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

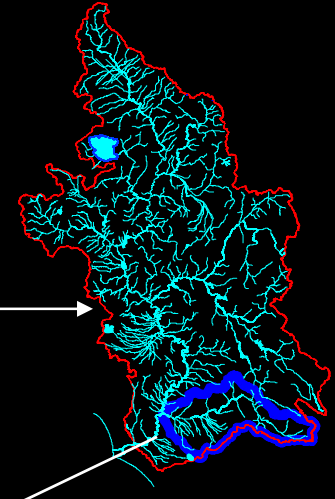*Paola Fytilas[1] , Demetris Koutsoyiannis[2], Francesco Napolitano[1]*

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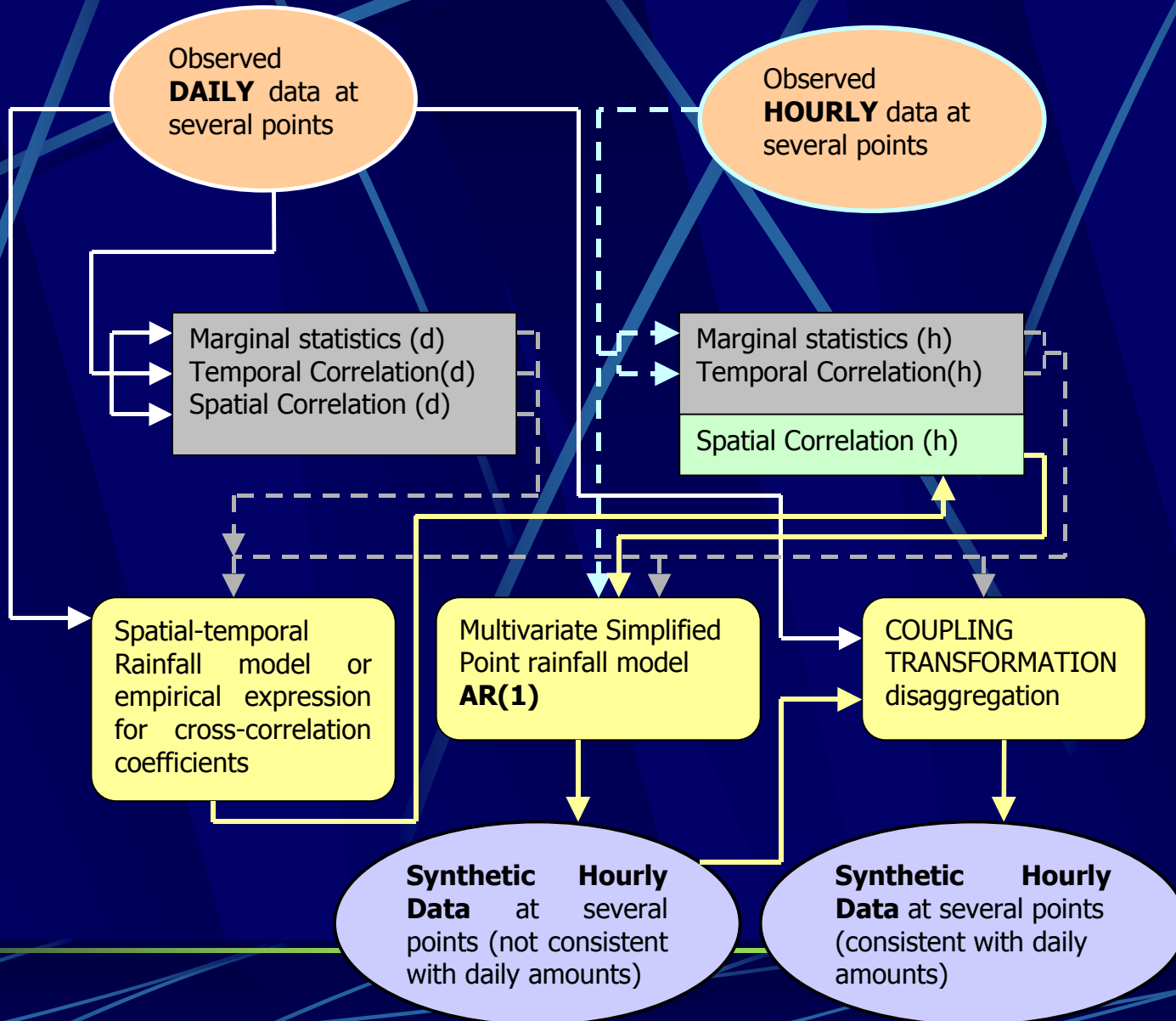
Study Area: **Aniene River Catchment-Tiber River-Central Italy**
Data period:**January 1994-December 1999**

- Raingauges with hourly data used in the generation phase

- Raingauges with hourly data used to evaluate the effectiveness of the methodology

- Raingauges with daily data only

8.ROMA ACQUA ACETOSA

1.TIVOLI

2.LUNGHEZZA

F. Aniene

4.PONTE SALARIO

5.ROMA FLAMINIO

7.PANTANO BORGHESE

F. Aniene

6.ROMA MACAO

3.FRASCATI

The Methodology

Parameter Estimation

Essential statistics to preserve in the generated hourly series :

1. the means, variances and coefficients of skewness;

2. the temporal correlation structure (autocorrelations);

3. the spatial correlation structure (lag zero cross-correlations); and

4. the proportions of dry intervals.

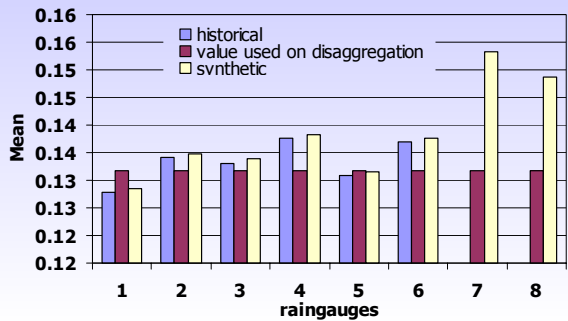**Daily time scale:** estimated directly using the data set available for all raingauges

Hourly time scale: All the statistics, including the cross-correlations coefficients between gages 1,2,3 can be estimated directly from the data set available at these locations.

The unknown cross-correlation coefficients at hourly level were estimated indirectly

using the empirical relationship:

$$\left(r_{ij} \right)_h = \left(r_{ij} \right)_d^m$$

Preservation of marginal statistics
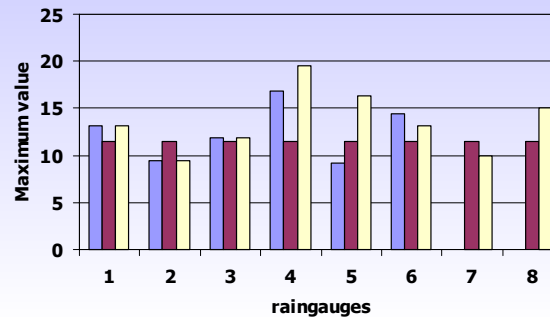
Preservation of cross correlation coefficients
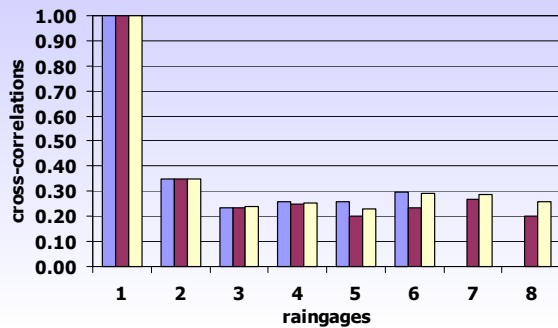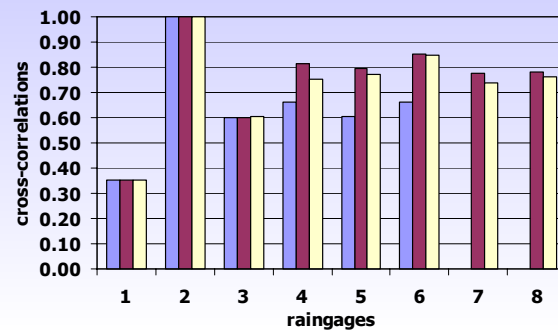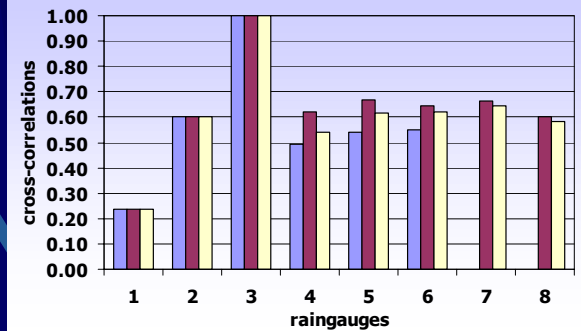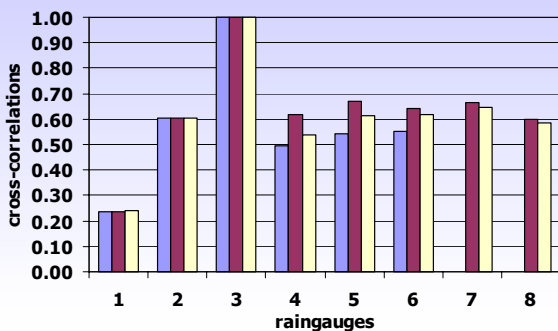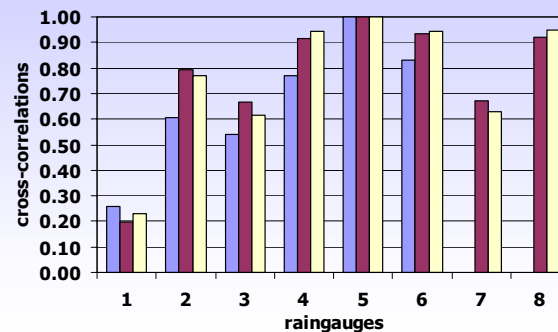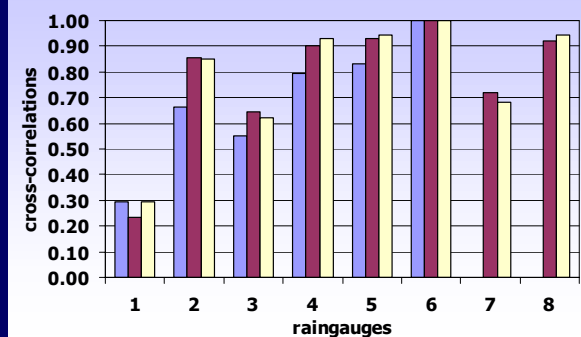
Preservation of autocorrelation coefficients
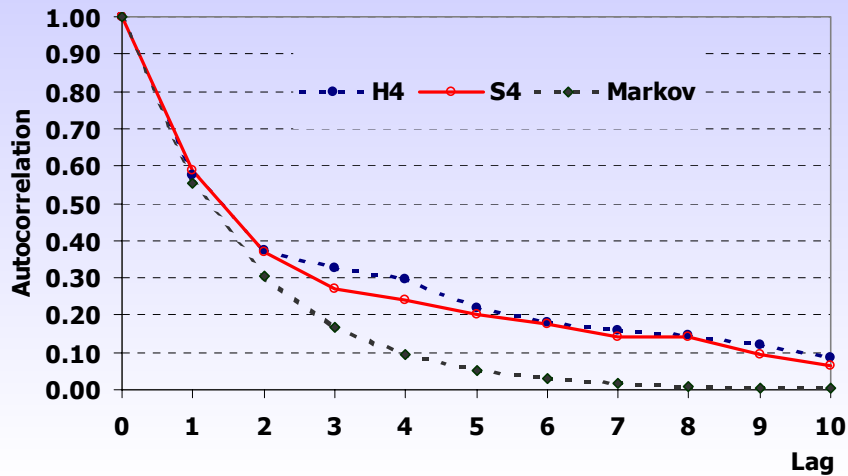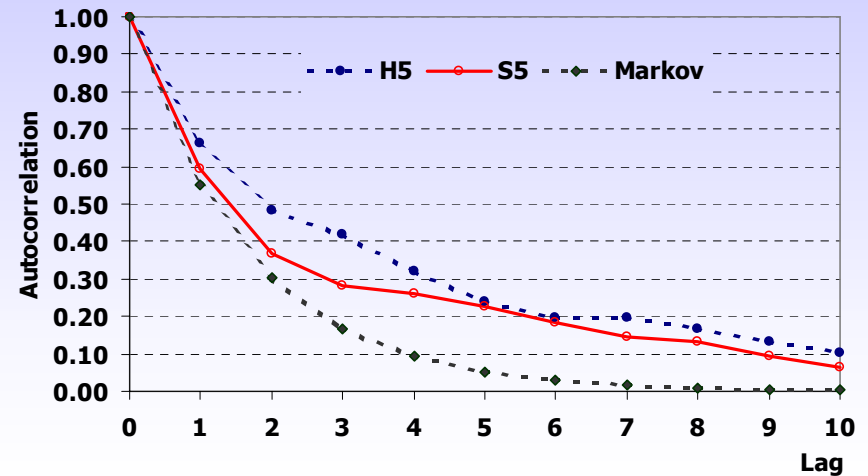
Preservation of probability distribution functions at gauge Ponte Salario
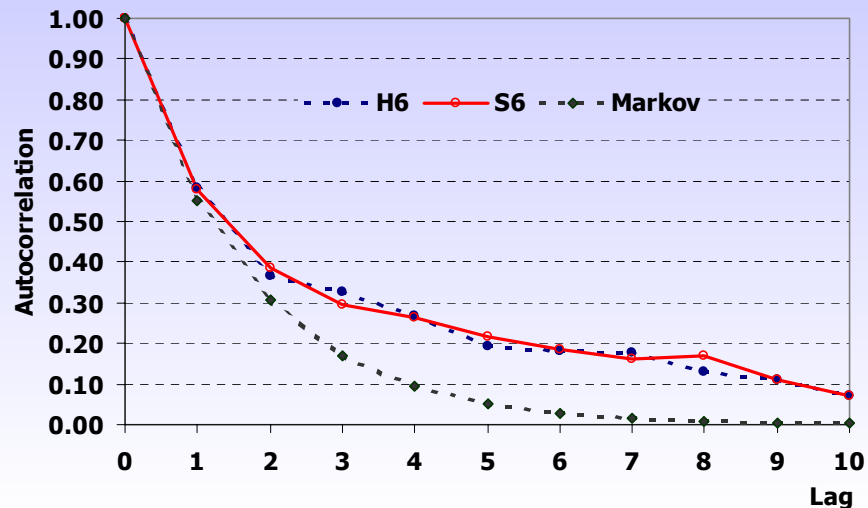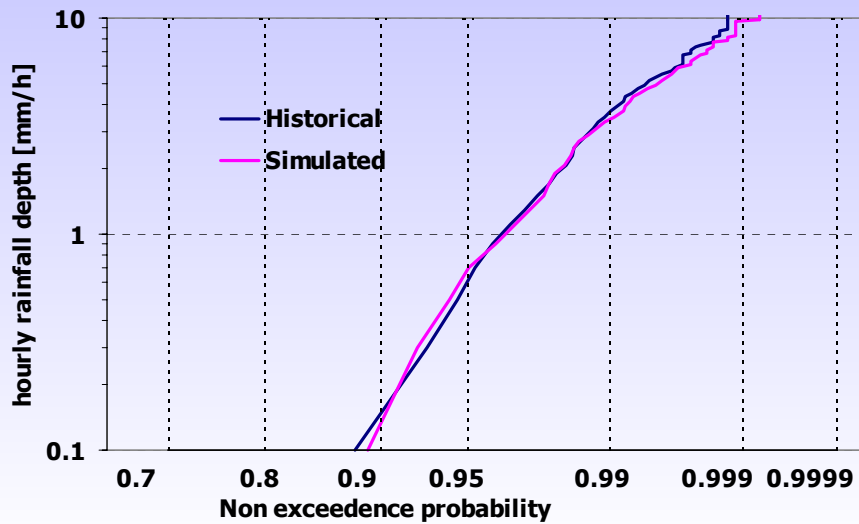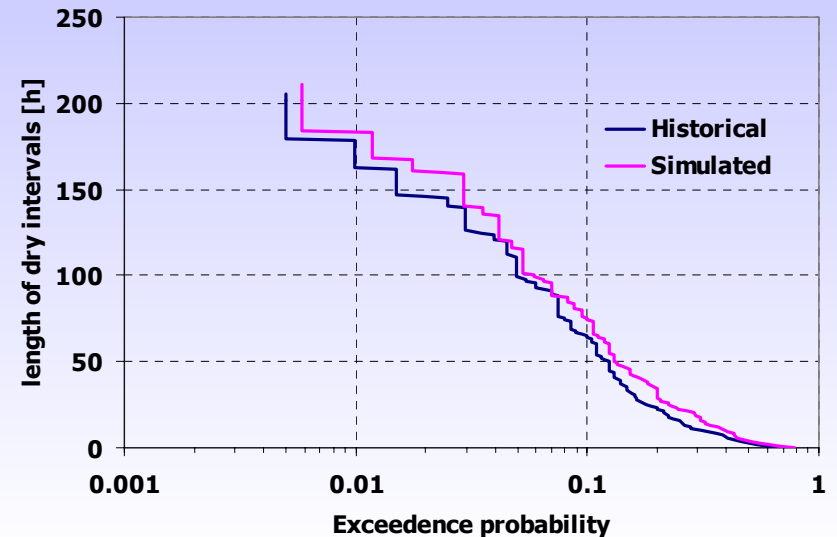
Hourly rainfall depths

Length of dry intervals

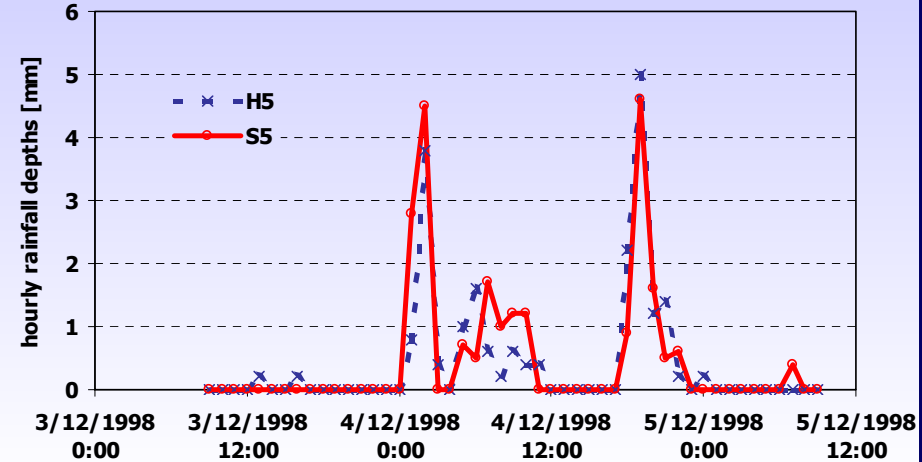# Preservation of historical hyetographs