptibility to wildfires. Two additional models, historic (1984–1988) and recent (2009–2013), were created to assess changes of wildfire probability across California over time.

Results of the long-term wildfire probability model display a heterogeneous distribution of wildfire probability across the state. Comparison between recent and historic wildfire probability values demonstrates fluctuations in wildfire potential near coastal and forested areas. Wildfire probability maps depicting the likelihood of wildfire in California can aid land as well as disaster management activities and can enhance the safety of firefighters and the public, and minimize wildland and property damages.