[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG37]Asian monsoon hydro-climate and water resources research for a next GEWEX RHP

convener:Shinjiro Kanae(School of Environment and Society, Tokyo Institute of Technology)
Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

In the Asian monsoon region, water-related climate is one of the key issues for its growth, sustainability, and disaster prevention. The 10-year MAHASRI (a regional project of GEWEX under WCRP) period successfully finished in 2016, and we are currently trying to establish a new RHP (Regional Hydro-climate Project) for the Asian monsoon region under WCRP/GEWEX/GHP. This session will be open for all fields of research related with Asian monsoon hydro-climate and its application to society (e.g., water resources), regardless of the participation in the above projects. We also welcome GEWEX and GHP related studies outside the Asian monsoon. Keywords and targets of this session include: 1) hydro-climate extremes and water-related disasters in monsoon Asia in a changing climate; 2) prediction of hydro-climate and water resources in monsoon Asia from monthly, seasonal to decadal time-scales for societal benefits, 3) changes in water availability and water use in this particular food basket region of the world, 4) intra-seasonal oscillation and diurnal change of hydro-climate in Asia, and its impact on society, 5) long-term monitoring, data-rescue, satellite remote-sensing, and new observation of hydro-climate and water resources in this region for societal benefits, 6) monsoon onset and withdrawal and their linkages with society. Participants are encouraged to discuss future collaboration and research-network expansion for ultimately establishing the next RHP under GEWEX as a successor of MAHASRI and GAME.

[ACG37-P02]Reproducibility of Indian summer monsoon rainfall in convection permitting Weather Research Forecasting model

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Keywords:Indian summer monsoon rainfall, Regional climate models, explicit convection, parameterization, JRA55 reanalysis, ERA-Interim reanalysis

Dynamical downscaling of Indian summer monsoon rainfall (ISMR) by using regional climate models (RCMs) portrays the inability of the RCMs in simulating the ISMR, and certain systematic biases appear in the seasonal monsoon rainfall climatology. The inconsistency in RCMs simulation of ISMR can be due to the improper representation of convection by convective and/or microphysical parameterization schemes in different RCMs. In this study, we conducted convection permitting simulations in WRFv3.8.1 and compared with parameterized simulations, to understand the difference of reproducibilities of time-space patterns in the ISMR. Our experimental set-up consists of two sets of simulations with parameterized and explicit convection on a grid resolution of 25 km. The simulations are conducted for three different monsoon seasons: flood, drought, and normal years, to ascertain robustness in the analysis of the model output. These simulations are forced by using ERA-Interim reanalysis as the lateral boundary and large-scale forcing input. The mean large-scale circulation, the spatial distribution of rainfall, seasonal northward propagation of rain bands, and magnitude-phase of the Indian summer monsoon rainfall are verified against the JRA55 reanalysis and India Meteorological Department gridded rainfall datasets. The results show that regional simulations with explicit convection have benefited in

the simulation of ISMR features. Simulated seasonal mean rainfall in parameterized convection shows positive bias over Gangetic plains and the Western Ghats. The same bias reduced in explicit simulations and seasonal mean ISMR behaves realistically concerning IMD observations. The added value in the simulation of ISMR in explicit experiments is found to be consistent during the flood, drought, and normal monsoon seasons. Further evaluation of the results reveals that over Indian region, explicit convection simulations of Indian summer monsoon are more realistic than parameterized convection simulations. Therefore, the current study tried to show up the uncertainties in ISMR simulation associated with parameterizations, and explicit convection experiments highlight the reduction of these uncertainties.