

# Severe wildfires not increasing in western dry forests, study finds

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Credit: University of Wyoming

Severe wildfires are often thought to be increasing, but new research published today in the international science journal *PLOS ONE* shows that severe fires from 1984-2012 burned at rates that were less frequent than historical rates in dry forests (low-elevation pine and dry mixed-conifer forests) of the western USA overall, and fire severity did not increase during this period.

The study by Dr. William Baker of the University of Wyoming compared records of recent severe fires across 63 million acres of [dry forests](#), about 20% of total conifer forest area in the western USA, with data on severe fires before A.D. 1900 from multiple sources.

"Infrequent severe fires are major ecosystem renewal events that maintain biological diversity, provide essential habitat for wildlife, and diversify forest landscapes so they are more resilient to future disturbances," said Dr. Baker. "Recent severe fires have not increased because of mis-management of dry forests or unusual fuel buildup, since these fires overall are occurring at lower rates than they did before 1900. These data suggest that federal forest restoration and wildfire programs can be redirected to restore and manage severe fires at historical rates, rather than suppress them."

Key findings from the new study:

- Rates of severe fires in dry forests from 1984-2012 were within the pre-1900 range, or were less frequent, overall across the western USA and in 42 of 43 smaller analysis regions.
- It would take more than 875 years, at 1984-2012 rates, for severe fires to burn across all dry forests, which is longer than the range of 217-849 years across pre-1900 forests. These forests have ample time to regenerate after severe fires and reach old age before the next severe fire.

- Severe fires are not becoming more frequent in most areas, as a significant upward trend in area burned severely was found in only 3 of 23 dry pine analysis regions and 1 of 20 dry mixed-conifer regions in parts of the Southwest and Rocky Mountains from 1984-2012. Also, the fraction of total fire area that burned severely did not increase overall or in any region.
- Although not yet occurring in most areas, increases in severe fire projected by 2046-2065 could be absorbed in most regions without exceeding pre-1900 rates, but it would be wise to redirect housing and infrastructure into safer settings and reduce fuels near them.

Pre-1900 rates of severe fires were calculated from land-survey records across 4 million [acres](#) of dry forests in Arizona, California, Colorado, and Oregon, and analysis of government Forest Inventory and Analysis records and early aerial photography. These reconstructions are corroborated by paleo-charcoal records at seven sites in Arizona, Idaho, New Mexico, and Oregon.

Dr. William L. Baker is an Emeritus Professor in the Program in Ecology/Department of Geography at the University of Wyoming, Laramie, Wyoming. He is the author of over 120 peer-reviewed scientific publications, and also contributed to the new book, "The Ecological Importance of Mixed-Severity Fires: Nature's Phoenix," which features the work of 27 scientists from around the world.

His new study, titled "Are high-severity fires burning at much higher rates recently than historically in dry-forest landscapes of the western USA?", was published Sept. 9 in the international scientific journal *PLOS ONE*, and is freely available at the *PLOS ONE* website.

**More information:** *PLOS ONE*,  
[dx.plos.org/10.1371/journal.pone.0136147](https://doi.org/10.1371/journal.pone.0136147)

Provided by University of Wyoming

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