

Study on submarine groundwater discharge in Kurobe, Japan

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Submarine groundwater discharge (SGD) is now recognized as a potentially significant material pathway from the land to the ocean. SGD may be both volumetrically and chemically important to coastal water and chemical budgets. A worldwide compilation of observed SGD shows that groundwater seepage from the land to the ocean occurs in many environments along the world's continental margins. Further, SGD has a significant influence on the environmental condition of many nearshore marine environments and provides a strong motivation for improved assessments. In this study, SGD rates and chemical components of SGD were measured in Kurobe, Japan, from July to September 2001, to evaluate the factors which affect the variations of SGD rates and chemical components of SGD.

Average of the observed SGD rate at Yoshiwara nearshore area in Kurobe, was evaluated to be 0.002 cm/sec. According to the water and material balances analyses using the electrical conductivity of SGD, the component of the fresh groundwater among the SGD was estimated to be 0.95. Continuous measurements of SGD revealed semi-diurnal periodical changes in SGD. This is attributed to the tidal effects on SGD. The time delay of the SGD from tidal records was found to be about 4.5 hours. According to the relationships between SGD and meteorological data, the time delay of the SGD from precipitation was also found to be about 10 to 12 hours.