

Nutrient transport with the river water-groundwater interaction in the tidal reach of the Yamato river basin

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In tidal reaches of river basins, river water levels fluctuate significantly with the seawater intrusion. It may enhance the river water-groundwater interaction and the associated change in dynamics of nutrients. However, effects of the nutrient transformation in tidal reaches on the nutrient load from river to the sea have not been fully evaluated in previous studies. Therefore, we tried to clarify the characteristics of the nutrient transport with the river water-groundwater interaction in the tidal reach of the Yamato river basin flowing into the Osaka bay.

We conducted the field survey from the river mouth to the 6~7km upstream area. Spatial variations in radon (²²²Rn) concentrations and the difference of hydraulic potential between river waters and the pore waters suggest that the groundwater discharges to the river channel in the upstream area. In contrast, the river water recharged the groundwater near the river mouth area. It may be caused by the lowering of groundwater level associated with the excess abstraction of groundwater in the urban area. The result also implies the seawater intrusion would accelerate the salinization of groundwater. The spatial and temporal variations in nutrient concentrations indicate that nitrate-nitrogen (NO₃-N) concentrations changed temporally and it negative correlated with dissolved organic nitrogen (DON) concentrations. Inorganic phosphorous (PO₄-P) concentrations showed the increasing trend with the increase of the river water level.

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