

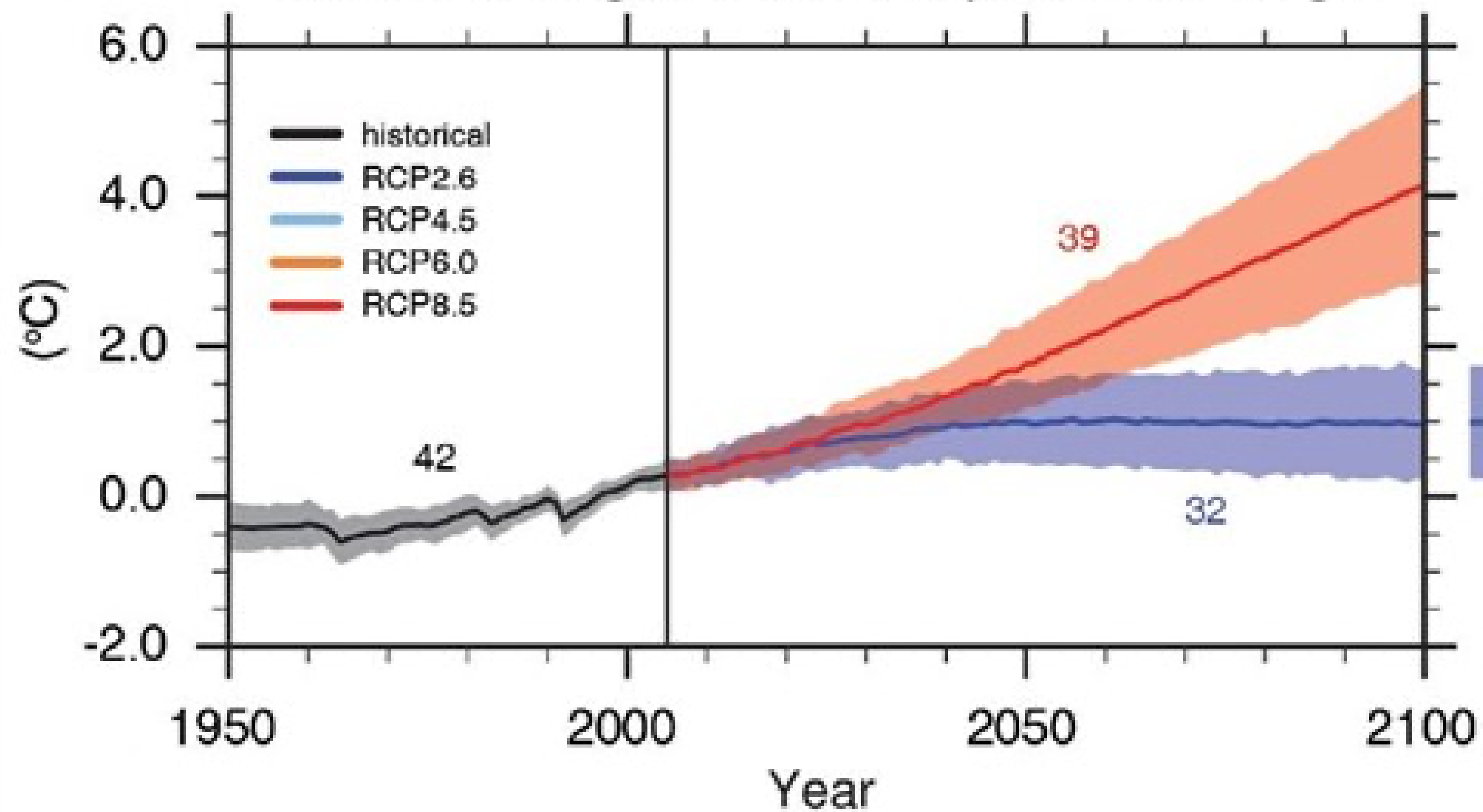
Los Angeles January 2025 fires

Climatic changes driving increased fire exposure in CA, while vulnerability is increasing

LeRoy Westerling, May 5, 2025

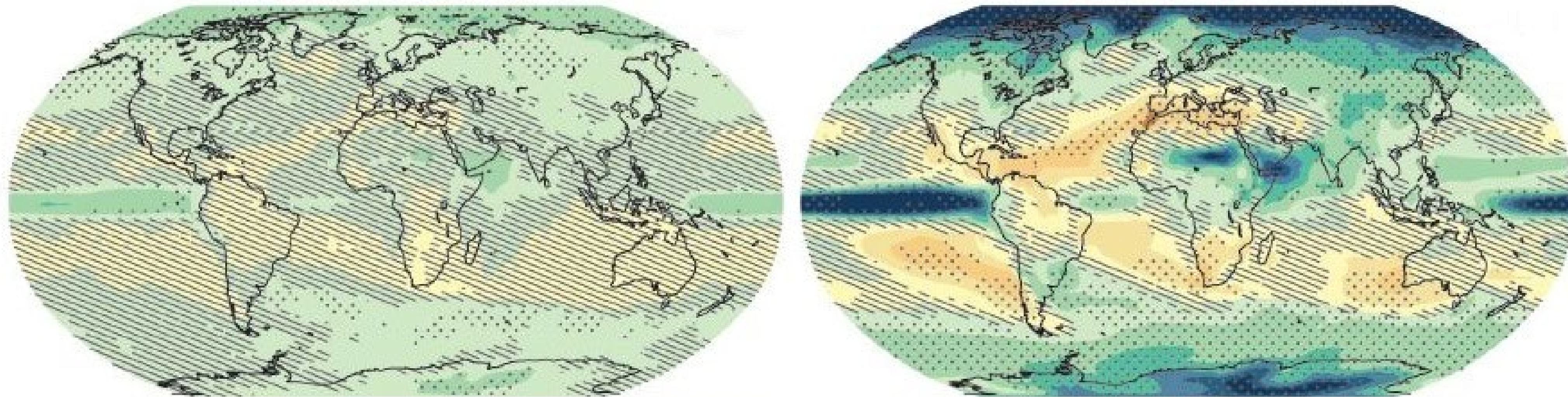
Warming temperatures

Global average surface temperature change



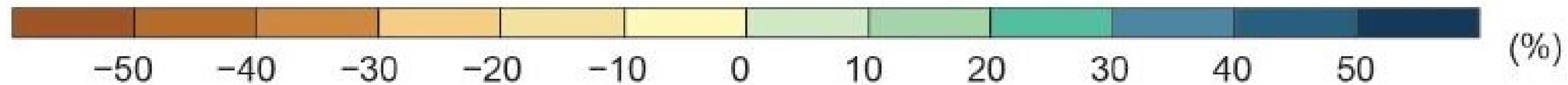
+ modest changes in precipitation

Change in average precipitation (1986–2005 to 2081–2100)

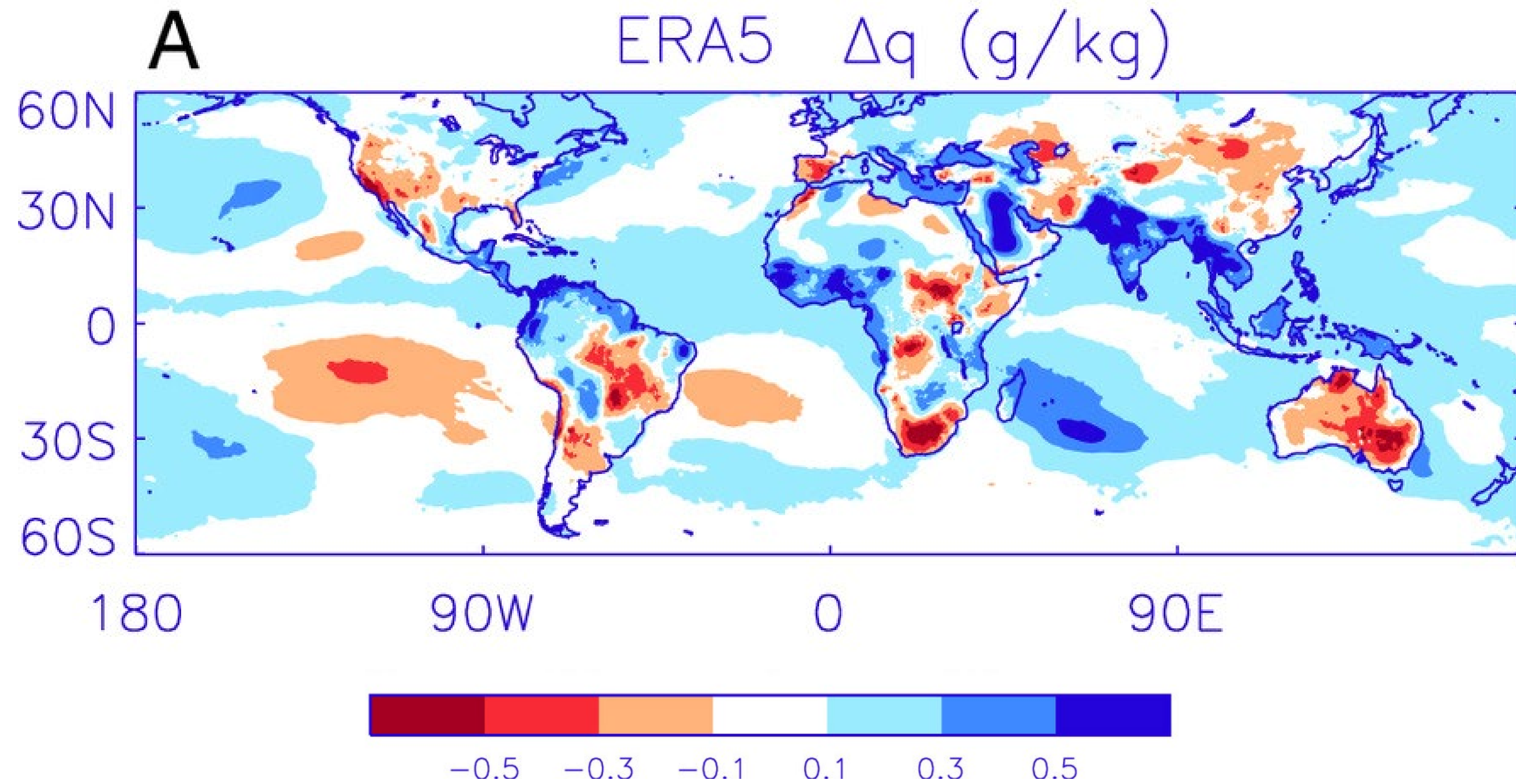


RCP 2.6

RCP 8.5

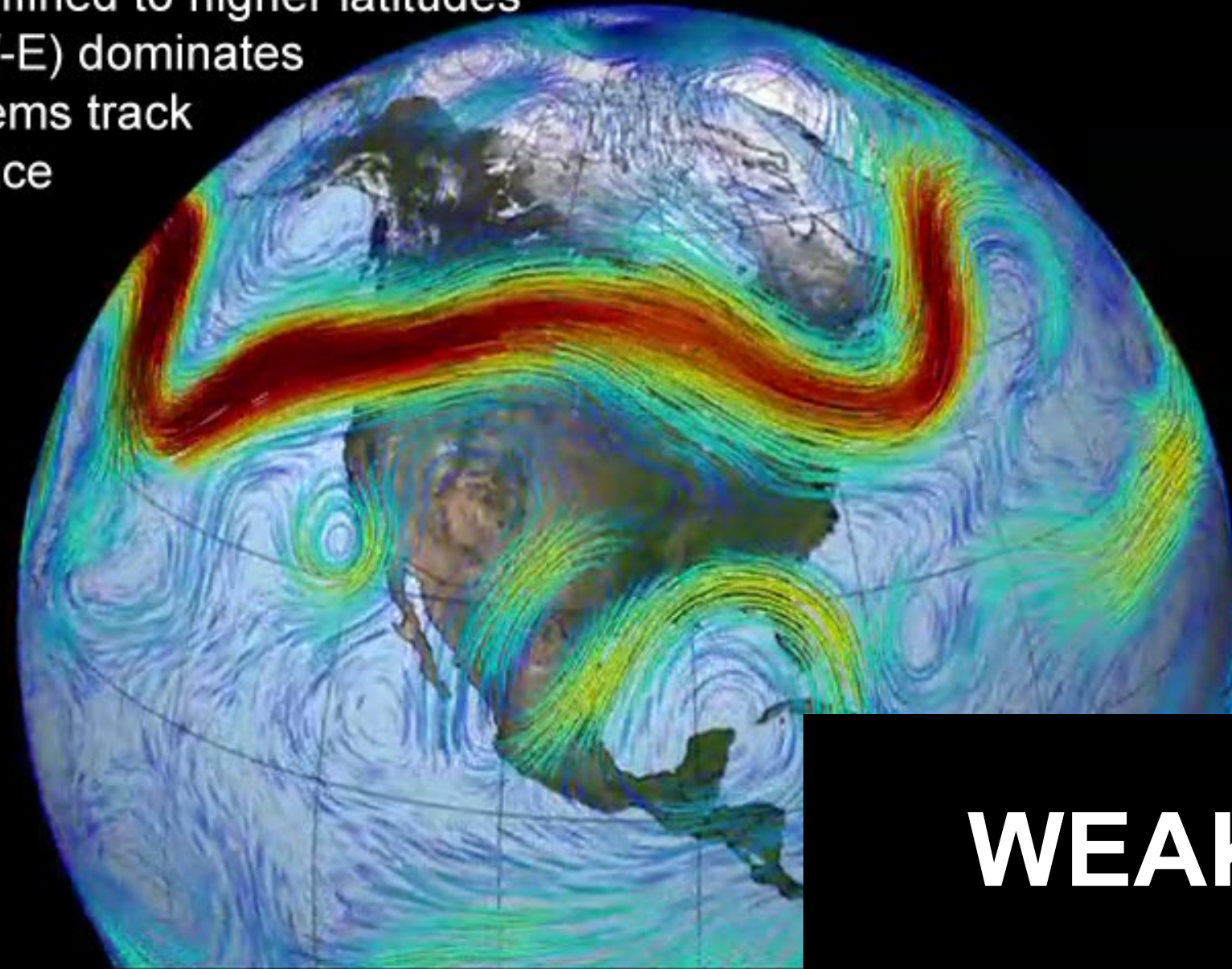


Have led to specific humidity declining in California



Strong Jet Stream

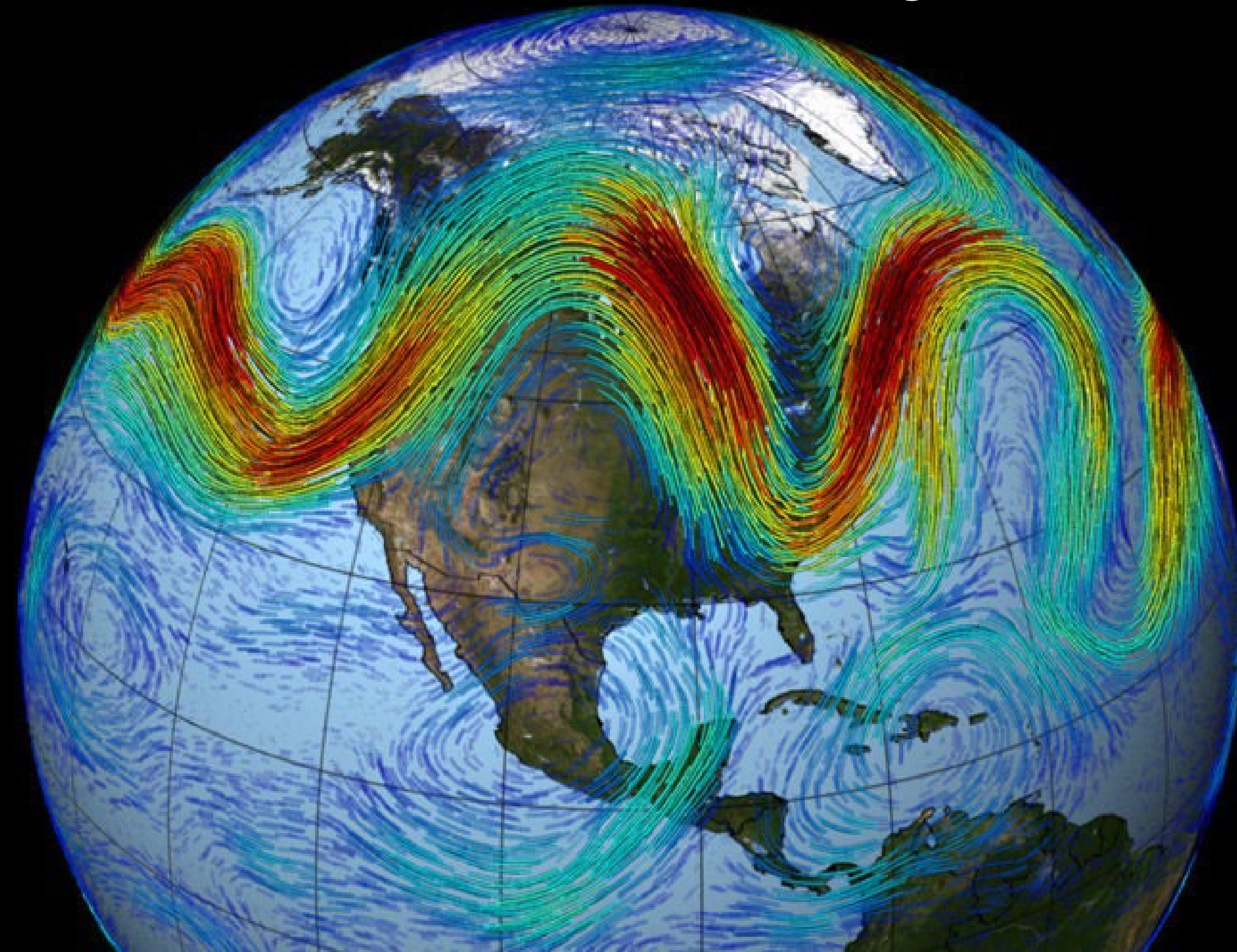
- jet stream confined to higher latitudes
- zonal flow (W-E) dominates
- weather systems track quickly at surface



Precipitation is becoming more variable...

WEAK -> more variability, stalled

as the pole warms faster than the equator, the jet stream slows and weather patterns become more persistent



Increased T -> more evaporation

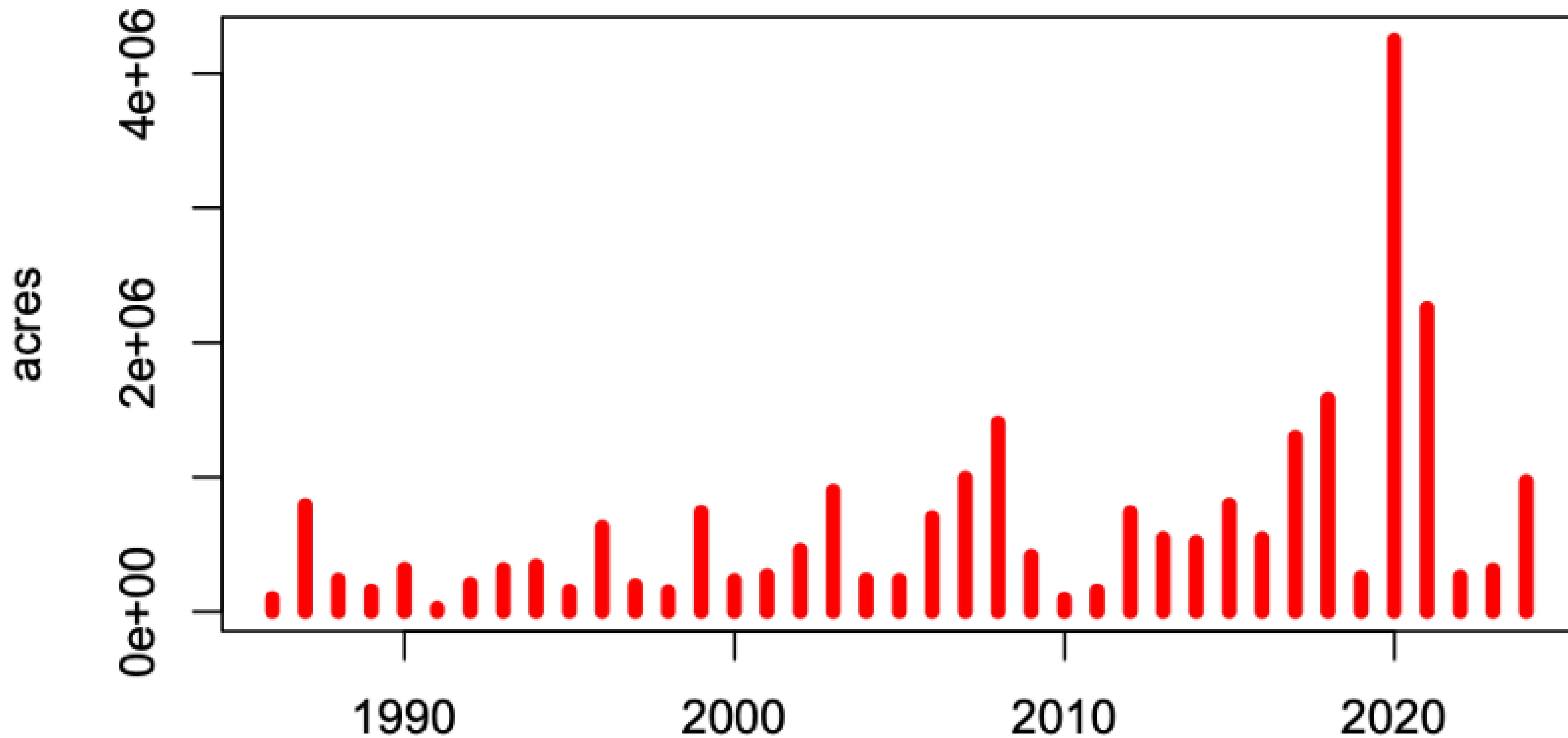
More evaporation + flat precipitation -> more flammable fuels for longer

Increased precipitation variability -> longer fire seasons

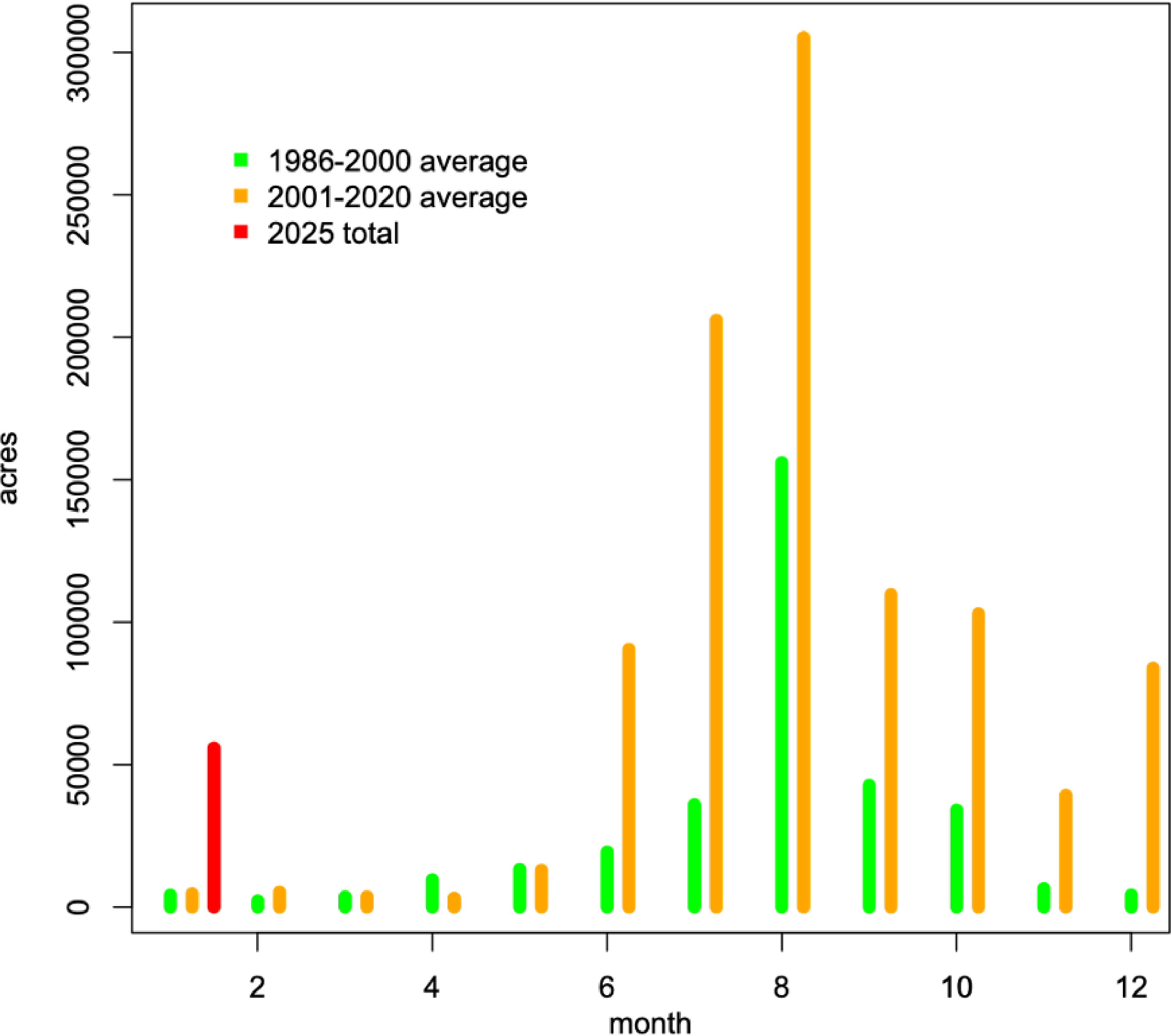
& more wet -> dry “whiplash” fostering growth

Longer duration weather conditions -> ?higher risk of longer wind events?

annual California area burned in large fires

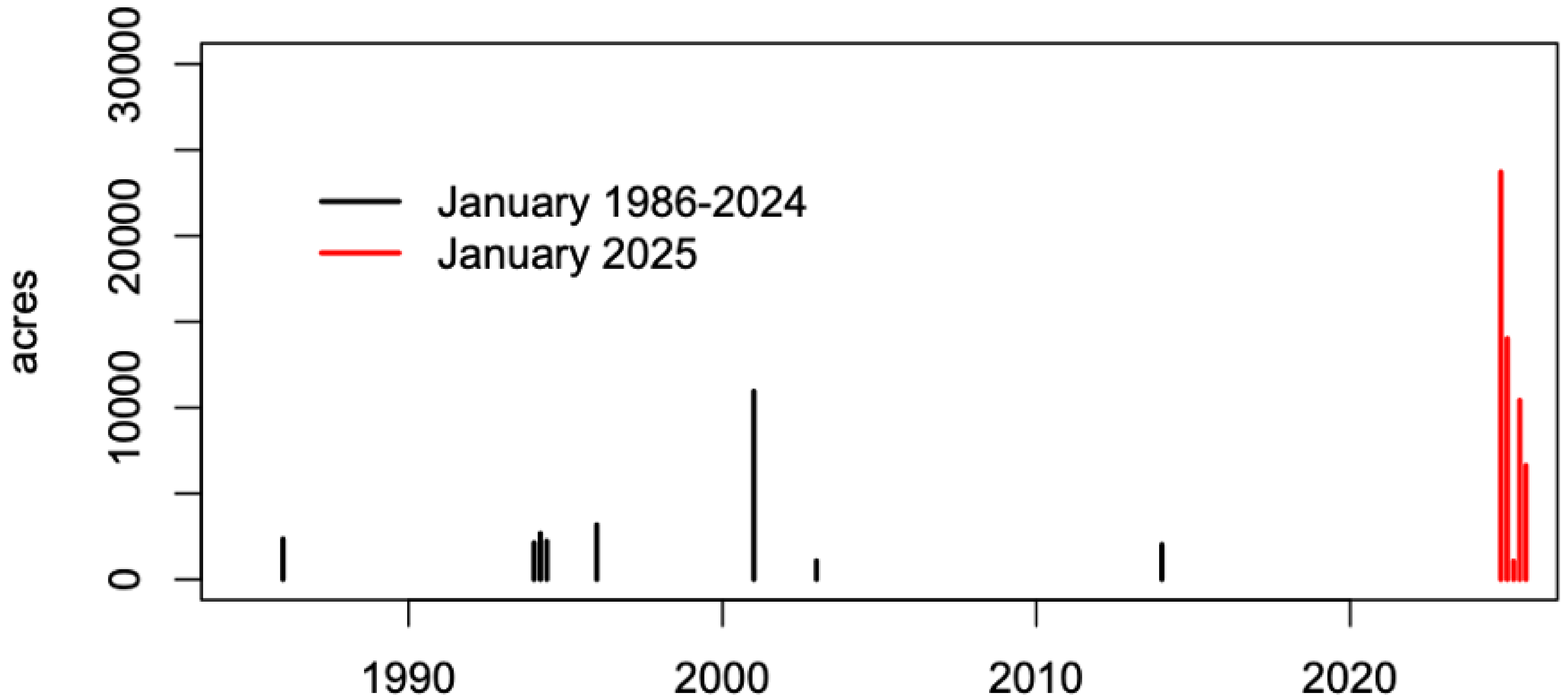


average California area burned by month*



*large (> 1000 acre) fires

January fire sizes in California - all large fires since 1984

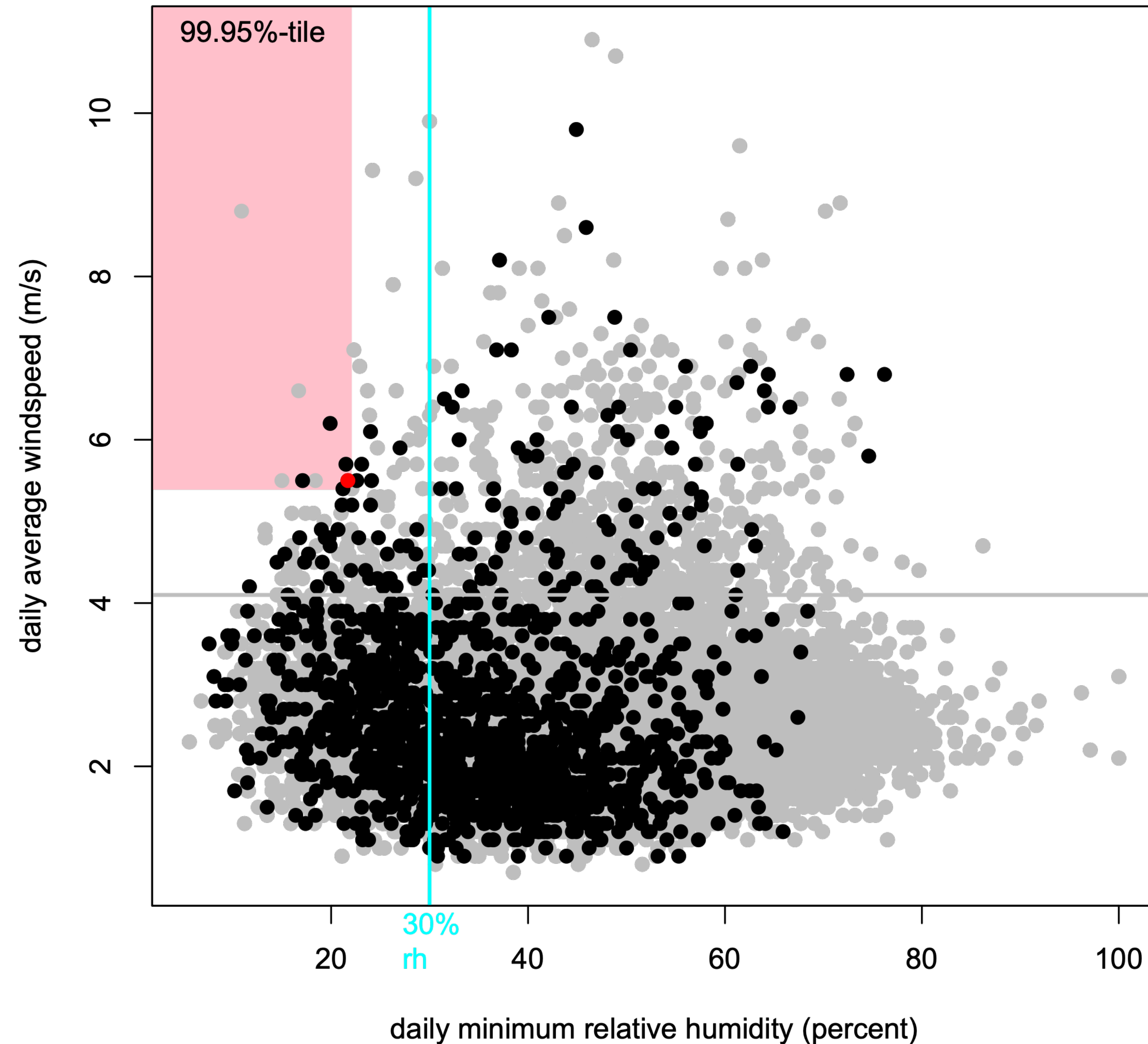


Palisades CA daily min rh vs average windspeed

● All 1979-2025

● Jan 1979-2025

● Jan 8, 2025

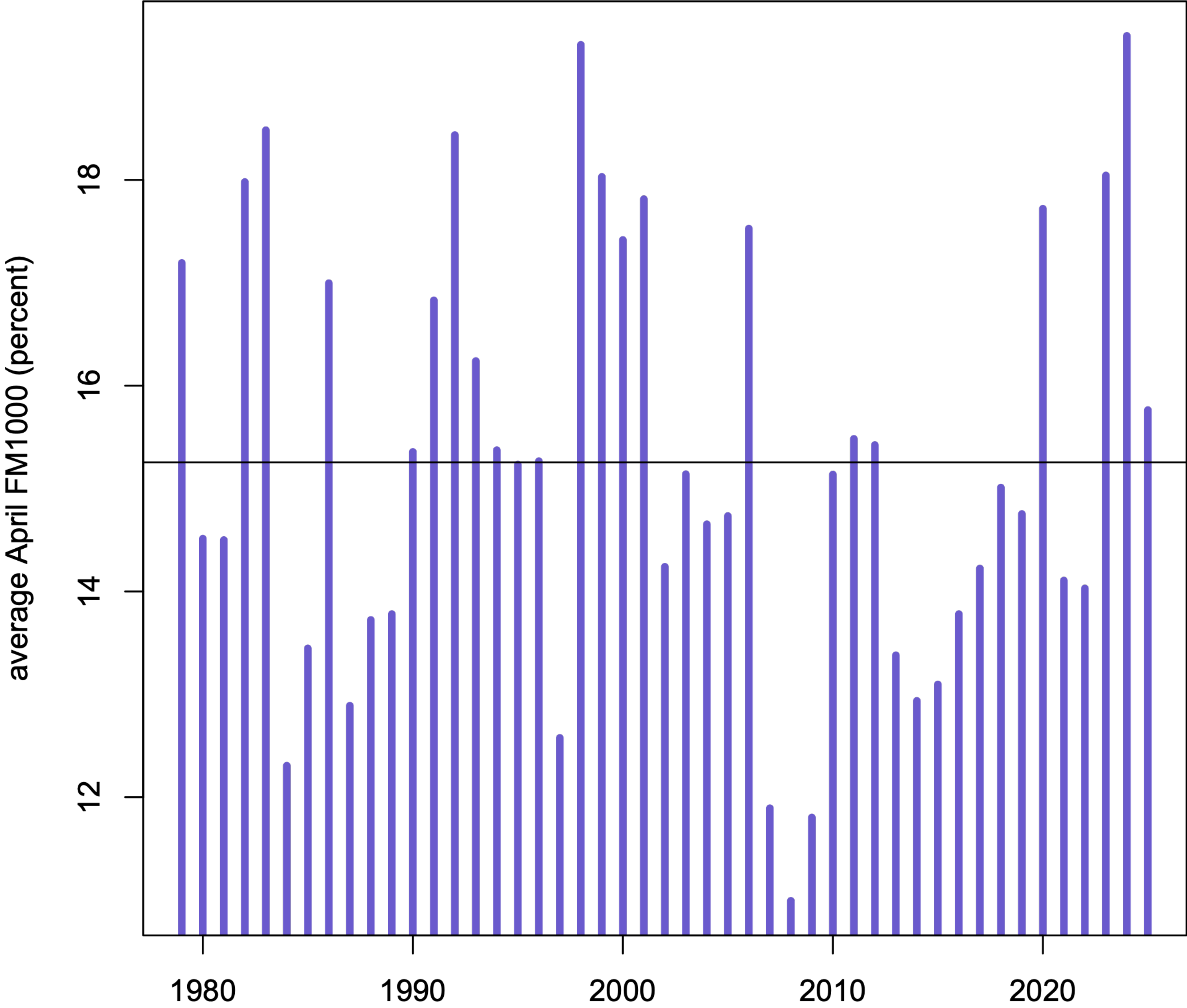


Minimum rh ~ 96th percentile

Average windspeed ~ 98th percentile

Conjoined ~ 99.95th percentile

preceeding year April moisture conditions relatively wet



California's vulnerability to extreme fires is growing:

Fires in the wildland-urban interface account for 3/4 of most damaging CA fires

CA Wildland-urban interface expanded 17% since 1990 (Kumar et al. 2025).

WUI housing units increased 40% since 1990 (PPIC 2024).

CA Inflation-adjusted home values increased over 50% since 1990 (PPIC 2024).