

ENSO Diversity in the US National Multi-Model Ensemble (NMME) Prediction System

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Canonical El Niño events are characterized by anomalous warming in the eastern equatorial Pacific Ocean. Recent studies, however, suggest that the canonical El Niño has become less frequent and that a different kind of El Niño has become more prevalent during that last few decades. This second type of El Niño is characterized by warm sea surface temperatures (SSTs) in the central Pacific that are flanked on the east and west by cooler SSTs. This type of El Niño, termed the central Pacific El Niño (CP-El Niño; also termed the dateline El Niño, El Niño Modoki or warm pool El Niño), differs from the canonical eastern Pacific El Niño (EP-El Niño) in both the location of maximum SST anomalies and tropical–midlatitude teleconnections. Despite these recent studies it is not clear whether there is a clear dichotomy between eastern vs. central Pacific warming events, or whether the location of maximum warming ranges over a continuum of longitudes.

This talk examines the question of the diversity El Niño events in the NMME retrospective forecasts in comparison to observational estimates. The NMME forecasts include seven different state-of-the-art prediction systems that are initialized each month of each year for 1982-present. Each modeling system has a range of ensemble members (between 6 and 24) yielding 89 ensemble members for each forecast. This large ensemble size allows examining the longitude of SST maximum from a probabilistic perspective. For the analysis each prediction system is bias corrected and calibrated. The forecast for longitude of SST maximum is compared to observational estimate using both probabilistic and deterministic measures of forecast skill.