Causes of recent changes in extreme wildfire in California's South Coast

From the perspective of meteorological circulation and decadal variability

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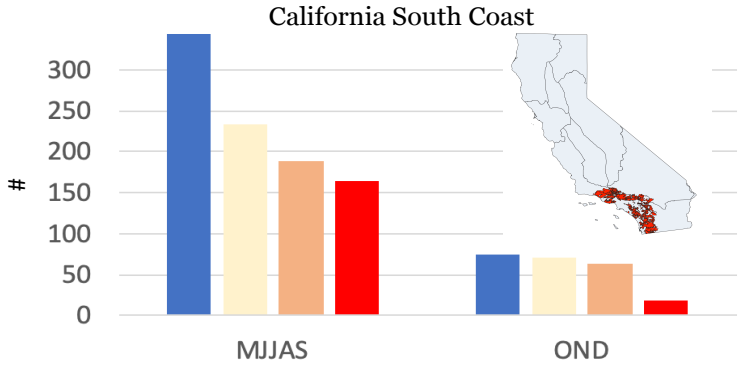
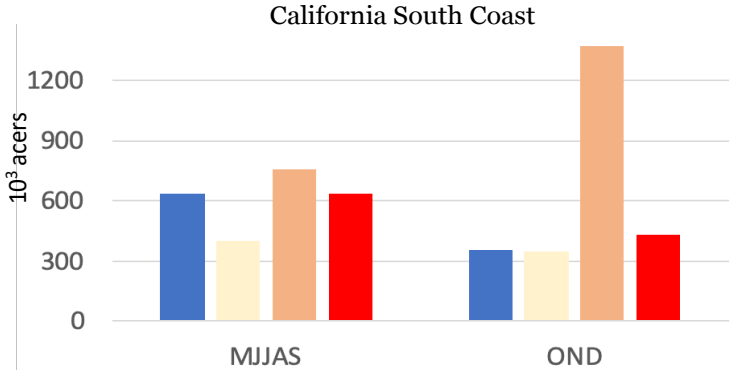
Wildfire in California's South Coast

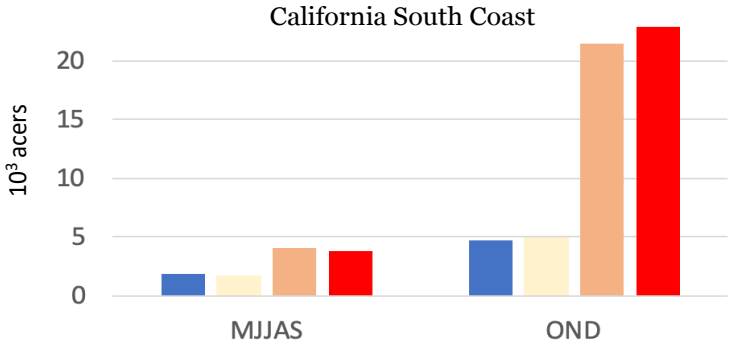
a) Fire Cases (burned area > 100 acres)

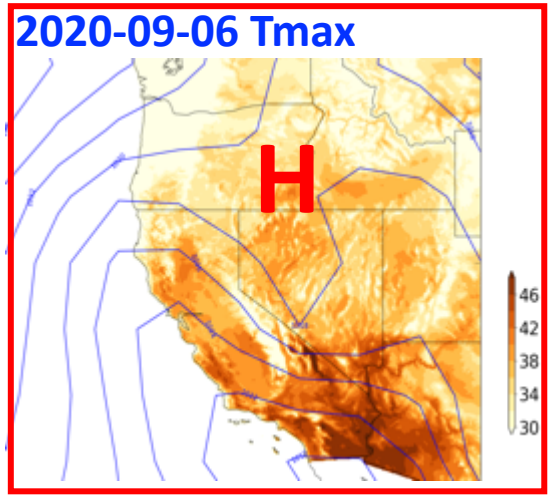


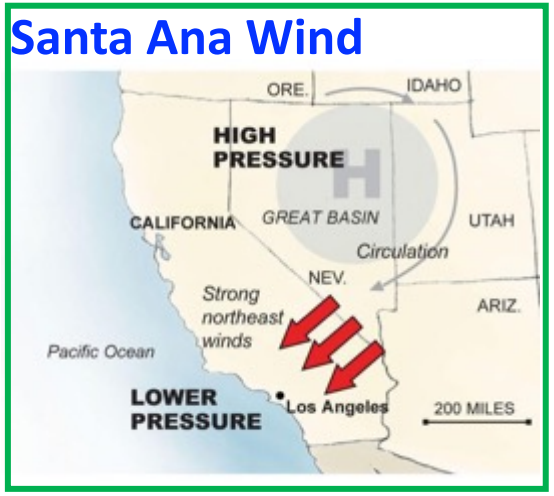
b) Total Burned Area



c) Average Burned Area

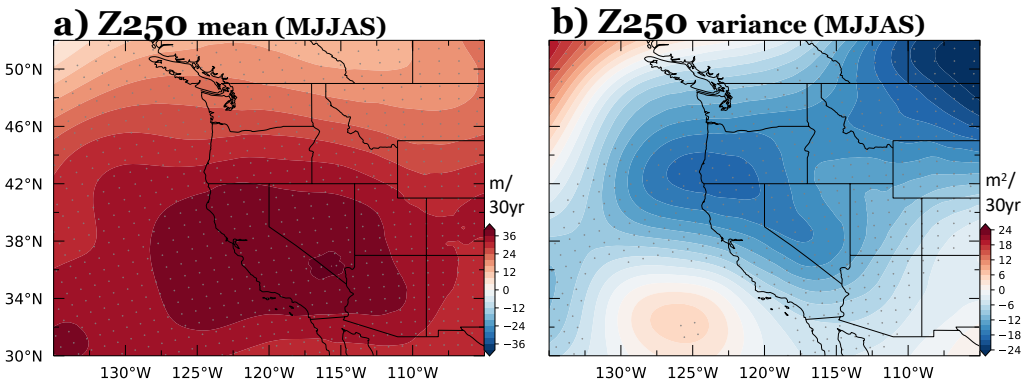


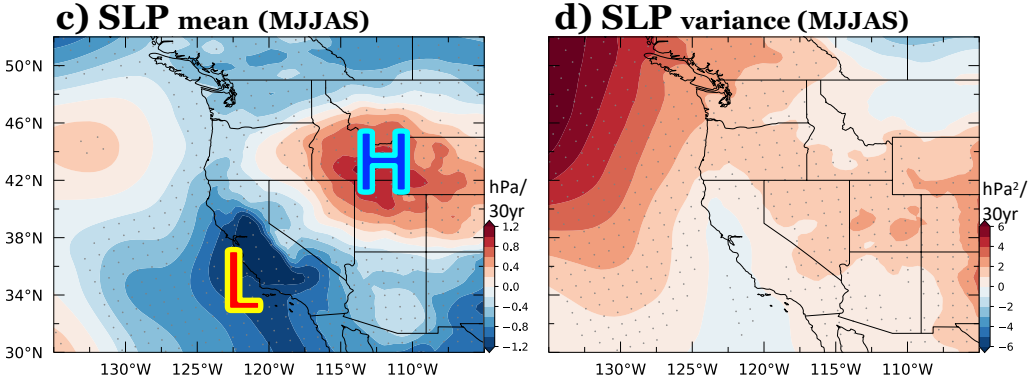


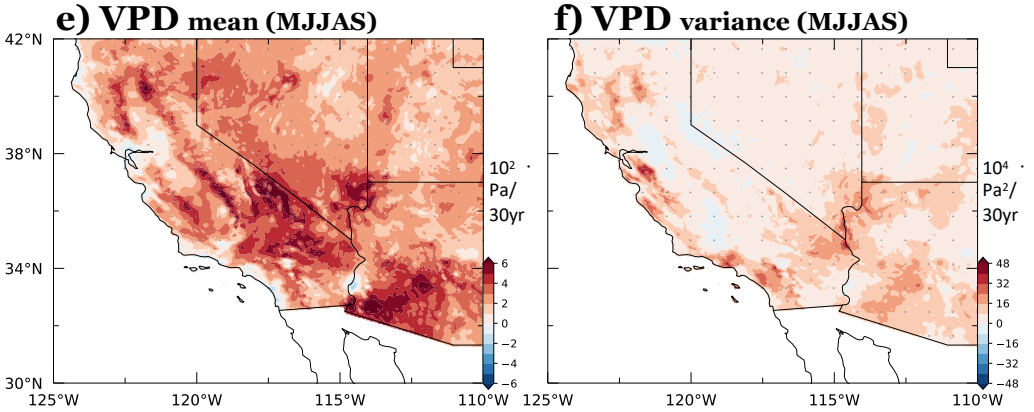


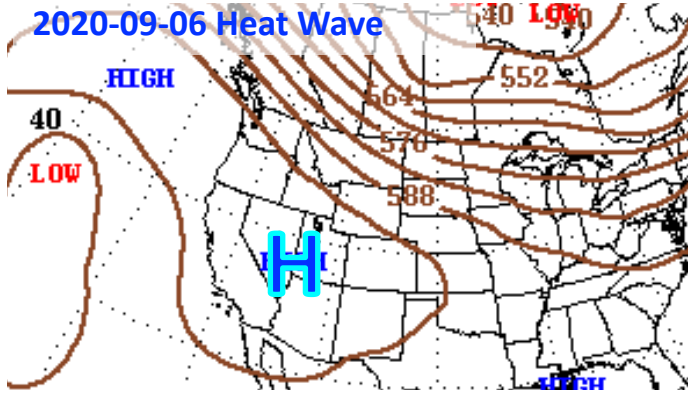
- Extreme dry condition in wildfire day => average burned area in South Coast.
- How are the long-term circulation changes associated with the recent increase in average wildfire size?

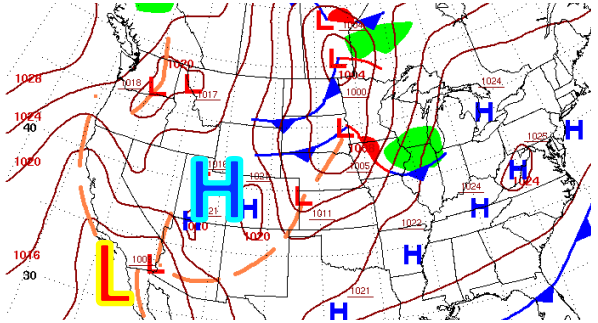
Long-term Circulation changes in May-September







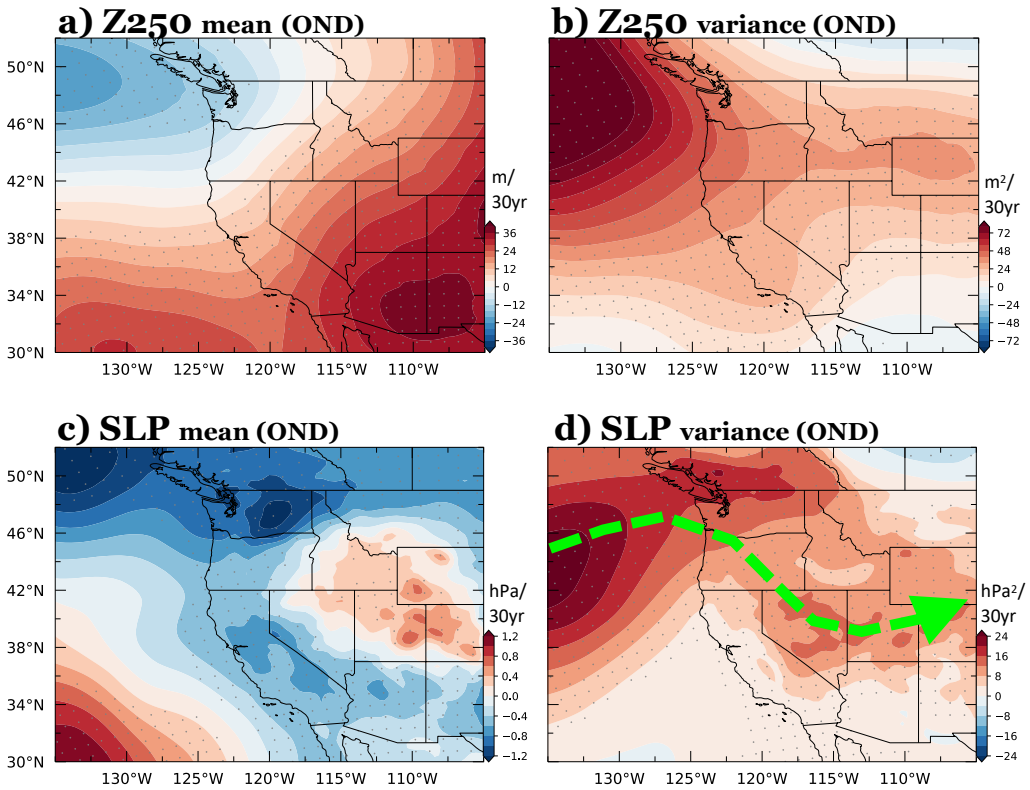


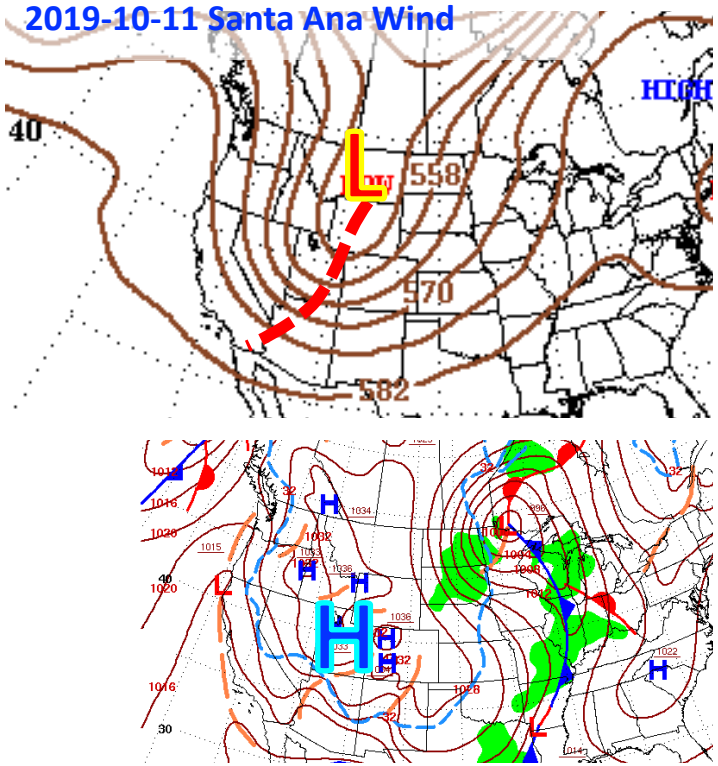


- Stable heat wave anomalous + southward extension of SLP variance => higher risks of drier and hot events.

- CMIP6 can simulate the changes of VPD but cannot well simulate these multi-year circulation changes.

Long-term Circulation changes in October-December





- High variances of jet stream system+ Equatorward extension of high-pressure anomaly => Drier Santa Ana wind and high risks of large fires

- Challenges/Future direction: understand the multi-year changes of climate internal variability on regional climate and wildfires in GCM (RCM).