



Interannual variability of precipitation over North America and its relationship to sea surface temperatures from GCM and RCM simulations

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An ensemble of future climate projections performed with GCMs and RCMs is used to analyze changes in the relationship between sea surface temperature (SST) and inter-annual variability of precipitation over North America during winter (November to March).

We analyze the influence of the interaction between the El Niño Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO) on the precipitation over Mexico and North America. As in observations, GCM simulations reproduce reasonably well how PDO modulates ENSO teleconnections during the historical period, reproducing strong atmospheric and precipitation responses during constructive ENSO-PDO interference (El Niño and a positive PDO, or La Niña with negative PDO). Conversely, signals tend to be weak during destructive ENSO-PDO interference (El Niño with a negative PDO and La Niña with a positive PDO). An intensification of the PDO signal on SST anomalies in the future (2051-2100) compared to the historical simulations is found in the ensemble of models. Future warmer SST conditions produce a stronger response in precipitation to El Niño and positive PDO, thus, increasing the variability in the regions of North America with teleconnection (mainly over Northern Mexico, California and Southwest USA). This future change on interannual variability is in part due to a more important role of PDO on precipitation over these regions, compared to the historical simulations. RCM simulations generally confirm these conclusions, but the changes are more pronounced in the RCM than the GCM projections.