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Spatiotemporal analysis of aquifers salinization in coastal area of Yunlin, Taiwan

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In the past, time and space characteristics often discussed separately. This study adopts regionalized variables theory, and describes the water quality in terms of its structure in time and space to assess the situation of Yunlin. This study applied the Quantum Bayesian Maximum Entropy Toolbox (QtBME), which is a spatiotemporal statistics function, can be applied to estimate and map a non-stationary and non-homogeneous spatiotemporal process under the platform of Quantum GIS (QGIS) software. Kernel smoothing method is used to divide the original process into a deterministic trend and a stationary and homogeneous spatiotemporal process, assuming that a spatiotemporal process can be divided into high and low frequency. The covariance model of the process of high frequency is selected objectively by particle swarm optimization (PSO) method and Akaike's information criterion (AIC). Bayesian maximum entropy method is then applied to spatiotemporal mapping of the variable of interest. In this study, QtBME estimated the situation of aquifers salinization at Yunlin coastal area in 1992 to 2010. Finally, one investigated the rainfall and aquifers salinization on the degree of impact.