

Seasonal prediction of the Indian summer monsoon precipitation using global climate models

Sarat C. Kar and A.K. Bohra

National Centre for Medium Range Weather Forecasting

Government of India

A-50, Sector 62, NOIDA, UP, India

(sckar@ncmrwf.gov.in)

Accurate prediction of precipitation anomalies over India during the Indian summer monsoon season is very crucial for agricultural farming. In the past, frequent occurrences of flood and drought have severely affected the economy in the Indian subcontinent. Several researchers have attempted to properly simulate the interannual variability of the monsoon precipitation, but they have got limited success. Recently, seasonal prediction activity has been initiated at NCMRWF to meet the demands of the user community, and to provide input for climate risk management. Hindcast simulations (1982-2005) have been carried out using four global climate models with observed and predicted SST. The models have different horizontal and vertical resolutions, and also different physical parameterization schemes. One of the climate model has very high horizontal resolution (T170). Using these model simulations, role of SST variations in Pacific Ocean and the Indian Ocean have been examined on the interannual variability of the Indian monsoon rainfall. It was found that some models do not respond to Indian Ocean SST variability in a realistic manner and the ENSO effects are very strong. Mechanisms on how the Indian Ocean (especially the Indian Ocean dipole) modulates the monsoon precipitation over India and East Asia have been examined using observed NCEP-II reanalysis data. Capabilities of the climate models in simulating these mechanisms have been examined from the model simulations. Spread skill relationship has been evaluated using ensemble simulations of each member model. A multi-model ensemble (MME) prediction system has been developed for seasonal time scales. Results of these simulations along with results of several improvements in the model to correctly simulate the monsoon precipitation will be presented in the Conference.