[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-AS Atmospheric Sciences, Meteorology & Atmospheric Environment

[A-AS05]Precipitation Extreme

convener:Akiyo Yatagai(Hirosaki University)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Predicting future hydro-meteorological conditions due to human-induced climate change is a major concern. In particular, the change of extreme events are focused by the international scientific and political frameworks, such as WCRP and IPCC. Especially, heavy precipitation often induces disasters such as flood and landslides, and drought is often linked to food crisis. Japanese science community has lead establishment of a dense network of rain-gauge observation such as AMeDAS and developing accurate grid precipitation data over Asia such as APHRODITE as well as high-resolution climate modeling and satellite precipitation estimates. Facing the urgent task of evaluating, forecasting precipitation extremes and mitigating consequence disasters, there seems to be some gaps between the communities. Hence, we propose a session with focusing on extreme precipitation to assemble scientists of tacking this issue with different methods. We also welcome topics on evaluating related meteorological parameters such as snowfall and temperature and studying disasters which are related to extreme precipitation (e.g. typhoon, landslides and drought).

[AAS05-P03]SPATIAL CORRELATION STRUCTURE OF APHRODITE IN DATA SCARCE REGIONS

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Lack of observed gauged data in several parts of India and Pakistan is a key limitation to APHRODITE’s (Asian Precipitation - Highly-Resolved Observational Data Integration Towards Evaluation) daily gridded precipitation dataset. Scarce gauge station data raises a question on the reliability of gridded precipitation product to be used in further research. For this reason, the quality and reliability of the observed gauged as well as the APHRODITE (version V1101 available at 0.25° resolution) was assessed over the data scarce southern coastal region, ‘Gwadar-Ormara’ basin in Pakistan using cross- correlogram. An individual spatial correlogram (correlation coefficient vs. distance) was produced for both in-situ and APHRODITE data to check which dataset shows high correlations for closely located points and smaller values for points at far distances, thus following the Tobler’s first law of Geography (Tobler, 1970). To produce spatial correlograms, daily rainfall values in mm/day from 6 stations namely Pasni, Shadikaur, Tank, Hore, Chibkalamati and Basolmasjid were used for the years 1988-1991. The four-year period was chosen since only in this period daily time series were available without gaps for maximum gauge stations in the study area. Results of the spatial correlation of the two dataset showed that in-situ follows Tobler’s law better than the APHRODITE. The correlogram of in-situ showed structured shape, i.e., with the increase in the distance the correlation coefficient decreases. On the other hand, APHRODITE showed a linear highly correlated graph. Based on this result, it was concluded that APHRODITE can show results far – off from the ground reality due to its processed dataset and may provide unrealistic spatial patterns of precipitation in regions especially with scarce coverage of climate stations compared to the real observed dataset.

Ref: Tobler W. (1970) "A computer movie simulating urban growth in the Detroit region". Economic Geography, 46(Supplement): 234-240.