

# Nitrogen discharge process in the mixing zone of coastal ground water with seawater

# Masaki Hayashi[1]; Shinichi Onodera[2]; Tsutomu Takei[1]; Mitsuyo Saito[3]; Takaki Mine[1]

[1] Biosphere Sci, Hiroshima Univ; [2] Integrated Sci., Hiroshima Univ; [3] Grad., Biosphere Sci., Hiroshima Univ.

To clarify discharge process of groundwater with highly concentrated nitrogen into the sea, we observed subsurface flow and nitrate flux with tidal variation, using piezometer method. We installed a pair of piezometers with various depths at 4 plots on a relatively slopy beach in Ikuchijima Island, measured hydraulic head and collected water at all piezometers and a well at distance of 100m to landward from the shoreline inland area at two or three hours interval from low tide to low tide on September 5 and 14, 2004. Water samples were analyzed for Cl- and DN (Dissolved Nitrogen), respectively. Soil sample was analyzed for hydraulic conductivity. Groundwater discharge was confirmed at the vicinity of shoreline, mixing with seawater. Because it stopped during the high tide, groundwater contribution ratio increased below the shoreslope. Nitrogen concentration in groundwater at the landward well was high, whereas, it declined in the subsurface water below the shoreline. We estimated the DN concentration of beach subsurface water, based on the mixing process of inland groundwater with seawater. The calculated one was extremely higher than actual one. These results suggest denitrification on the beach. In addition, based on this research, the difference between calculated and actual ones was large in stagnant subsurface water with high groundwater contribution ratio during the high tide. We confirmed the dynamics of nitrate decline and two types of water mixing processes with tidal variation.