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Characterization of groundwater salinization in the eastern coastal aquifers of Jeju Island, Korea

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The phenomenon of seawater intrusion has been widely reported in the coast of Jeju volcanic Island, Korea. The test site has been constructed and managed for multi-methodological approaches so that we may understand seawater intrusion and groundwater quality in coastal aquifers, the eastern coast of Jeju Island. Multi-depth boreholes have been drilled and cored to a depth of approximately from 50 to 150 m in the test site, which is known as a large pumping area for agricultural water supply. Various geophysical well loggings and monitoring provide valid information to characterize the variability of coastal aquifers at a temporal and spatial resolution. The natural gamma profiles and core logs with high-resolution borehole image logs enable us to estimate stratigraphic cross section and interpret inter-borehole. We try to understand a heterogeneous aquifer system, and also estimate the behavior of freshwater and saltwater in the test site. Furthermore, using a discrete point fluid sampler logs, multi-depth groundwater samplings are carried out to get a detailed hydrogeochemical analysis of groundwater. Saltwater, freshwater, and brackish water were characterized by salinization indicators such as EC, TDS, Cl concentration. Our various approaches could enhance knowledge of subsurface structure and freshwater and saltwater transition zone characteristics in coastal areas.