

ATS/CIRA Colloquium

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101 Hosted by Maria Rugenstein**

**Modulation of ENSO Teleconnections over
North America by Pacific Decadal Variability**

Both the El Niño Southern Oscillation (ENSO) and Pacific Decadal Variability (PDV) influence the climate over North America. For example, both El Niño events and the positive PDV are associated with anomalous cold and wet winter conditions in the south-west United States. Previous work has suggested that ENSO temperature and precipitation teleconnections differ depending on the phase of the PDV. However, these studies are limited by the short observational record. In this study we revisit the role of the PDV in modulating ENSO teleconnections using five large ensembles. The use of large ensembles means that we can composite many events from different combinations of PDV and ENSO phases, allowing a statistically robust comparison of ENSO events that occur during different phases of the PDV. We find that a positive PDV enhances El Niño temperature and precipitation teleconnections and diminishes La Niña teleconnections. A negative PDV has the opposite effect. The modulation of ENSO by the PDV occurs due to differences in the location and strength of the Aleutian low and the Pacific Jet Stream. Additionally, this modulation is a linear combination of the effects of the PDV and ENSO on North America. Finally, we find that ENSO and the PDV can be used to evaluate the likelihood of temperature and precipitation anomalies occurring, but cannot be used to predict these anomalies due to the high variability between individual events. For example, when the PDV is positive the probability of warm anomalies is increased during El Niño events over Alaska and offshore of the western United States coastline where marine heatwaves occur. In contrast, the probability of precipitation occurring during an El Niño over both San Diego and the Colorado river basin is unchanged by the PDV.

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