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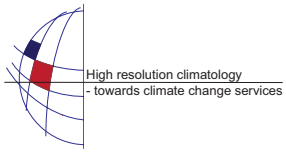

Interpolation of observed rainfall fields for flood forecasting in data poor areas

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Observed rainfall fields constitute a crucial input for operational flood forecasting, providing boundary conditions to hydrological models for prediction of flows and levels in relevant forecast points. Such observed fields are derived through interpolation from available observed data from rain gauges. The reliability of the derived rainfall field depends on the density of the gauge network within the basin, as well as on the variability of the rainfall itself, and the interpolation method. In this paper interpolation methods to estimate rainfall fields under data- poor environments are researched, with the derived rainfall fields being used in operational flood warnings. Methods are applied in a small catchment in Bogotá, Colombia. This catchment has a complex climatology, which is strongly influenced by the inter-tropical convergence zone and orographic enhancement. As is common in such catchments in developing countries, the rainfall gauging network is sparse, while the need for reliable rainfall in flood forecasting is high. The extensive high flood risk zones in the lower areas of the catchment, where urbanization processes are characterized by unplanned occupation of areas close to rivers, is common in developing countries. Results show the sensitivity of interpolated rainfall fields to the interpolation methods chosen, and the importance of the use of indicator variables for improving the spatial distribution of interpolated rainfall. The value of these methods in establishing optimal new gauging sites for augmenting the sparse gauge network is demonstrated.