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# Adaption of a Water Quality Index for Using with Single, Few or Spatially Undistributed Surface and Groundwater Samples and Comparison with the Original GIS-Based GWQI

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## Abstract

The aim of this paper is to adapt a water quality index for individual samples and to compare the results with that of the original GIS-based approach. Thirteen water quality parameters observed in 97 wells from the Shahrekord aquifer were used. In GIS-based method, quality parameters maps are difference-normalized, ranked and GWQI map is drawn. In derived method, observations from individual wells were separately and similarly treated to obtain WQI for each well. Both GWQI maps displayed similar trends and were highly correlated (R=0.91). While the minimum and mean GWQI for both methods were identical (respectively 81 and 84) the derived method estimated the maximum GWQI slightly lower (7%) and showed up to 6% difference in water quality class coverage. Overall, the derived method GWQI is more correlated with observations and performs better than the GIS-based method, and therefore, can be used for determining the overall quality of individual water samples and without the requirement of samples being spatially distributed.

**Keywords:** Shahrekord, aquifer, GWQ Index, GIS, Sensitivity analysis.

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