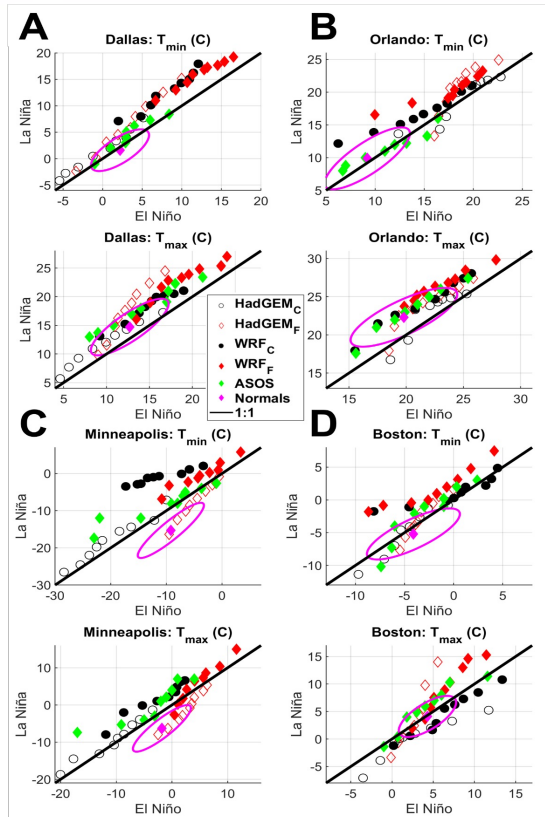


ENSO-induced anomalies over North America in historical and future climate simulations



Empirical quantile-quantile plot of January T_{min} and T_{max} as a function of ENSO phase from HadGEM2 and HadGEM2-WRF for; (A) Dallas, (B) Orlando, (C) Minneapolis, and (D) Boston. Black circles = historical climate and red diamonds = future (open symbols = HadGEM2, solid = HadGEM2-WRF). ASOS obs. = green, NOAA Climate Normals = magenta.

Shepherd T.J., Coburn J., Barthelmie R.J. and Pryor S.C. (2022): Exploring ENSO-induced anomalies over North America in Historical and Future Climate Simulations that use HadGEM2-ESM output to drive WRF. *Climate* **10** 117 doi: 10.3390/cli10080117

Scientific Achievement

Regional expressions of ENSO phase as temperature and precipitation anomalies are explored using direct ESM output and downscaled at convection-permitting scales with WRF. Simulations for the contemporary climate differ from those in the NOAA ENSO Climate Normals dataset due to large biases in HadGEM2. Downscaling with WRF improves agreement with observations.

Significance and Impact

ENSO is the primary internal mode of climate variability and is the source of large magnitude near-surface climate anomalies worldwide. Our work suggests a reversal in the sign of the ENSO phase response over eastern North America under simulations of the future climate with high greenhouse gas forcing.

Research Details

Two paired simulations are run: a strong El Niño (positive ENSO phase) and a weak La Niña (negative ENSO phase) for the historical and future years.