

Economic functionality of Water Supply System Model (Wathnet) for Asset Planning

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Abstract

WaterNSW uses WATHNET, a generic water balance model for strategic and technical planning of the Greater Sydney water supply system. The model is run for a series of synthetic replicates containing stochastic climate and streamflows data similar to historic data. The WaterNSW's Greater Sydney water supply system yield is the maximum annual average demand that can be supplied by the system whilst conforming to the design criteria. Sydney's raw water supply system is designed to meet service standards to ensure supply continuity and to minimise the frequency and duration of water restrictions. The system's performance is assigned against a series of criteria such as reliability, robustness and security. The WATHNET model was used to develop Greater Sydney Metro Water Plan in 2004, 2006 and 2010. After the Metro Water Plan scenario modelling, all the scenarios were costed for further assessment. This was done outside the system model Wathnet. A need was identified that it would be more efficient and transparent if an economic assessment of the system's performance for each of the synthetic inflow replicates was performed through the system model. The new version of WATHNET modelling software incorporated an economic functionality along with the system supply system simulation model and the model was used to firstly build a model which closely represents the WaterNSW's Greater Sydney water supply system previously simulated using WATHNET. The purpose of this paper is to demonstrate the new Wathnet model's economic functionality and its application in asset planning.