

Contrast of groundwater ages around saltwater-freshwater mixing zone

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The unique feature of this study is to obtain the vertical profile of groundwater age at a beach with very active groundwater flow. We, Geological Survey of Japan, has been conducted hydrogeological surveys at coastal areas, because coastal area is one of the candidates for geological repository of high level radioactive waste in Japan. The aim of the study is to check the stability of saltwater-freshwater mixing zone below active groundwater flow in Quaternary unconsolidated fan deposit, which is an extreme hydrogeological condition. We carried out a drilling up to 350m in depth with taking groundwater samples at several depths. In addition, groundwater sampling has been done from more than 50 wells in the basin.

At the drilling site, at a distance of 50m from shoreline, the groundwater chemistry and resistivity log indicate that saltwater-freshwater mixing zone ranges from 120 to 150m depth. Below the 150m depth, saltwater distributes. The ages of freshwater and saltwater have contrasting characters: freshwater age ranges from modern to several hundred years while the saltwater has more than 10000 years. On the other hand, the ⁴He age do not agree with the ¹⁴C ages for the water in saltwater-freshwater mixing zone.