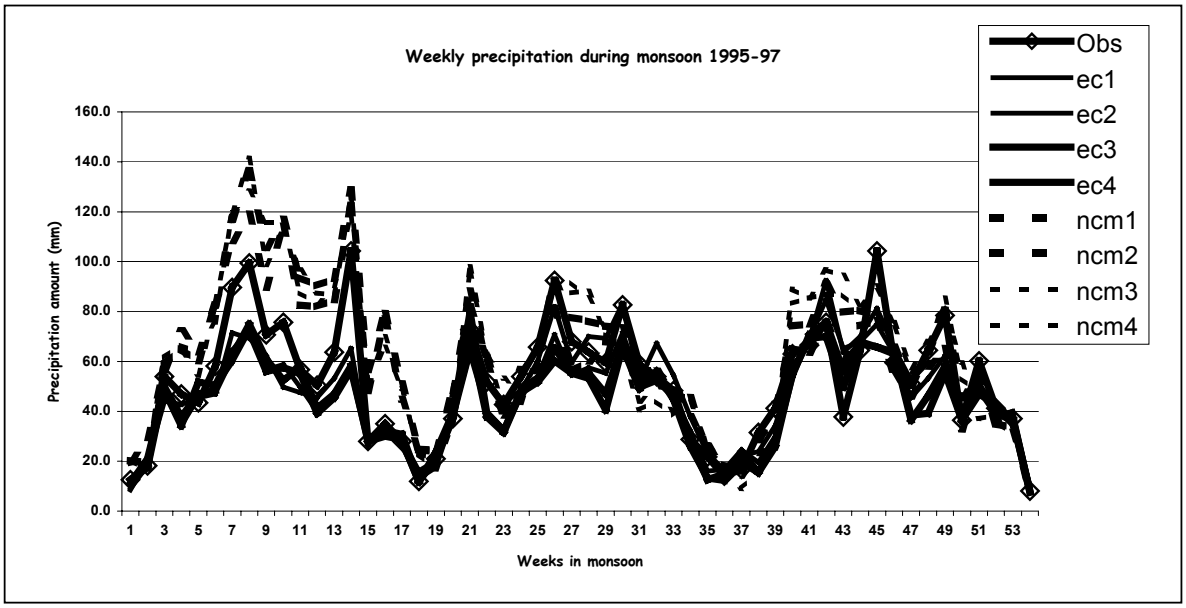
Summer Monsoon precipitation over India – a comparison of model predicted and observed values.

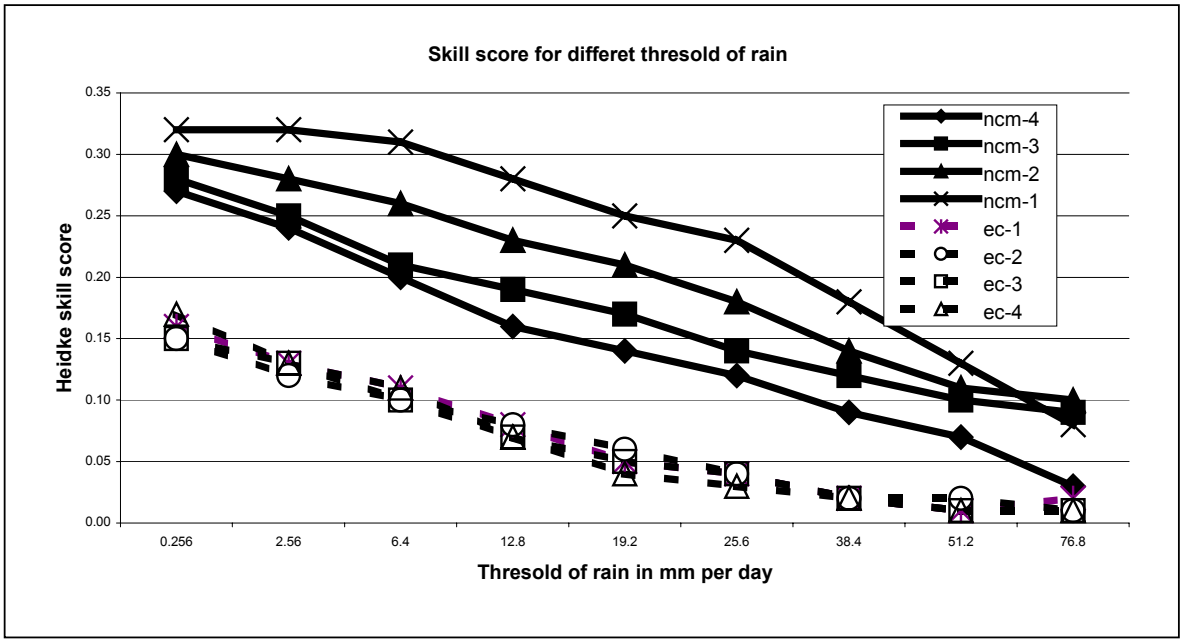
B.K.Basu
NCMRWF,
Lodi Road,
New Delhi –110 003
India.

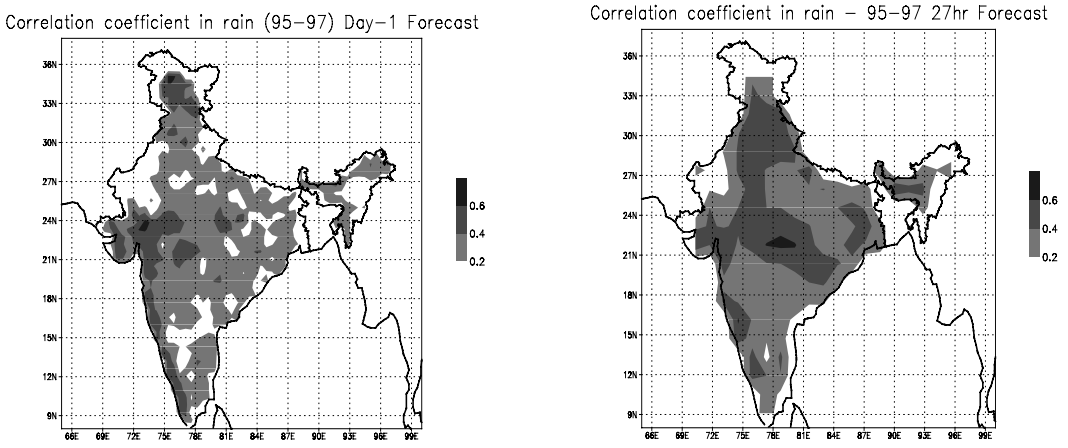
The precipitation forecasts over India from the ECMWF (T213) and the NCMRWF (T80) models for the monsoon seasons (1st June to 30th September) of 1995, 1996 and 1997 were compared with the observed rain gauge values. For quantitative comparison the observed values were averaged over the grid box areas representative of each grid point of the respective models. The spatial averaging is done by the Thiessen polygon method that assigns each elementary area to the rain gauge nearest to it and the weight of each rain gauge is the fractional area assigned to it.

The NCMRWF model forecasts have 10 to 15% more rainy days, mostly in the light or moderate precipitation categories, compared to the spatial average of observed values. Seasonal accumulated values of all India average precipitation show a slight spin up with forecast length for the NCMRWF model and a small spin down for the ECMWF model. The weekly-accumulated values of forecast precipitation from both models, averaged over the whole of India, are in phase with forecasts of length up to day-4.

Values of statistical parameters based on the frequency of occurrences in various classes indicate that the NCMRWF model has some skill in predicting precipitation over India during the summer monsoon. In spite of its low resolution, the NCMRWF model forecasts have higher trend correlation with the observed precipitation than the ECMWF model forecasts. This is due to the maximisation of data utilisation in the neighbourhood of India in the NCMRWF model. The mean errors across west coast is much reduced in the ECMWF model forecasts due to better representation of the mountain ridge line along coast. This indicates that a large part of the systematic error in the NCMRWF model is due to poor representation of the coastal topography and this will be removed with implementation of higher resolution. Both models have a tendency of over predicting the occurrences of light to moderate precipitation events and under predicting the events in heavier categories.







Correlation coefficient for day-1 forecasts of ECMWF model (left) and NCMRWF model (right).