

# Drought onset is speeding up in the United States

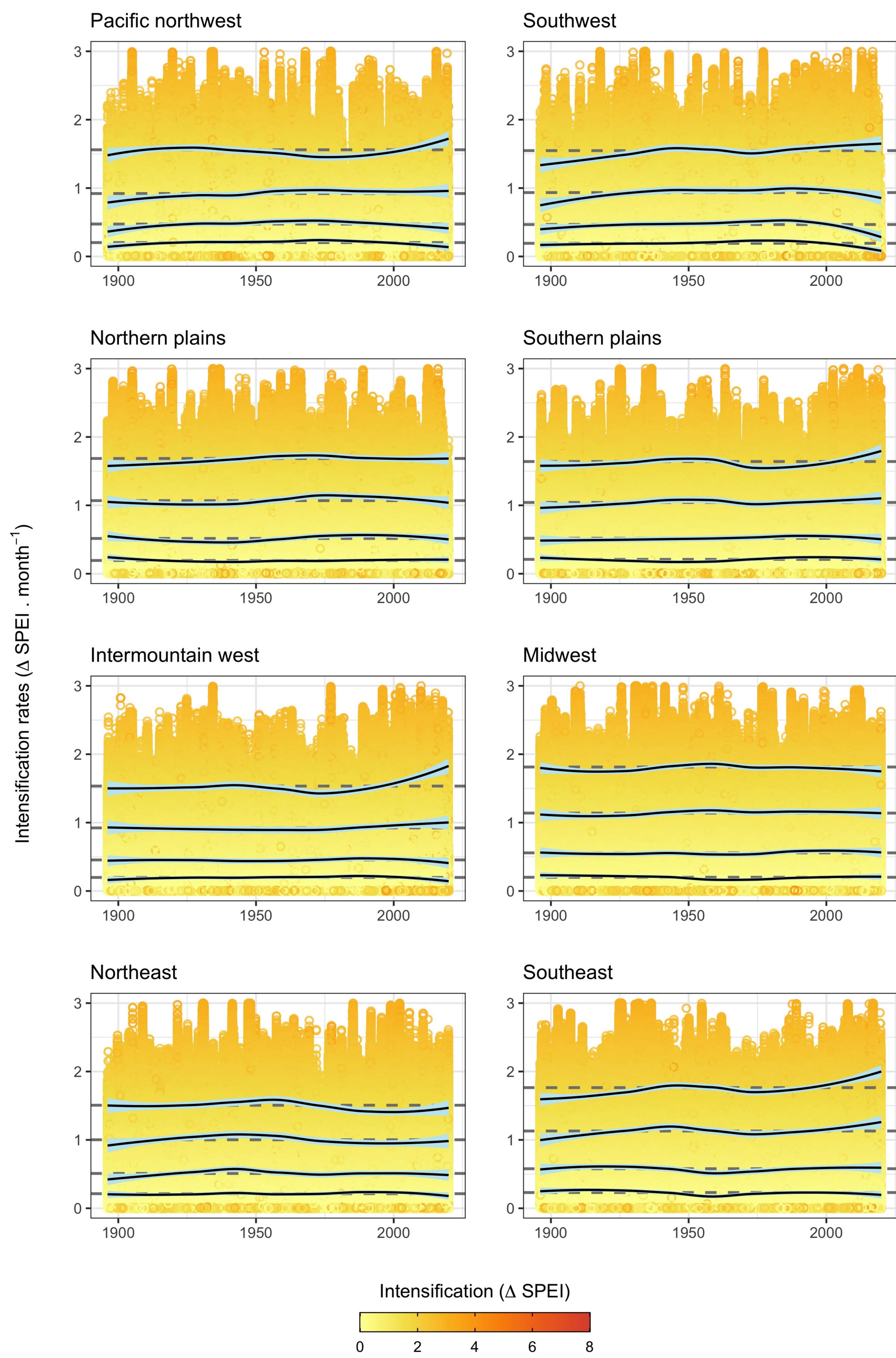
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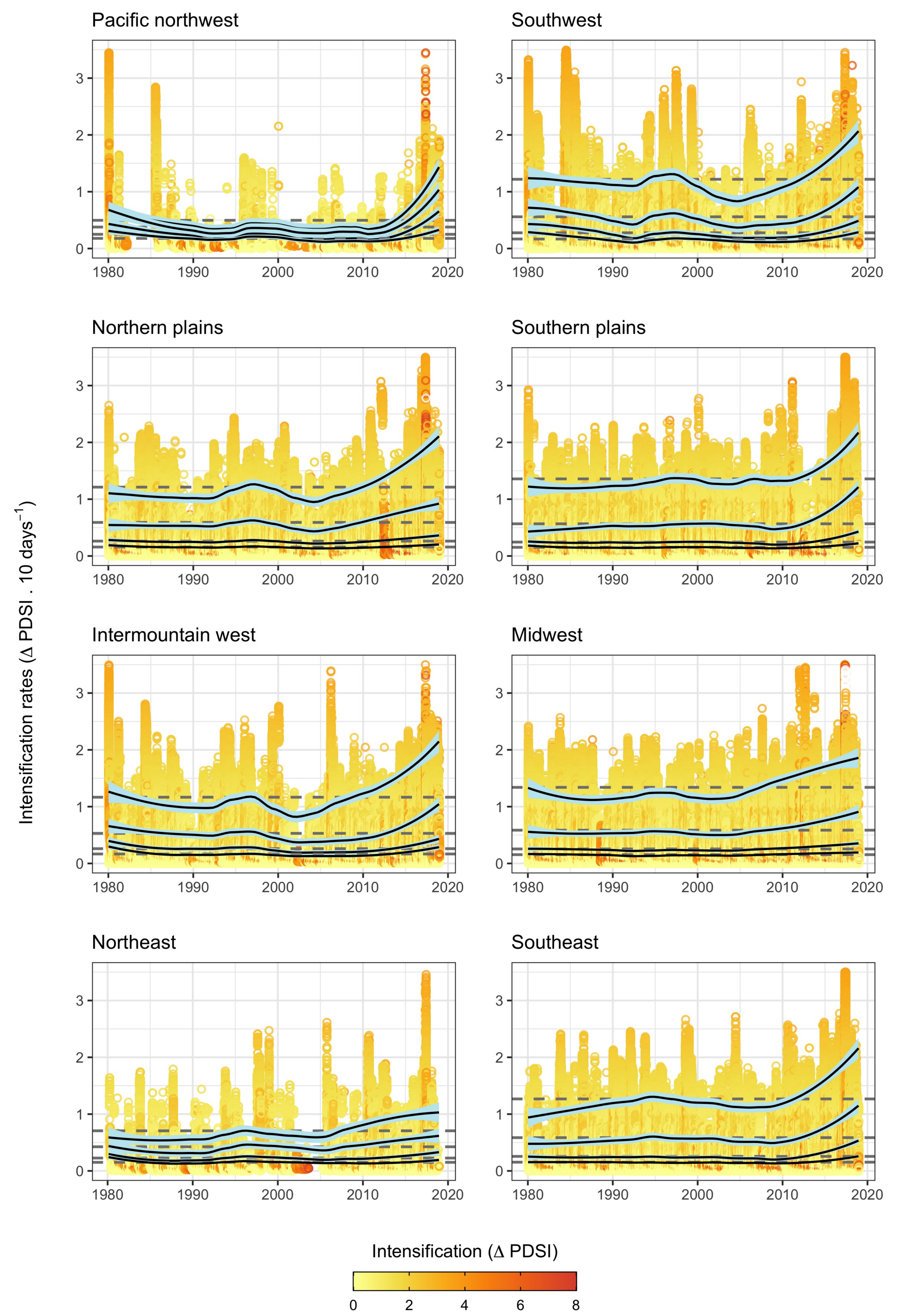
Drought has been traditionally characterized as a slow process that requires seasons or even years to fully develop. Recent fast-evolving drying events, however, have challenged our forecasting and response capabilities. In this context, a fundamental question emerges: **Are droughts setting in more quickly in the United States?**

**Droughts exhibited quasi-periodic multidecadal oscillations in onset speeds over the long term (1890-2018). The intensification rates of recent droughts are comparable to those of the fastest-evolving events of the last century.**



Drought intensification rates based on changes in SPEI-6 obtained from PRISM. The corresponding drought intensification values are indicated in warm colors. The solid lines show smoothed trends in the median, 75<sup>th</sup> and 95<sup>th</sup> quantiles, and maximum drought intensification rates. The light blue shading represents the 95% confidence intervals for the smoothers. The dashed lines depict the median, 75<sup>th</sup> and 95<sup>th</sup> quantiles, and maximum drought intensification rates for 1890-2018.

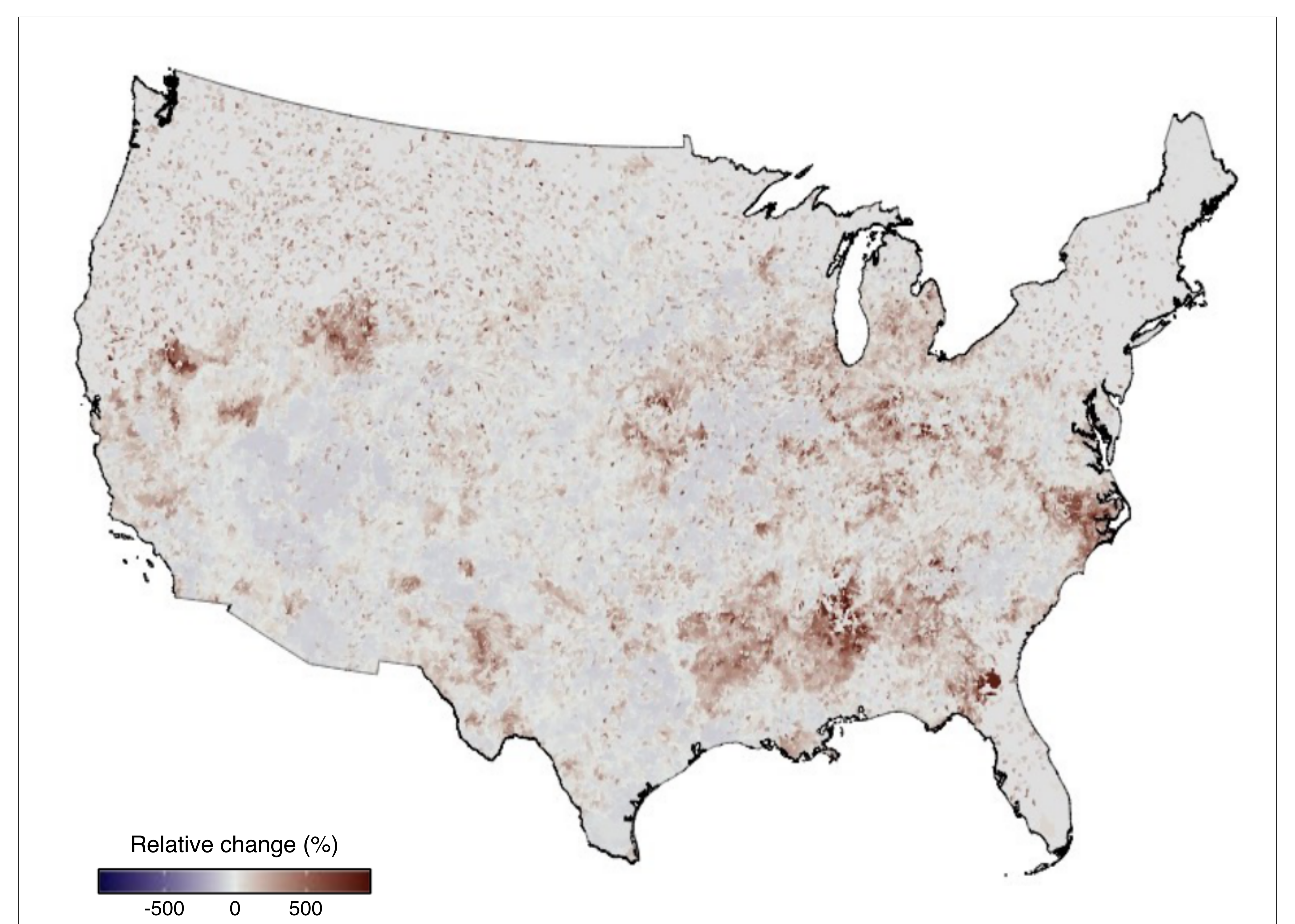
**The most rapid droughts have been speeding up since ~2005, resulting in events up to 10 times quicker than the fastest onsetting droughts of the previous 14 years.**



Drought intensification rates based on changes in PDSI obtained from gridMET. The corresponding drought intensification values are indicated in warm colors. The solid lines show smoothed trends in the median, 75<sup>th</sup> and 95<sup>th</sup> quantiles, and maximum drought intensification rates. The light blue shading represents the 95% confidence intervals for the smoothers. The dashed lines depict the median, 75<sup>th</sup> and 95<sup>th</sup> quantiles, and maximum drought intensification rates for 1979-2018.

## Acknowledgments

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Changes in drought intensification rates between 2005-2018 and the previous 14 years for intensification rates corresponding to the 95<sup>th</sup> percentile. Changes are expressed as the percentage of the difference between drought intensification rates in 2005-2018 and 1991-2004 relative to 1991-2004.