

Characteristics of nutrient change via submarine groundwater discharge at large tidal flat.

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Many previous researched had reported the significant nutrient supply by the submarine groundwater discharge. To clarify spatial variation of nutrient discharge in one of a largest tidal flat of Seto Inland Sea, we observed subsurface flow and dissolved nitrogen, phosphorus, and silica, using piezometer and tracer method. The study area is located on Saijo city, Ehime prefecture, western Japan. The tidal flat has the width and length of 1km. We installed three piezometers for observing water potentials, and we collected pore water samples at the about 50 plots. In addition, 222Rn concentrations of seawater were monitored in front of the tidal flat.

The 222Rn and salinity of pore water indicated that discharges of shallow groundwater at the landside and deep groundwater at the shoreside of the tidal flat, respectively. The discharge volume was larger in shallow groundwater than in deep groundwater. The nutrient included the nitrogen as well as phosphorus and silica. Based on these observations, the large contribution of nutrient was confirmed from groundwater to this coastal area. The temporal variation of 222Rn indicated that shallow and deep groundwater affected to offshore before and after the low tide, respectively. The time lag between shallow and deep groundwater discharge was about 4 to 6 hours.

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