



## Research Brief for Resource Managers

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# Human Presence Diminishes the Importance of Climate in Determining U.S. Fire Activity

Syphard, A., J.E. Keeley, A. Pfaff, and K. Ferschweiler. 2017. Human presence diminishes importance of climate in driving fire activity across the United States. *PNAS* 114(52):13750-13755. [doi: 10.1073/pnas.1713885114](https://doi.org/10.1073/pnas.1713885114)

A number of studies project worsening wildfire conditions in the future. However, both climatic and direct human impacts influence wildfires, and the importance of specific factors likely varies geographically. This can make it difficult for resource managers to pinpoint and plan for the exact factors driving wildfire activity.

In a study published in the *Proceedings of the National Academy of Sciences*, researchers with the Conservation Biology Institute and the U.S. Geological Survey showed that, across the U.S. on landscapes dominated by humans, climate has played a relatively small role in determining wildfire activity.

The study used nearly 40 years of fire history data from federal lands across the contiguous U.S. and correlated fire activity to climate and human attributes within regions of similar climate. The overall strength of fire-climate relationships varied substantially across the U.S. As distance from developed areas (including roads and population density) increased, year-to-year variation in

### Management Implications

- For some subregions across the continental U.S., the presence of humans is more important than climate as a fire driver.
- Increased human ignitions, increased grass and exotic plant invasions, fragmented habitats, and altered forest canopies all can change a local fire regime more quickly and more directly than the climate.
- These more direct drivers are more easily and immediately manageable than climate.
- This research suggests that when making important and potentially expensive fire management decisions, policymakers and land managers may consider geographical context and human influence.

temperature and precipitation played a significantly greater role in determining fires.

The results of this paper indicate that altered precipitation and temperature are a concern for those parts of the U.S. that exhibit a strong fire-climate relationship. However, in areas with a larger human presence, direct anthropogenic factors have greater influence than climate on fire activity.

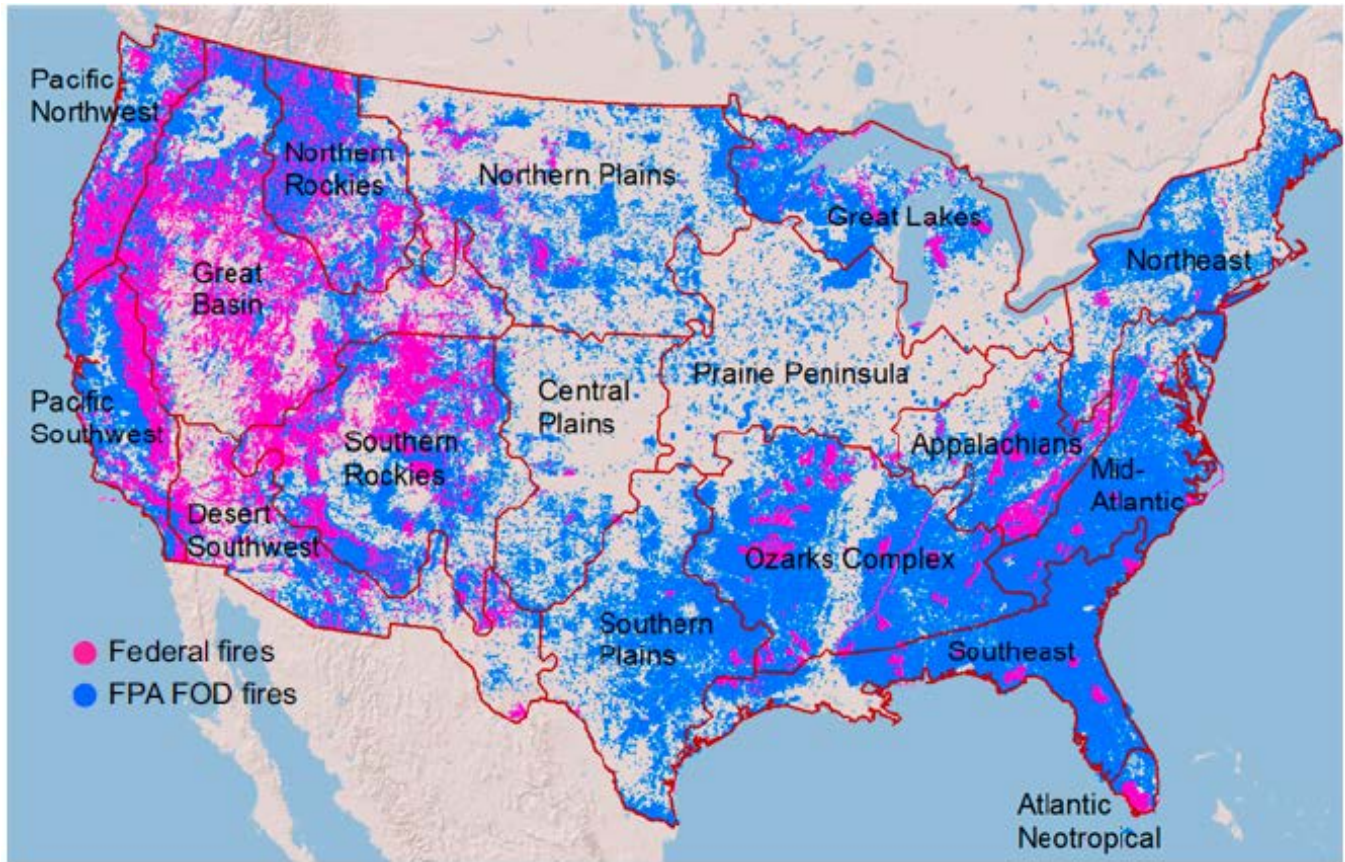


Figure 1. Occurrence locations for fires on federal lands only (1972-2010) and for all fires (1992-2010) across the 17 National Ecological Observatory Network (NEON) climate region domains in the continental United States.