



Reservoir yield-reliability relationship and frequency of multi-year droughts for scaling and non-scaling reservoir inflows

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Being a group of undergraduate students attending the course of Stochastic Methods in Water Resources, we study, in cooperation with our tutors, the influence of the scaling behaviour (also known as long-term persistence) of reservoir inflows to the reservoir yield-reliability relationship and to the frequency of multi-year droughts, in comparison to conventional, non-scaling, inputs. We perform an integrated monthly-scale simulation of the Hylike natural lake, which is one of the four reservoirs of the water resource system of Athens. Reservoir inflows, evaporation and precipitation on the lake surface, as well as leakage, which is significant due to the karstic subsurface of the lake, are all considered into the simulation. The reservoir inflows are generated by two alternative monthly stochastic models, a short term persistence model and a long term one, both cyclostationary. The resulting differences of the two approaches in the reservoir yield-reliability relationship and the frequency of multi-year drought periods (i.e. those that demand is not fully satisfied) are discussed.