

REGIONAL HOTSPOTS FOR CLIMATE CHANGE

Based on a recent study submitted for publication.

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Views expressed here are those of the authors and do not necessarily reflect the views of Scripps Institution of Oceanography. Funded by Edward Frieman Endowment to UCSD.

NORTHERN CALIFORNIA

REGION 1 of 6



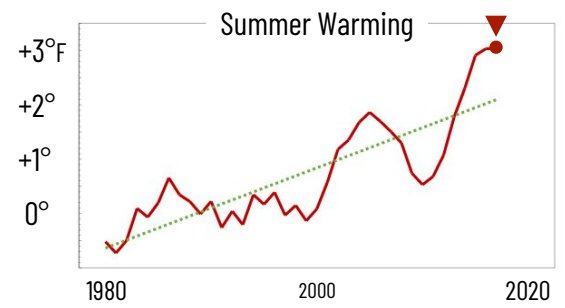
Hotter & drier with shrinking wet seasons, mega drought & fires...

There are many many such climate hot spots around the world. We are highlighting six of these in this series:

Northern California, North China, Amazon, Mediterranean, South Africa and Southeastern US

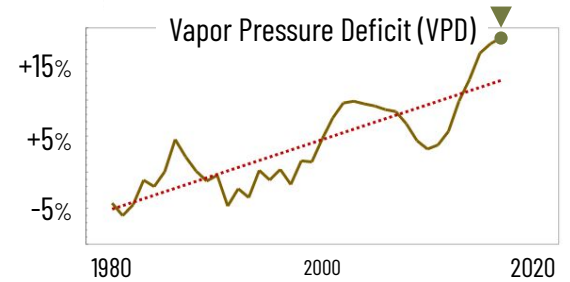
! HOTTER SUMMERS

Summer is now hotter by more than 3°F compared with early 1980s¹.



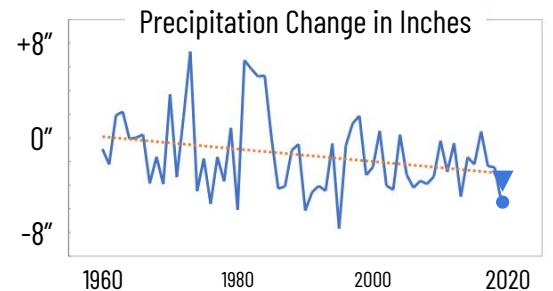
! DRIER SUMMERS

Drying is measured by vapor pressure deficit, VPD. In the last 40 years, VPD increased by more than 20%¹. Wildfires increase exponentially with VPD².



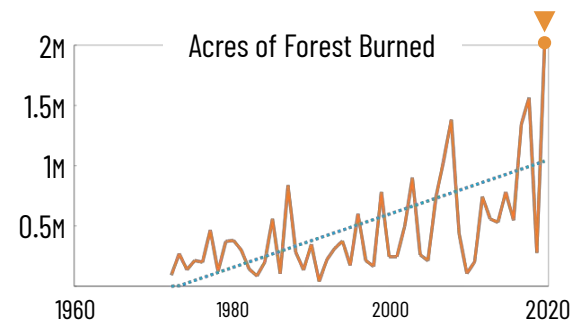
! DELAYED WET SEASON

During the last four decades, fall precipitation has decreased by more than 25% with moderate increases in winter precipitation¹, leading to an overall delay of rainy season by 27 days³.



! WORSENING FIRE SEASON

The annual area burned per decade has increased fourfold from the 1970s to now. 10.9 million acres burned during the current decade to be compared with California's forested area of only 33 million acres^{2,4}. The direct and indirect cost of the record breaking 2018 fires was \$150 billion; the 2018 record was broken by the 2020 fires⁵.



RECOMMENDATIONS:

Water Security

Accelerating summer warming, increasing vapor pressure deficit, a shrinking wet season, fourfold increase in burned area of forests, and a multi-decadal mega drought have major implications for California's water security, particularly for its legendary agricultural industry⁶.

Resilience

Within 10 years, California must prepare for at least a 50% worsening of the extremes witnessed thus far⁷. Statewide plans and efforts are urgently needed to build resilience to safeguard the well-being of its people, including their mental⁸ and physical⁹ health; protect their homes from fires; and prepare the agricultural industry and forest ecosystems to cope with and adapt to worsening warming, drying and water deficits.

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Data Sources: 1) Cole, Hsu, Versaci, Zhang & Ramanathan, 2021, *In Review*; 2) Williams et al., 2019, *Earth's Future*; 3) Lukovic et al., 2021, *Geophysical Research Letters*; 4) National Interagency Fire Center, 2021; 5) Wong et al., 2020, *Nature Sustainability*; 6) Cooley, 2020, *Pacific Institute*; 7) Xu, Ramanathan & Victor, 2018, *Nature*; 8) Silveira, Mishra, et al., 2021, *Int. J. Environ. Res. Public Health*; 9) Al-Delaimy, Ramanathan, & Sánchez Sorondo, 2020. *Health of People, Health of Planet & Our Responsibility*. Springer Online Book.

