

# Seamless coupled Prediction System (SCoPS): Assessment of the APCC model retrospective seasonal forecast (1982-2013)

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This study evaluated and compared the basic performance of the seasonal prediction using an ensemble hindcast runs for 32 years (1982-2013) produced by APCC in-house CCSM3 and SCoPS seasonal prediction systems. The APCC CCSM3 is global prediction system for seasonal time scale, based on the fully-coupled atmosphere, land, ocean, and sea-ice model, with sea surface temperature data nudging. Each ensemble hindcast run with 10 member ensembles was initialized from GODAS data for SST. Newly developed APCC SCoPS is state-of-the-art global prediction system for sub-seasonal to seasonal time scale, based on the fully-coupled atmosphere, land, ocean, and sea-ice model, with comprehensive initialization processes of atmosphere and ocean. Initialized data for 10 member ensembles is assimilated by Ensemble Kalman Filter methods using NCEP CFS reanalysis data and ocean sub-surface profile data.

To examine the fidelity of the system to reproduce and to forecast phenomena, this study focused on three important aspects: systematic biases of hindcast climatology, interannual variability of large-scale circulation, and prediction skill of major climate variability. The first one includes the evaluation and the identification of the systematic biases in the global prediction model, judged from long-term averaged states with many ensembles. The second one shows the global divergent field at the upper troposphere in contributions from the Hadley, Walker and monsoon circulations, using a seasonal mean velocity potential field. The third one focuses on the prediction skill of ENSO, East Asian summer and winter monsoon, AO, which are major drivers of weather and climate variability in East Asia.