The Role of Hydrology in Water Resources Management (Proceedings of a symposium held on the island of Capri, Italy, October 2008). IAHS Publ. 327, 2009, 144-150.

Integrated water resources management: development of data parsimonious models for reservoir planning

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Abstract Data parsimonious models are developed which offer the realistic possibility for reservoir storage-yield-reliability (S-Y-R) planning analysis at ungauged sites. One of the models was based on multiple linear regression analysis and the second set of models were designed using artificial neural networks (ANNs); both models use input variables comprising runoff summary statistics, e.g. the CV of annual runoff, and reservoir systems variables such as the demand and reliability index. The models performed satisfactorily when tested using independent data sets not utilised during their development. Finally, algorithms for obtaining the runoff summary statistics at ungauged sites are presented.

Key words artificial neural networks; storage-yield-reliability; sequent peak algorithm; over-year capacity; within-year capacity; multiple regression; ungauged sites