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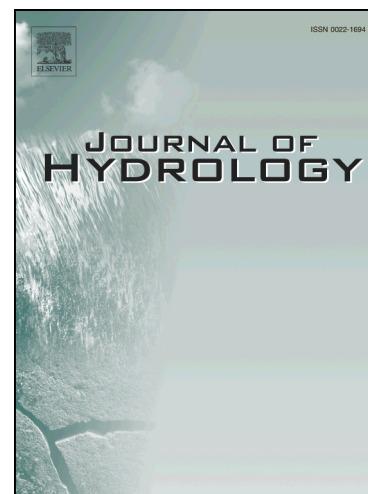
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Exploring the Spatio-Temporal Interrelation between Groundwater and Surface Water by Using the Self-Organizing Maps

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Abstract

In this study, we propose a soft-computing methodology to visibly explore the spatio-temporal groundwater variations of the Kuoping River basin in southern Taiwan. The self-organizing map (SOM) is implemented to investigate the interactive mechanism between surface water and groundwater over the river basin based on large high-dimensional data sets coupled with their occurrence times. We find that extracting the occurrence time from each 30-day moving average data set in the clustered neurons of the SOM is a crucial step to learn the spatio-temporal interaction between surface water and groundwater. We design 2-D Topological Bubble Map to summarize all the groundwater values of four aquifers in a neuron, which can visibly explore the major features of the groundwater in the vertical direction. The constructed SOM topological maps nicely display that: (1) the groundwater

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