

Assessing Change in Fire Danger

Timothy Brown¹, Matt Jolly² and Beth Hall³

Abstract

Numerous research studies have indicated that change in wildfire is a likely consequence of global warming. These changes include a lengthening of seasons, increase in fire severity, increase in natural ignitions, increase in number of days with high fire danger and more extreme events. While these claims are ultimately related to projected increases in greenhouse gasses, recent seasonal fire activity suggests some of the anticipated changes may already be occurring globally. For example, recent years have exhibited “unusual” fire seasons in the Australia, Portugal, and the United States among other places, where record areas burned have occurred and extreme fire behavior reported.

Wildland fire danger indices can serve as a useful indicator of variability and change. Fire danger is the sum of constant danger and variable danger factors affecting the inception, spread and resistance to control, and subsequent fire damage; often expressed as a relative number indicating the severity of wildland fire danger. We have developed a daily fire danger index – energy release component (ERC) – dataset utilizing output from the 32-km gridded North American Regional Reanalysis (NARR) dataset for the period 1980-2005. NARR is a consistent and homogeneous modeled dataset of 3-hourly surface and atmospheric meteorological variables for North America. Taking relevant weather variables from NARR as input into the National Fire Danger Rating System (NFDRS) allows for generating daily fire danger indices at each of the 32 km grid points across all of North America.

This presentation will describe the results of this North American fire danger analysis to assess variability and change over the 26-year time period. While this is not a particularly lengthy time period to make claims about long-term trend, this time period does correspond well to available fire occurrence data from which claims of recent change have been stated. Though emphasis is given to North America in the analysis, this concept of assessing change is relevant to the global fire community. A closely related gridded dataset, though coarser in spatial resolution, is available for a global analysis for the period 1950-present.

This abstract is for an oral presentation

¹ Associate Research Professor and Director CEFA, Desert Research Institute, Reno, Nevada, USA.

² Ecologist, USDA Forest Service, Missoula, Montana, USA.

³ Assistant Research Scientist, Desert Research Institute, Reno, Nevada, USA.