

## Seasonal changes on groundwater-seawater interaction by resistivity survey and CTD sensor measurements

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In Japan, rice fields are widely distributed in the plain, and amount of precipitation have remarkable seasonal change. In this area, it is considered that groundwater discharge rate and nutrient discharge rate also have any seasonal changes. However, there are few previous studies about these seasonal changes. So, in order to make clear the seasonal change of groundwater-seawater interaction, we measured continuously water level, electric conductivity, and water temperature by CTD sensor in some observation wells which is excavated at tidal zone, and carried out resistivity survey at the coastal zone, Shiratsuka coast, Mie prefecture.

Monitoring wells which had the depth of 5m, 10m, and 20m were excavated at the two sites in tidal zone. Each well site has different geological condition. The Additional 30m depth well was excavated in the thick Holocene deposits site. Conductivity-temperature-depth (CTD) sensor was installed in each well and continuous measurement of electric conductivity, water temperature, and water level were made at 15-min intervals from December 1st 2005. Hourly measurement of resistivity among onshore to offshore was made from low tide to next low tide during the spring tide from February 2006.

When we discussed about fresh water and salt water distributions, resistivity survey results was compared with electric conductivity of CTD sensor measurements.

As a result, the patterns of groundwater-seawater interaction depend on seasonal conditions. Each depth groundwater have each unique seasonal change characteristics influenced by tidal condition in the observation wells. SGD location where was estimated by resistivity survey changes from offshore to near coast during low tide to high tide. These patterns are different from summer season and winter season.

Deep groundwater discharge has remarkable seasonal changes. It depends on tidal seasonal change which is affected by the inland groundwater discharge rate and amount of precipitation, especially seawater intrusion during high tide control to SGD in the coastal zone.