

Case studies of downscaling TCs in East Asia using spectrally nudged Regional Climate Models

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Abstract

In this study the feasibility to reconstruct the weather of SE Asia for the last decades using an atmospheric regional climate model was analyzed. Global National Centers for Environmental Prediction - National Center for Atmospheric Research (NCEP-NCAR) reanalysis data were dynamically downscaled to 50 km and in a double-nesting approach to 18 km grid distance using a state-of-the-art regional climate model, the COSMO model in Climate Mode (CCLM).

An ensemble of modeled typhoon events was examined for the typhoon season 2004 for SE Asia and the western Pacific. The simulated typhoon tracks and intensities were compared to Best Track data from the Japan Meteorological Agency. The comparison revealed improved SLP and near-surface wind values by the RCM compared to the reanalysis for most cases. The reanalysis thereby showed smaller great circle distances to the best track data than the regional model. Precipitation patterns and rainfall amounts were simulated more realistically by the RCM using the higher resolution compared to the 50 km run. It is concluded that regional models can improve simulated typhoon developments from global forcing reanalysis data by giving lower core pressure, higher wind speeds and more realistic precipitation patterns even though these values still do not reach observed values.