

AHW018-05

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Effects of Urbanization on the Groundwater Discharge into a Semi-closed Bay: Osaka Bay, Japan, Based on Rn measurement

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At Osaka city, an increase of groundwater level after the regulation of groundwater pumping has potential to increase submerged groundwater discharge and associated nutrients fluxes into adjacent bay, Osaka Bay. We carried out continuous ²²²Rn measurements at two locations and along the shoreline. ²²²Rn activities were low along the reclaimed land areas with a large river, Yodo River (i.e., 0.5 to 2.5 dpm/l), while the values slightly increased up to 4.0 dpm/l at suburban areas without main rivers. Although Yodo River was likely fed by groundwater in part, the diagram with salinity and ²²²Rn activities was effectively used to distinguish the coastal water affected by direct groundwater discharge with those having river water discharge. The direct groundwater flux calculated along the shoreline ($2.0 \times 10^4 \text{ m}^3/\text{day}$) was minor compared with river water discharge at a whole-bay scale, while considered to be important source of nutrients especially at the areas far away from the river mouth, due to higher nutrients concentrations in groundwater.

Keywords: groundwater discharge, Osaka Bay, radio isotope, coastal ecosystem, nutrients