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title: **Some evidences of retreating saline groundwater body in the western coastal area at Seocheon in South Korea**

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Many part of the western coastal area in Korea has broad and flat lowland which is mostly consisting of alluvial deposits and reclaimed land. At those coastal area, high electrical conductivity and high concentrations of Na and Cl components in groundwater has been thought to be simply due to seawater intrusion into the nearby fresh groundwater aquifer. But, a lot of the reclaimed coastal area had been under the environment of intertidal zone for a long time, and therefore now can has somewhat brackish or saline shallow groundwater originated from fossil saline water captured within the intertidal sediments. This study area has been also geologically influenced by quaternary intertidal environment until the estuary dike of Geum river and reclaimed land was constructed for agricultural activity. Now, in this area, groundwater has broad TDS(contents of total dissolved solutions) from fresh through brackish and finally to saline water. Water quality is also complicated and can be classified as follows; Ca(Mg)-Cl(or NO₃), Ca(or Na)-HCO₃, Ca(or Na)-HCO₃(Cl), Na-Cl(HCO₃), Na-Cl type. Groundwater with Ca(Mg)-Cl (or NO₃) type water quality has mostly high NO₃ contents which means strong influences of agricultural activity. Surface water sampled at Bongseonji reservoir, Gilsan stream, drainage for agricultural use and Geum river has water quality of Na(Ca)-HCO₃(Cl) or Na(Ca)-Cl(HCO₃) type with relatively low NO₃ contents. These surface water has been used for agricultural purpose in the study area from April to September and continuously affected the quality of groundwater after land reclamation of intertidal zone. Generally, dominant cation and anion type of groundwater gradually changes from Ca⁺² and HCO₃⁻ at upper or middle reach to Na⁺ and Cl⁻ at lower reach of the Gilsan stream catchment. This indicates that groundwater quality is changing through seawater intrusion or flushing out process. The plots of Cl concentrations vs. Mg and Cl contents, Na/Cl molar ratio, SAR(sodium adsorption ratio) and NCHAR(non-carbonate hardness) indicates that fossil saline groundwater has been flushed out by fresh ground or surface water in the study area and the varied water quality has mostly resulted from this flushing out process. The plots of the TDS vs. Na, Cl and Mg concentrations show relatively good correlations, but Ca, K, HCO₃ and SO₄ concentrations show considerably scattered phenomena. This difference indicates that some complicated reasons such as agricultural effect and/or various end member of fresh water in respect of flushing out may be due to scattered features of groundwater quality.



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