Ila Dashora et al., Hydrol Current Res 2014, 5:4
http://dx.doi.org/10.4172/2157-7587.S1.013

OMICS Group Conferences
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3rd International Conference on
Hydrology & Meteorology
September 15-16, 2014 Hyderabad International Convention Centre, India

Comparative study of ARIMA, Thomas Fiering and ANN models for streamflow generation of intermittent river for Narmada River basin

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Synthetic generation of streamflow data facilitates the planning and operation of water resource projects. Short term synthetic streamflow generation helps to operate multipurpose water resource projects whereas long-term forecasting facilitates flood control operations. Significance of streamflow generation for intermittent river increases many fold so that available water can be use yearlong. In the present study monthly streamflow data for intermittent river Goi of Narmada river basin is been used. Herein the performance of stochastic streamflow generation models - ARIMA (p, d, q) and Thomas-Fiering model are being compared with Artificial Neural Network approach. The study reveals that ANN performs better than stochastic models. The neural network application in proportion of 70:15:15 for training, validation and testing respectively performs best among other ratios. Stochastic model ARIMA (2, 1, 2) has more reliability over Thomas-Fiering model. The performance is measured on the basis of RMSE and coefficient of determination. This forecasting is helpful for small dam construction so that water can be harnessed for multipurpose utility.

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