



A CASE STUDY OF SPATIAL-TEMPORAL RAINFALL DISAGGREGATION AT THE TIBER RIVER BASIN, ITALY

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Daily raingauges, which have been operational worldwide for some decades, offer a large amount of daily data but at the same time the length of available sub-daily series (e.g. hourly) is insufficient for most hydrological purposes. In this case, a disaggregation modelling framework has been proposed to disaggregate the historical data of daily raingauges into hourly series, this generates spatially and temporally consistent hourly rainfall series in several sites simultaneously, using the daily data at these sites and, in addition, any available historical hourly data at neighbouring sites. The disaggregation methodology, which involves the combination of several univariate and multivariate rainfall models operating at different time scales, has been implemented in a user-friendly software called MuDRain. The methodology and software, which were initially developed and applied in the UK, were used in a real world case in the Tiber river basin, Italy. The case study deals with the disaggregation of daily historical data of eight raingauges into hourly series for the period January 1994 - December 1999. The disaggregation was performed using hourly data of three of the raingauges and daily data from all eight. The effectiveness of the methodology was evaluated through tests and comparisons between the simulated series obtained by the disaggregation framework and the historical series available at other three of the eight raingauges. Comparisons showed that the methodology results in good preservation of important statistical properties of the rainfall process such as marginal moments, temporal and spatial correlations and proportions and lengths of dry intervals, and in addition, in a good reproduction of the actual hyetographs.