

Quantitative model of the coupling system of water quantity– water quality–ecology

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Abstract Ecosystems and hydro-systems are very complex, interact and are interconnected. However, it is necessary, though difficult, to build a model for coupling water quantity, water quality and ecology. On the basis of a case study, a quantitative model of the coupling system of water quantity–water quality– ecology (WQQE) has been developed. The WQQE model has three parts: water quantity equilibrium, water quality function, and ecosystem simulation. The procedures for developing the model are summarized in the paper. The model has been used in the Bosten Lake basin, west China. The results demonstrate that the model can be used to mimic the hydro-ecological exchange processes of the coupled water quantity–water quality–ecology system and to provide a base model for water resources system management.

Keywords coupling systems of water quantity–water quality–ecology; water quantity–water quality–ecology model (WQQE); modelling method; hydro-ecosystem; water resources
