

Application of weather prediction models for hazard mitigation planning: a case study of heavy off-season rains in Senegal

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Abstract Heavy off-season rains in the tropics pose significant natural hazards largely because they are unexpected and the popular infrastructure is ill-prepared. One such event was observed from January 9 to 11, 2002 in Senegal (14.00° N, 14.00° W), West Africa. This tropical country is characterized by a long dry season from November to April or May. During this period, although the rain-bearing monsoonal flow does not reach Senegal, the region can occasionally experience off-season rains. We conducted a numerical simulation of the January 9–11, 2002 heavy off-season rain using the Fifth-Generation NCAR/Pennsylvania State University Mesoscale Model (MM5) and the Weather Research and Forecasting (WRF) model. The objective was to delineate the meteorological set-up that led to the heavy rains and flooding. A secondary objective was to test the model's performance in Senegal using relatively simpler (default) model configurations and local/regional observations. The model simulations for both MM5 and WRF agree satisfactorily

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