

EGU2020-6665

<https://doi.org/10.5194/egusphere-egu2020-6665>

EGU General Assembly 2020

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Gaussian process regression for spatiotemporal analysis of groundwater level variations.

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In geostatistical analysis a Bayesian approach has more advantages over classical methods since it allows to deal with the parameters and the uncertainty in the model. Spatiotemporal geostatistical modelling can be performed by using the Gaussian process regression method under a Bayesian framework. In a Bayesian approach the overall uncertainty can be represented by a probability distribution. In this work the groundwater level spatiotemporal variability was assessed based on a ten years' time series of biannual average data from an extensive network of wells in the island of Crete, Greece. The Gaussian process regression method was employed to produce reliable maps of groundwater level variability and to identify groundwater level patterns for the island of Crete. Thus, this work could help to detect areas where interventions of groundwater management are necessary considering the associated uncertainty.