

Quantitative evaluation of submarine groundwater discharge in the coastal zone of Osaka Bay

Tomotoshi Ishitobi[1]; Makoto Taniguchi[1]; Yu Umezawa[1]; Kunihide Miyaoka[2]; Shinichi Onodera[3]; Masaki Hayashi[4]; Mitsuru Hayashi[5]

[1] RIHN; [2] Faculty of Education, Mie Univ.; [3] Integrated Sci., Hiroshima Univ; [4] Biosphere Sci, Hiroshima Univ; [5] KURCIS

Recognition of the importance of submarine groundwater discharge (SGD) is increasing for the studies on water and dissolved material transports from land to the ocean. SGD research using several methods has been done to understand the processes of SGD. Seepage meter method, resistivity method and measurement of temperature on the seabed have been applied for this study.

Study site is located in the coastal zone of Osaka bay, Japan. The length of the inter-tidal zone in the study area is 150m. The average of tidal change of Osaka bay ranges from 1 to 1.5m. In this site, 5 seepage meters were installed to evaluate the variation of SGD due to tidal change. Resistivity values under the seabed were also measured to estimate the distributions of freshwater and salt water. In general, temperature of terrestrial groundwater is lower than seawater. Therefore, it is assumed that temperature near the seabed become lower than surround if groundwater discharge from the seabed occurs actively. Therefore, temperature measurement of the seabed also has been done to attempt the evaluation of SGD by temperature.

As the results, it is clarified that submarine groundwater discharge decrease with the distance from the coast. However, SGD rates were highest in the location near the coast line of low tide. It is clarified that SGD rates from seepage meters correlate with temperature of seabed. Therefore, it is suggested that temperature measurement of seabed is useful to evaluate SGD. As the conclusion of this study, the processes and flow paths of SGD were evaluated from the field data with several different methods.