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# A computer system for the stochastic disaggregation of monthly into daily hydrological time series as part of a three–level multivariate scheme

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Castalia is a software package (Koutsoyiannis, D., and A. Efstratiadis, A stochastic hydrology framework for the management of multiple reservoir systems, Geophysical Research Abstracts, Vol. 3, European Geophysical Society, 2001) that uses an original two-level multivariate scheme (from annual to monthly time scale) appropriate for preserving the most important statistics of the historical time series and reproducing characteristic peculiarities of hydrological processes such as long-term persistence, periodicity and skewness. A module was developed as an expansion of Castalia, which implements a methodology for the multivariate stochastic simulation and disaggregation of monthly hydrological time series into daily series. This upgraded version of Castalia uses a three-level multivariate scheme that simultaneously preserves the above characteristics for the annual, monthly and daily time scale. Moreover, this module efficiently handles additional difficulties due to peculiarities which frequently appear in daily hydrological series, such as high variation coefficients, high values of skewness and intermittency (preservation of probability dry in rainfall). The computer system was applied for the generation of synthetic hydrological time series within simulation models that are components of a decision support system for hydrosystem management.