

Seasonality of interbasin SST contributions on Atlantic tropical cyclone activity

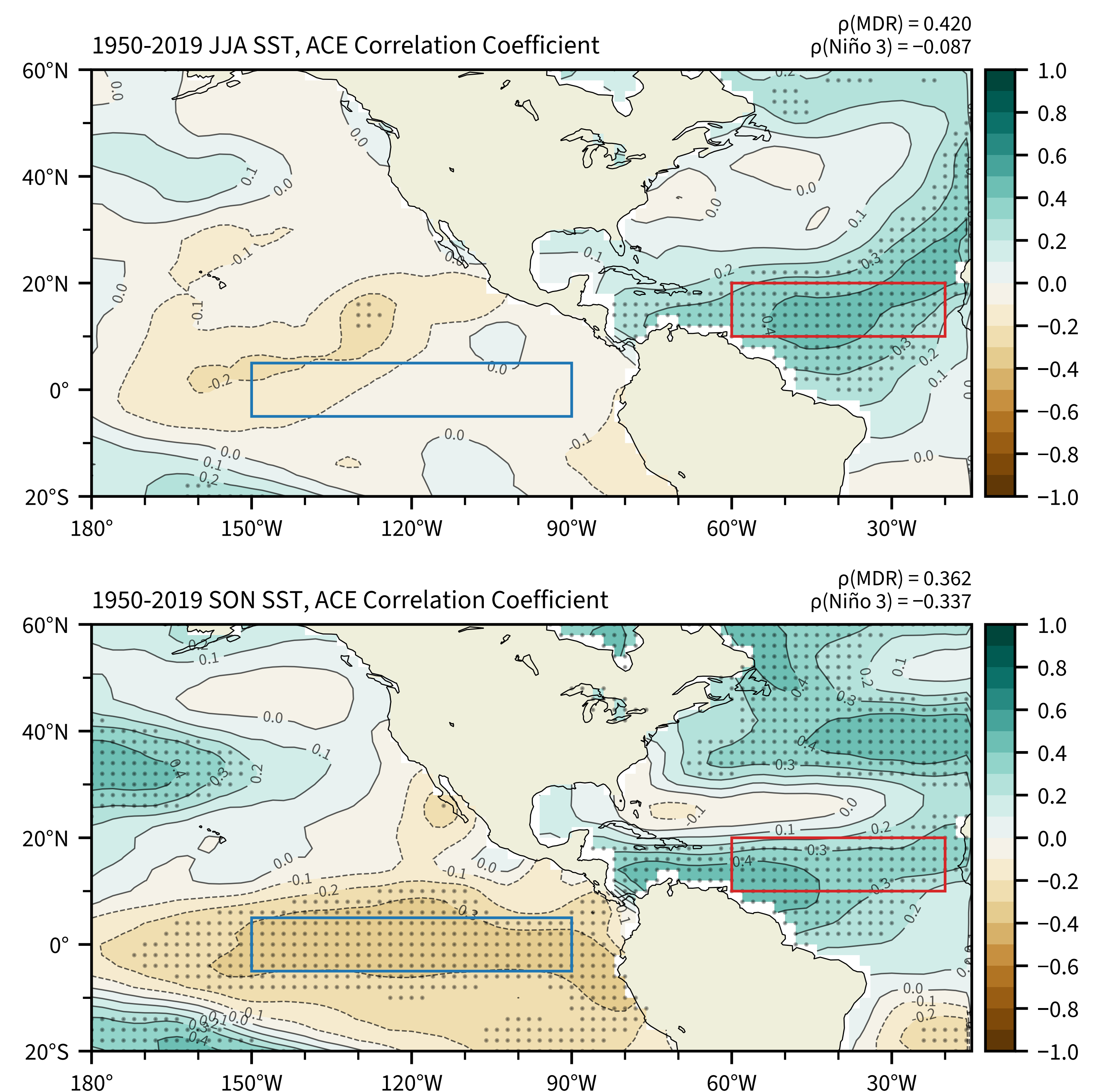
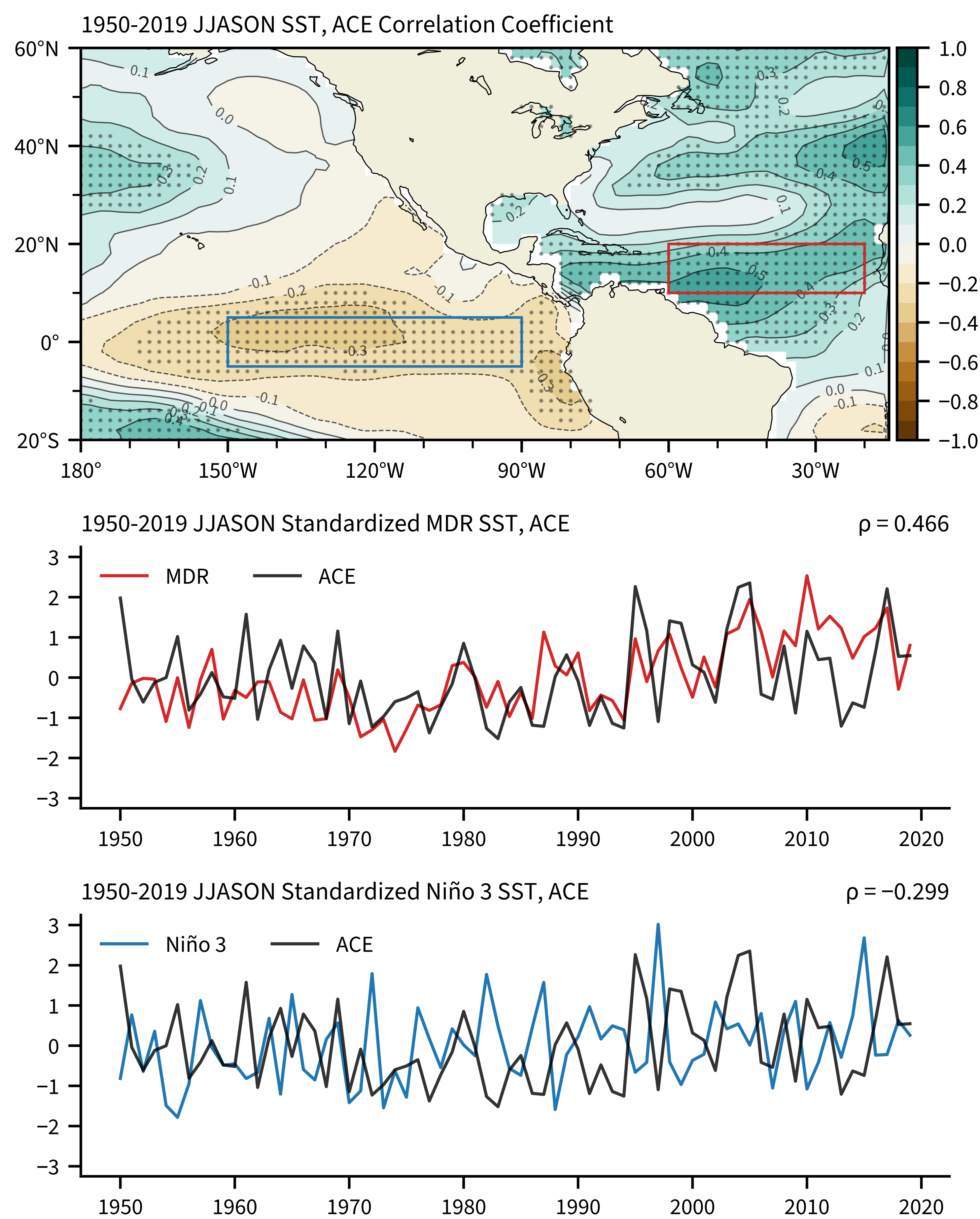
Robert West^{1,2}, Hosmay Lopez², Sang-Ki Lee², and Andrew E. Mercer^{1,3}

¹ Northern Gulf Institute, Mississippi State University, Mississippi State, MS USA
² Atlantic Oceanographic and Meteorological Laboratory, NOAA, Miami, FL USA
³ Department of Geosciences, Mississippi State University, Mississippi State, MS USA

The relative difference between main development region (MDR, local) and tropical Indo-Pacific (remote) SSTs impacts Atlantic TC activity via atmospheric teleconnections: convective instability from warm remote SSTs influences vertical wind shear and subsidence in the tropical Atlantic.

Any seasonality found in the interbasin SST relationship is important for predicting early and late season TC activity, represented here by accumulated cyclone energy (ACE).

Relative contributions of MDR, Niño 3 SSTs to Atlantic TC activity are seasonal: local SSTs dominate the early hurricane season (JJA), but influence shifts to remote SSTs in the late season (SON).



JJA: No significant Niño 3 SST, ACE correlation. MDR has local maximum positive correlation. Local SSTs are the dominant influence in early hurricane season.

SON: Strong anticorrelation in Niño 3. Region of maximum positive correlation west of MDR. Local and remote SSTs have similar magnitude of late season impact.

Data: NOAA Extended Reconstructed Sea Surface Temperature (ERSST) dataset, Version 5, doi:10.7289/V5T72FNM. NHC Hurricane Database (HURDAT 2), doi:10.1175/MWR-D-12-00254.1. North American Multi-Model Ensemble (NMME), NCAR Community Earth System Model (CESM1) monthly hindcast, doi:10.1175/BAMS-D-12-00050.1.

Seasonal predictability?

Next: Assess the seasonal predictability of TC activity by constructing an MDR, Niño 3 SST index and evaluating skill using an ensemble of monthly forecasts.

Observations (ERSSTv5) show Niño 3 monthly variance is consistent with ENSO phase locking to the seasonal cycle.

Are monthly forecast ensembles able to reliably reproduce the variance observed in the MDR and Niño 3?

