

SESSION: (B1) Mechanisms of S2D predictability

(B1-14)

ENSO: towards breaching the springtime predictability barrier

Webster, Peter (1), Toma, Violeta (2), Johnstone, James (3), Hirata, Fernando (4), Curry, Judith (5)

Climate Forecast Applications Network (1) (2) (3) (4) (5), Georgia Institute of Technology (1), (2)

The springtime predictability barrier in ENSO predictions (ref Webster Song) arises from stochastic processes occurring in the tropical Pacific that are tied to the annual cycle. As a result, forecast initialized prior to May (and in some years, as late as July) have shown little skill in ENSO prediction from late summer to the end of the year. Recent advances in global seasonal forecast models appear to be breaching the predictability barrier to some extent. We assess the ENSO hindcast skill of the latest version of the ECMWF Seasonal Forecasting System (SEAS5), relative to the previous version (SEAS4). Extended predictability of Niño 3.4 from SEAS5 shows correlation coefficients 0.7 for all initialization months (including spring) for forecasts 5-6 months in advance. We have conducted a climate dynamics analysis seeking to identify the sources of this extended range ENSO predictability. We have identified DJF precursor signals in upper tropospheric and stratospheric anomalies at high latitudes of both hemispheres, consistent with research showing important extratropical forcing of surface wind anomalies and SST responses in the equatorial and off-equatorial Pacific. We have updated the analysis of ENSO – precipitation relationships in the U.S. by analyzing shifts in the statistical distribution of rainfall during warm (El Niño) and cold (La Niña) phases of the Southern Oscillation for the period 1981-2016. An evaluation is presented of the skill of ECMWF SEAS5 in predicting U.S precipitation anomalies associated with ENSO.