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Flow uncertainty from hurricane rain forecasted patterns obtained using a modified multivariable radar tracking technique

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Different cities around Central and North American countries suffer from lack of spatial data as well as from hurricane induced floods. This paper extends a technique to project radar information into neighbor regions where the radar doesn't reach. To be able to use the precipitation patterns obtained from these projections in a flood forecasting system, it is required to know the uncertainty of such patterns. This is even more important when the region is prone to hurricanes. The hurricanes are highly dynamic and complex phenomena that commonly spread its influence in cyclic patterns. This work explores the use of projected spatial patterns of the hurricane Arlene (Category 2) from day 29 to 30 June in the basin of the Santa Catarina River in Mexico. The tracking is done by displacing the precipitation patterns in space using a data driven model (e.g. Neural Netwok). The decay of mass in the projection of hurricane event was calculated with a multivariable mixture of experts' model, using the cumulative change in mass of the whole radar information at previous time steps. A comparative analysis between the statistical distribution from a hydrological model and the built hurricane reconstructed patterns was performed. The HEC-HMS and HEC_RAS model was used for the analysis of the hydrology of the region and the uncertainty associated with the use of each possible projected result. Hourly simulations of the model during june 29th till july 1st were evaluated. The technique presented is very useful to identify possible sensitivity patterns from the hurricane behaviors as well as the most important ranges of flows expected in the hurricane event.