Hydrol Current Res 2014, 5:4
http://dx.doi.org/10.4172/2157-7587.S1.015

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Hydrology & Meteorology
September 15-16, 2014 Hyderabad International Convention Centre, India

Simulation of a flood producing rainfall event of 9 September 2012 over Jacobabad, Pakistan using WRF-ARW model

M N Ahasan[1] and M A Mannan[1,2]
[1]SAARC Meteorological Research Centre (SMRC), Bangladesh
[2]Bangladesh Meteorological Department (BMD), Bangladesh

Simulation of a flood producing rainfall event of 9 September 2012 over Jacobabad (28.28° N,68.45° E), Pakistan has been carried out using the Advanced Research WRF (ARW) dynamic core of Weather Research and Forecasting (WRF) model (WRF-ARW). On 9 September, 2012, Jacobabad received the heaviest rainfall in last 100 years, and recorded 380 mm in 24 hours, where monthly normal rainfall of September is only 11.2 mm. This was an extraordinary rainfall event and localized over Jacobabad, Pakistan. The WRF model was run with the double nested domains of 27 km and 9 km horizontal resolution using Kain-Fritsch (KF) cumulus parameterization scheme (CPS) having YSU planetary boundary layer (PBL). The model performance was evaluated by examining the different model simulated parameters and some derived parameters. The model derived rainfall was compared with TRMM observed rainfall. The model suggested that this flood producing heavy rainfall event over Jacobabad, Pakistan might be the result of an interaction of active monsoon flow with severe convective activities over the area. The Jacobabad was the meeting point of the southeasterly flow from the Bay of Bengal following monsoon trough and southwesterly flow from the Arabian Sea which helped to transport high magnitude of moisture. The vertical profile of the humidity showed that moisture content was reached up to upper troposphere during their mature stage (monsoon system usually did not extent up to that level) like a narrow vertical column where high amounts of rainfall were recorded. The other favourable conditions were strong vertical wind shear, low level convergence and upper level divergence, strong vorticity field which demarked the area of heavy rainfall. The WRF-ARW model might be able to simulate the flood producing rainfall event over Jacobabad, Pakistan, and associated dynamical and thermodynamical features reasonably well, though there were some spatial and temporal biases in the simulated rainfall pattern.

Biography

M N Ahasan has completed his PhD in Atmospheric Physics from Department of Physics, Jahangirnagar University, Dhaka, Bangladesh. Presently, he is working as a Senior Research Officer (SRO) with SAARC Meteorological Research Centre (SMRC), Dhaka, Bangladesh. He has published more than 20 research papers in national and international reputed journals, and more than 25 research papers in national and international proceeding. He also looks after the computer systems of SMRC as a System Administrator. His fields of interest of research are Monsoon Systems, Heavy Rainfall and Thunderstorms. He also delivers lecture in Physics and Meteorology in some reputed Universities of Bangladesh.

nazmul_smrc@yahoo.com

Urban heat island and indoor comfort effects in social housing dwellings

Eduardo L Kruger
Universidade Tecnologica Federal do Parana, Brazil

Linkages between urban growth and the formation of urban heat islands (UHI) have been proposed by diverse authors and for various climatic regions. In Curitiba (25.5°S), located within a region of subtropical climate in elevation, population has risen from approximately 600,000 inhabitants to 1.5 Million within three decades. In this paper, an analysis of the urban heat island is performed by means of a long-term climate monitoring between December 2011 and February 2013 using a pair of weather stations in and outside the urban area. Resulting effects of the local UHI on thermal comfort conditions in low-cost houses are shown in terms of predicted percentages in cold and heat strain in and outside the urban area.

ekruger@utfpr.edu.br