A synthetic streamflow generator method: coupling the clustering technique with the Markov chain for daily streamflow generation.

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Natural resources, especially water, are stressed because of the ever-increasing population in India. So, there is a need for proper management and planning of water resources which requires meteorological data and streamflow data. The rain and stream gauge data are short and inadequate,1 with substantial gaps and low spatial coverage. Thus, a need to overcome the data shortage is by generating data using Stochastic Weather Generators (SWG). SWG simulate weather variables such as temperature and precipitation based on the historical data and is expected to reproduce the dynamics and dependence structures among the variables of interest and the persistence and the natural variability of weather present in the measured data accurately.

A new non-parametric method is introduced to capture the dynamics of the daily streamflow and to be able to reproduce the statistical moments and correlation accurately. A clustering algorithm called PcStream (Mirsky et al. 2015) is used to perform the variable block resampling in this method. This block resampling simulates the new streamflow realisations. This method can capture the moments daily, monthly and annual scale. This multi-site streamflow generator is able to capture the inter-site correlations well.

References

Mirsky, Y., Shapira, B., Rokach, L., & Elovici, Y. (2015, May) pcStream: A Stream Clustering Algorithm for Dynamically Detecting and Managing Temporal Contexts, *In Pacific-Asia Conference on Knowledge Discovery and Data Mining (pp. 119-133). Springer, Cham.*