Effect of seawater recirculation on dissolved nitrogen dynamics in tidal flat, urban area

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To clarify dynamics of dissolved nitrogen in intertidal groundwater, we observed subsurface flow and dissolved nitrogen with tidal variation, using piezometer method. We installed a pair of piezometers with various depths at some plots on an intertidal in Omaehama Beach, Osaka Bay, western Japan. Hydraulic heads were measured and intertidal groundwater, terrestrial groundwater seawater were collected at all piezometers at two or three hours interval on August in 2006 and October in 2007. Water samples were analyzed for Cl-, NO3–N, NO2–N and NH4–N, N2, and Ar, respectively. We estimated the dissolved nitrogen fraction concentration of intertidal groundwater, based on the mixing process of inland groundwater with seawater.

We confirmed production and disappearance of Inorganic-nitrogen in general. It was suggested that ammonification and denitrification process. Ammonification and denitrification occurred on low tide but nitrification of NH4+-N and NO3–N occurred as a result of seawater recharged by rising tide at Omaehama. We confirmed the production and disappearance process of dissolved nitrogen at a time and dynamics of dissolved nitrogen fraction transform by water mixing process with tidal variation in intertidal groundwater.