# Outlier Detection for Anomaly Groundwater Level Time Series

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## ABSTRACT

The purpose of this study is to explore the anomaly of groundwater level (GWL) time series by the outlier analysis (OA) method in statistics. The data source comes from the observation stations of project Water Resource Agency and the title of project is “Planning of Groundwater Anomalies Associated with the Earthquake”. There are 8 observation wells for the study. Firstly, the BAYTAP-G model developed from Japan is used to filter the influences of affecting the GWL, including the atmospheric pressure, tide and irregular signal. Next, the OA method is used to detect the anomaly of GWL data series after noises filtering and compared to the anomaly announcement form (AAF) in this project.

To compare the results of OA to the AAF, the success ratio is near 82%. The AAF with seven-steps procedure is moderately subjective, but the OA with the standard operation procedure is more objective. It is found that the number of anomaly seems partial more with the statistical test of 95% confidence limit. If we increase the testing value appropriately, it can contribute to the explanation of the anomaly. In this study, the preliminary suggestion value is provided.