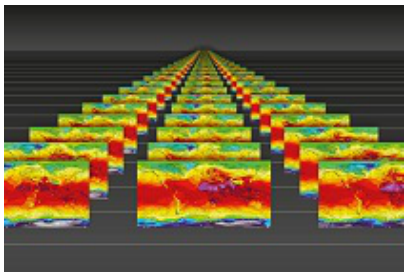

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Short to medium range forecasting skills of the GFS model

This study analyzes the error characteristics of the Global Forecast System T574L64 (GFS) model over the South Asian region during the boreal summer season of 2012. We demonstrate that growth of forecast error with lead time behaves differently over land and ocean. Even though the magnitude of error is larger over land, error grows faster with lead time over the ocean. The increase in error over the ocean is due to an increase in the number of grids with high errors (upper 5 percentile). Such an increase is limited over land. Interestingly, the number of grids having a low error (lower 5 percentile) does not change much over both land and ocean. The model shows poor forecasting skills in predicting very heavy precipitation over the entire domain. On daily and diurnal timescales, more than 90% of the total error over both land and ocean is because of the model inadequacy to capture the correct phase of the precipitation. On a daily scale, although the model captured the transition of the occurrence of active and break phases over the monsoon zone, it still has considerable difficulties in forecasting long intense break and heavy rainfall events. Moreover, the model overpredicts the intensity of the break phase. The large error over land on a daily scale is due to the error in 18 and 24 GMT forecasts. The diurnal cycle of precipitation in the model shows a phase shift in precipitation maxima of about 6 hours over land and a systematic bias over most of the oceanic regions. These phase shift and biases in the forecasted precipitation results in large error over both land and ocean. This understanding of the model performance will eventually direct us towards its improvement.

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Track Classification: Workshop on Predictability, dynamics and applications research using the TIGGE and S2S ensembles