Computing the Yield from an Infinite Reservoir

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Abstract. The present paper presents a procedure for preliminary estimations of the efficiency (η_M) of a reservoir having infinite capacity. Monte Carlo Method was used to find the yields under different conditions, such as: coefficient of variation of annual inflows (CV) ranging from 0.5 to 1.6 and dimensionless evaporation factor (f_E) ranging from 0.05 to 2.0. Assuming infinite storage, the reservoir was simulated on its steady state (simulation horizon equal to 2,000 years) and the annual reliability (G) was assumed equal to 90% . The basic assumptions used to develop the model were: time is discrete and time step is a year; reservoir volume is discrete; serial correlation of annual inflows is zero; all inflows occur in a wet season and all output in a dry season and inflows come from a Gamma II distribution. The equation for reservoir efficiency has the following form:

$$\eta_M = 0.99 \exp [f_E / (1.5031 - 1.7104CV + 0.8555CV^2 - 0.1528CV^3)$$

The main objective is to provide, quickly and with a certain accuracy, a tool for estimate the efficiency of an infinite reservoir.

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