



## **Recent Climate Simulation over Bangladesh using High Resolution AGCM**

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A study of recent climate simulation during the period 1979-2006 is carried out over Bangladesh with Meteorological Research Institute (MRI) global 20 km mesh Atmospheric General Circulation Model (AGCM), called MRI-AGCM. Skills of the model in simulating rainfall and temperature as well as frequency and intensity of extreme events are investigated at various temporal and spatial scales with a focus on mean surface air temperature and rainfall over Bangladesh. Initial and lateral boundary conditions are provided based on the IPCC SRES A1B scenario during the period 1979-2006. The MRI-AGCM shows good performance in simulating meteorological parameters such as rainfall and temperature and exhibits seasonal and inter-annual variations over the South Asian Association for Regional Cooperation (SAARC) region including Bangladesh with some persistent biases being present in summer monsoon rainfall. The model successfully simulates temperature over this region with a systematic cold bias due to the East-West temperature gradient. Simulated mean surface air temperature is compared with NCEP/NCAR reanalysis and CRU mean surface air temperature during the period 1979-2006 (28 years) for summer and winter seasons. Outputs from the MRI-AGCM show some fine scale structures that are missed by the NCEP/NCAR reanalysis products due to its coarse resolution. In general, the MRI-AGCM show a predominant cold bias of a few degrees (greater in summer than in winter) throughout the SAARC domain, the MRI-AGCM simulated rainfall shows good agreement with that of CRU and considerable discrepancies are found both with GPCP and NCEP rainfall fields in the summer monsoon season. However, model simulated rainfall is relatively in good agreement with NCEP than GPCP. The statistical analysis such as correlation, bias and RMSE are derived between model and all observed data including station data, CRU, NCEP/NCAR and GPCP. Spatial and temporal patterns of summer monsoon rainfall of MRI-AGCM show almost similar pattern with different magnitudes. The high resolution MRI-AGCM rainfall is quantitatively in good agreement with GPCP, NCEP and CRU rainfall.