
Departmental Seminar

Seminar Title	: Evaluating the role of Land Use Land Cover changes in simulating the heavy rainfall using the WRF model: A Case Study of Palakkad and Tirupati
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Venue	: ER-303 Class Room
Date and Time	: 26 Sep 2024 (04:30PM)
Abstract	: The land use and land cover (LULC) plays a crucial role in determining the surface energy budget. The accurate representation of LULC is necessary for accurate prediction. In this study, we have evaluated the impact of LULC change in simulating extreme rainfall events using the Weather Research and Forecasting (WRF) model in southern India. We have chosen extreme rainfall events over Tirupati and Palakkad for evaluating the impact of LULC change. We have simulated each event with updated LULC data from the Indian Space Research Organisation (ISRO;2022) and the default dataset from the United States Geological Survey (USGS;1993) which is available in the WRF model. Analysis reveals that the simulation with ISRO data significantly improved the model's skill compared to the default USGS data. Simulations using ISRO data showed better agreement with the India Meteorological Department and Global Precipitation Measurement datasets in terms of extreme rainfall location and intensity. Analysis shows that thermodynamic fluxes and dynamic parameters are better represented in ISRO-based simulations. These findings emphasize the importance of accurately representing LULCC data in the model. The study demonstrates how recent land surface information can enhance extreme rainfall simulation accuracy, with implications for weather forecasting, climate modeling, and water resource management. This research highlights the need for current and locally relevant land use data in atmospheric models, underscoring the critical role of accurate surface representation in numerical weather prediction. Updating LULCC inputs could significantly improve regional forecasting capabilities in India.