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Modern Deviations from Pre-Euroamerican Settlement Fire Frequencies in California

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Abstract: California, USA, faces an increasing threat from fire regime changes, which have substantial ecological and socioeconomic impacts. Of particular concern is the rising frequency of fires in certain ecosystems, such as the chaparral systems of Southern California, which are suffering type conversion to weedy grasslands. At the same time, recurrent-fire ecosystems, such as the conifer forests of the Sierra Nevada, are experiencing major increases in fire severity, partly because of a long-term fire deficit. This lack of fire is leading to fuel accumulation at the stand level, making these forests more susceptible to high-intensity burning. Safford and Van den Water (2014) introduced the Percentage Fire Return Interval Departure (PFRID), a widely used metric for quantifying deviations in current fire frequencies from historical norms. However, this decade-old tool has some limitations: it does not represent all vegetation types, and its baseline map reflects current conditions rather than historical ones. In this work, we provide new measurements of fire deviations in California for 2024 with new improvements: incorporating new vegetation types, expanding coverage beyond federal lands, adopting updated baseline values, and integrating an uncertainty measure. This enhanced product addresses critical information gaps, providing valuable support for fire and ecosystem management in California.

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