



The effect of dynamical downscaling with GCM bias corrections on simulated climate over East Asia

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Uncertainties in climate prediction come from multiple sources including incomplete model formulations. Model errors are probably the most viable to characterize, and potentially remedy to reduce the uncertainty. The common approach for RCM simulation employs initial condition, lateral boundary condition, sea surface temperature, and initial land surface conditions from GCM data. Both GCM and RCM simulations suffer from model biases that eventually lead to significant errors in regional forecast. This model bias issue is addressed using the bias correction approach.

This study examines the influence of bias correction on the performance of downscaling simulation for East Asia using the Global/Regional Integrated Model system (GRIMs). The GRIMs is forced by the Climate Forecast System (CFS) seasonal prediction data for 20 years from 1988 to 2007. The bias correction is applied to wind speed, temperature, geopotential height, specific humidity, and sea surface temperature of the CFS data.

This dynamically downscaled forecast is compared with the CFS produced by global forecast model. Results of the comparison suggest that the regional climate model (RCM) adds value in seasonal prediction application, but the improvements largely depend on location, forecast lead time, variables, and skill metrics used for evaluation.