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A New Statistical Tool for Delineating Fire Seasons in California

“Prototype point processes” is a method for summarizing repeated events within a spatial region and over time. USGS scientist Jon Keeley and colleagues from the University of California have published a study in the *Journal of Time Series Analysis* that demonstrates the potential benefit of this statistical tool for analyzing the seasonal distribution of wildfires in California.

Prototyping uses historic records of real events — their spatial location, season of occurrence, size of surface area and other parameters — and generates a summary record that represents the pattern of events known for each season of the year.

In this study, prototype summaries are constructed for varying time intervals using California wildfire data from 1990 to 2006, as well as summaries of spatial patterns of fires within each wildfire season. Results suggest that there are different annual cycles of severe fire weather in the north versus the south of California.

Applied to wildfire planning, point process models may be useful in the delineation of start and end dates for fire seasons — seasons with high numbers of fires; seasons with one dominant fire event, and seasons of relative dormancy in fire activity.

This method should avoid analytical problems that typically affect the study of spatial and temporal patterns of wildfire size with parametric statistical tools. This new application offers resource managers a useful method for visualizing and analyzing wildfire patterns and seasons.

Management Implications

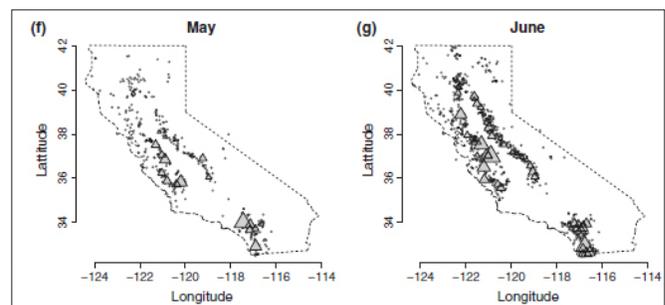
- A statistical method is presented that circumvents problems that plague the study of spatio-temporal patterns in wildfire size with parametric models.
- Point process models may be useful in the delineation of start and end dates for fire seasons. The authors propose that there are three different seasons: one of high numbers of fires, one of high area-burned and one of relative dormancy in fire activity.
- Application of point process models to California wildfires data from 1990 to 2006 suggest there are different annual cycles of severe fire weather in the northern versus the southern portion of the state.

THIS BRIEF REFERS TO:

Nichols, K., F.P. Schoenberg, D. Diez, J.E. Keeley, A. Bray. 2011. The Application of Prototype Point Processes for the Summary and Description of California Wildfires. *Journal of Time Series Analysis* 32: 420-429. doi: 10.1111/j.1467-9892.2011.00734.x

<http://www.werc.usgs.gov/seki>

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4278>



Point process analysis can produce summaries of fire events within a spatial area, plotting “prototype fires” that represent the historically expected distribution of fires and fire size for each season. Image courtesy of Blackwell Publishing Ltd.