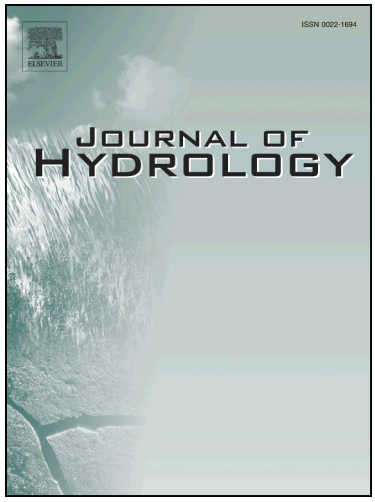

Research papers

Identification of the optimum groundwater quality monitoring network using a genetic algorithm based optimization approach

M. Tamer Ayvaz, Alper Elçi

PII: S0022-1694(18)30412-8
DOI: https://doi.org/10.1016/j.jhydrol.2018.06.006
Reference: HYDROL 22855

To appear in: *Journal of Hydrology*

Received Date: 19 March 2018
Revised Date: 30 May 2018
Accepted Date: 4 June 2018

Please cite this article as: Tamer Ayvaz, M., Elçi, A., Identification of the optimum groundwater quality monitoring network using a genetic algorithm based optimization approach, *Journal of Hydrology* (2018), doi: https://doi.org/10.1016/j.jhydrol.2018.06.006

IDENTIFICATION OF THE OPTIMUM GROUNDWATER QUALITY MONITORING NETWORK USING A GENETIC ALGORITHM BASED OPTIMIZATION APPROACH

M. Tamer Ayvaz[(1)], Alper Elçi[(2)*]

[(1)] Department of Civil Engineering, Pamukkale University, Denizli, Turkey

tayvaz@pamukkale.edu.tr

[(2)] Department of Environmental Engineering, Dokuz Eylül University, Izmir, Turkey

alper.elci@deu.edu.tr

* Corresponding author

Abstract

Management of groundwater requires a sufficient coverage of accurate groundwater quality data. These data are usually collected from monitoring wells which are spatially distributed in the river basin or the groundwater body that is studied. A minimum number of monitoring wells with an optimum spatial distribution is desired to ensure a cost-effective observation of the groundwater body. Therefore, the configuration of groundwater monitoring networks and the number of required wells becomes an important engineering optimization problem. The goal of this study is to find an optimum monitoring network with the fewest wells that provides sufficient spatial coverage on groundwater quality. With the presented method redundant wells in an already existing network are identified. Here, a genetic algorithm (GA) based optimization approach is used in which each monitoring well in the watershed is