

3 4**TIDAL EFFECT ON SHALLOW GROUNDWATER QUALITY AT COASTAL AREA, KIMJAE, CHOLLABUK-DO**

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The purpose of this study is to determine the effect of tide on the groundwater quality of the study area located near seashore, using electrical conductivity(EC) and groundwater level as indicator. EC and groundwater level of monitoring C well have been observed at every 15 minute for one month. The fluctuations of EC and groundwater level have been observed at coarse sand formation, and the results have shown that sinusoidal trends of fluctuation of EC and groundwater level are similar to that of tide. It means that seawater intrusion occurs through the coarse sand formation and the groundwater quality changes in response to tide. Considered daily fluctuations of EC and groundwater level, the daily fluctuation gap of EC and groundwater level is high at the time of th maximum in the daily tidal range and daily fluctuation gap of EC and groundwater level is small or ignored at the time of th minimum in the daily tidal range. This trend has a 16-day cycle. It indicates that the effect of tide on groundwater quality has a cycle, so groundwater quality changes in response to time and tide.

Using time series analysis to determine trends and cycles of EC and groundwater level, auto-correlation function of EC and groundwater level shows that EC and groundwater level has regulation time of 1.86 day and 1.93 day respectively. Spectral density function of EC and groundwater level shows a 16-day cycle. This cycle is similar to that of tide. It indicates that EC and groundwater level are affected by tide. Cross-correlation function of groundwater level as input and EC as output has shown high positive correlation. EC has a highest cross-correlation with groundwater level before 1 day. It means that groundwater flow is usually faster in horizontal direction than in vertical direction and high saline water is transported by advection or dispersion before groundwater level changes.