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Seamless Coupled Prediction System (SCoPS): Assessment of the APCC In-house Model Real-Time Seasonal Forecast

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ABSTRACT

Asia-Pacific economic cooperation Climate Center (APCC) has made great efforts to develop and improve a seasonal forecast model to provide more reliable forecast information for the Asia-Pacific regions. Recently, as a result of the efforts, the APCC has launched a new dynamical seasonal forecast system, Seamless Coupled Prediction System (SCoPS). The newly developed SCoPS model is state-of-the-art global prediction system based on the fully-coupled atmosphere, land, ocean, and sea-ice model has been operationally implemented and participated in the APCC Multi Model Ensemble (MME) prediction since November 2017. This study focused on the skill assessment of SCoPS seasonal forecasts for sea surface temperature (SST), temperature, precipitation, and circulation fields on a monthly basis compared to that of Community Climate System Model version 3 (CCSM3) which is previous version of APCC in-house model in past years. Relative performances of SCoPS and participating models in the APCC MME prediction (*e.g.*, National Centers for Environmental Prediction (NCEP) Climate Forecast System, Predictive Ocean Atmosphere Model for Australia (POAMA), and Meteorological Service of Canada (MSC) Coupled Climate Model) are also discussed. Results indicate that SCoPS consistently better performance than CCSM3 in anomaly pattern correlation and temporal correlation skills for the spatial distribution of SST and Nino 3.4 index predictions (Fig.1). Similar results can also be found in temperature and precipitation that the real-time forecast skill of SCoPS generally outperforms that of CCSM3 for the whole period in both global and regional scales. Further, SCoPS is more skillful than CCSM3 in predicting the seasonal climate variability, including the ENSO, East Asian summer and winter monsoon.

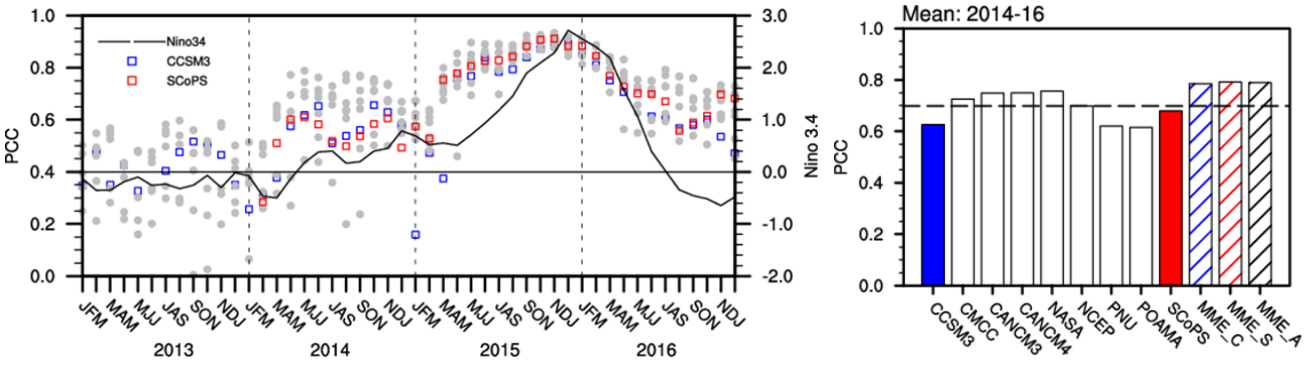

Fig. 1 Pattern correlation coefficient (PCC) of the SST anomalies between observation and APCC MME participant models over the tropical (20˚N-20˚S). Left panel shows the observed (black line) Nino3.4 index and PCC of SCoPS (red square) and CCSM3 (blue square) for strong El Nino events (2015-2016). Right panel shows PCC skill of participant models and MME

Reference

Ham, S., A-Y. Lim, S. Kang, H. Jeong, and Y. Jeong, 2018: A newly developed APCC SCoPS and its prediction of East Asia seasonal climate variability. *Clim. Dyn.*, doi:10.1007/s00382-018-4516-5

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