B06

A Down-Scale Experiment on Numerical Weather Prediction in Indochina Region (Lao PDR)

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The main objective of this paper is to evaluate a performance of a Down-Scale Experiment on Numerical Weather Prediction in Indochina Region with a Meso-scale Model during the wet southwest monsoon period.

We performed a downscaling hindcast experiment in Indochina region (Lao PDR) with a fine-mesh meso-scale regional model under the assumption of the "perfect forecast" produced by global numerical weather prediction model, by using the Fifth-Generation NCAR/Penn State meso-scale model (MM5), which is a non-hydrostatic regional model nested to a global dataset. The model domain covers the Indochina Region including the South China Sea (85^{o}E – 125^{o}E in longitudes and Equator – 30^{o}N in latitudes) on a Mercator projection. The computational domain has 230 x 170 grids with the grid distance of about 20 km. The model has set up 23 vertical levels from the surface to 100 hPa with no uniform vertical resolutions. We used a cumulus parameterization scheme "Kain-Fritsch 2"and micro physics "Mixed-Phase" with rain cloud water, ice, and snow. Both longwave and shortwave radiation are calculated, including longwave radiation from clouds. We used NCEP Final Analyses (FNL) for initial and boundary conditions.

The experiment was done for June, July, August and September of the years 2003, 2004, 2005 and 2006 in the wet Southwest Monsoon period. We performed 5-day runs with 1-day overlapping to obtain long term data, discarding initial 1-day of each run. Validations of a downscaling hindcast are done with 17 main surface stations data of temperature and accumulated rainfall in Lao PDR. We obtained an improvement of biases in temperature, possibly due to the well-resolved terrain in the model. Correlation values of daily average surface temperature between model and observation, and FNL and observation are shown in figure (a) for all stations, for each month. This shows that the improvement in correlation is limited.

In future we should do operational real-time forecasts in Indochina region every hour or so for mitigation of disasters by high-impact meso-scale weather of heavy rainfall or tropical cyclones (TC) during the Asian monsoon season.

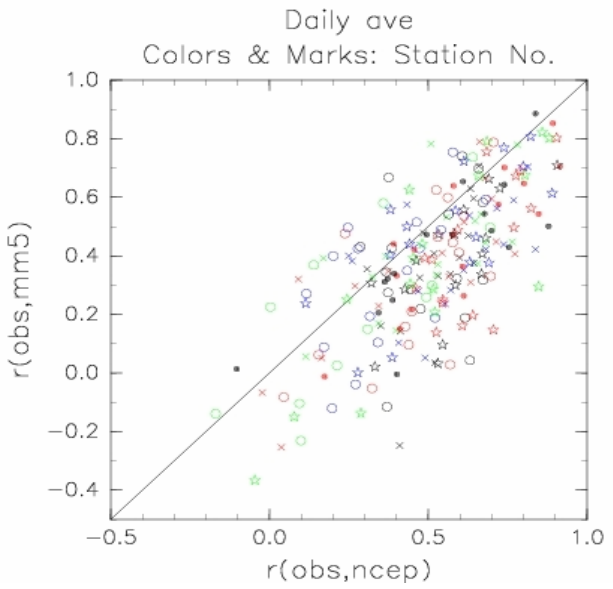

Figure (a): correlation values between observation and NCEP FNL, and observation and MM5 results for all stations, for each month.