

California Precipitation Variability in a Warming World

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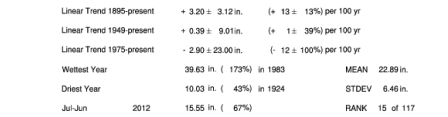
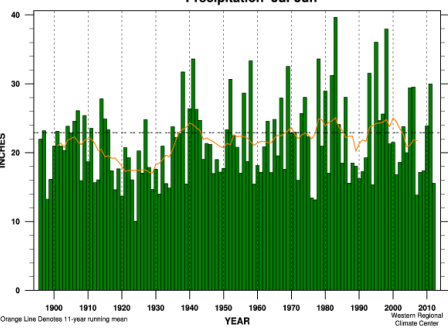
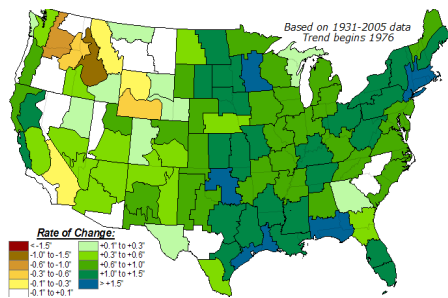


Figure 3: Percent change total annual precipitation from 1925-2007 at 14 NOAA stations in California. Stations are labeled with average total annual rainfall in mm and arranged North to South with error bars. Stations in the North show larger trends in general. Overall, no trends in California are significant when accounting for a 95% confidence interval.

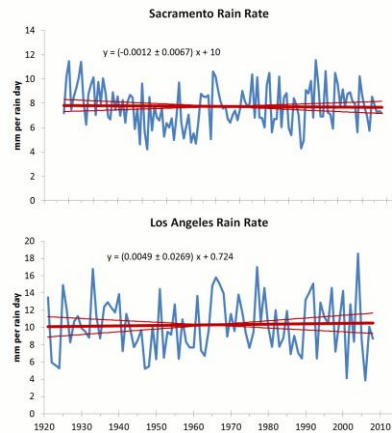


Figure 4: Average precipitation per day (for days with a measurable amount of rainfall) for the two longest daily records, Sacramento (top) and Los Angeles (bottom). Units of the slope in the trend equations are (average mm of rain per rain day)/year. Neither record contains a significant trend in the daily rain rate, or rain intensity.

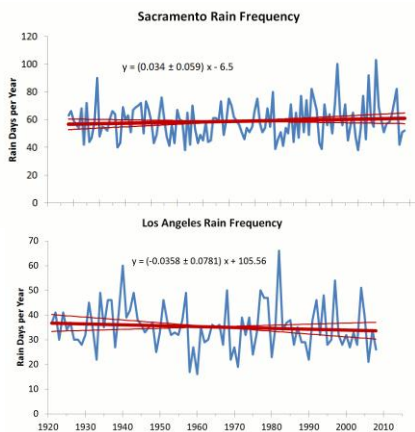


Figure 5: Number of days with measurable rain. Units of the slope in the trend equation are (number of rain days per year)/year. Neither record contains a significant trend in the frequency of rain.

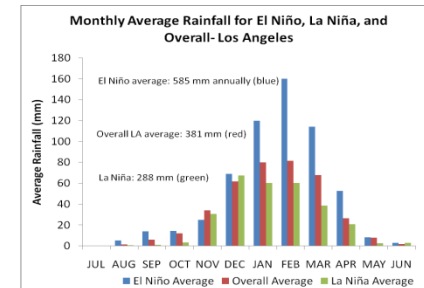


Figure 6. Comparison of seasonal rainfall distribution for El Niño, La Niña, and all years in Los Angeles. El Niño years display around 200 mm more rainfall than normal on average, and a distribution concentrated in the late winter months. La Niñas have around 100 mm less rainfall, and the seasonal peak rainfall occurs earlier in the rain year, in December.

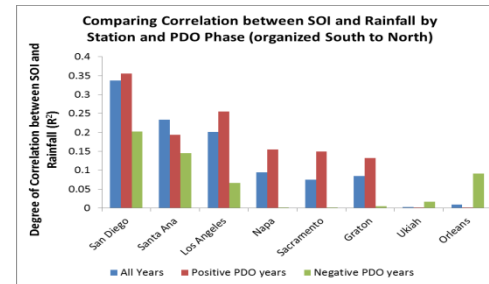


Figure 7. R² values relating SOI and rainfall data, arranged South-North and by PDO phase. Southern California rainfall is much more correlated with SOI, especially during the positive PDO.

SUMMARY

- Precipitation has increased in Northern and central California, decreased in Southern California during the warming 20th Century.
- Precipitation has increased with more winter rains, moderate and heavy rain days in all regions
- Precipitation is higher during El Niño years, especially during positive PDO phases
- Most flooding events occur during non-El Niño years