

Age and nutrient properties of coastal groundwater in Osaka: for confirmation of groundwater buffer effect

Shin-ichi Onodera^{1*}, Yuta Shimizu¹, Yoshiaki Kato¹, Hiroataka Arimoto², Kazuyoshi Asai³

¹Hiroshima University, ²Geo-Research Institute, ³Geo-Science Laboratory

To conserve the coastal environment and marine pollution, we confirm the age and nutrient properties of coastal groundwater in Osaka and discuss about the groundwater buffer effect on the coastal marine environment. Both of river water qualities and marine quality in Osaka became worst declining in 1970. The large contaminant discharge at Osaka was reported by some researches during the intensive increasing period of population. But the ocean environment had not recovered after the contaminant load by river decreased rapidly. One of the reasons was suggested as the delayed contaminant discharge by groundwater. After 1970, the groundwater pollutions including nitrate have appeared around Osaka. But, the results of our observation in a tidal slope indicated less nitrate discharge under the significant submarine groundwater discharge. In addition, the residence time of coastal groundwater in Osaka was about 50 to 60 years around the intensive polluted period. But nutrient properties of coastal groundwater were phosphorus and silica rich but nitrate lack. These suggest groundwater was one of the buffers of nitrate pollutions and the purification zone of nitrate. On the other hand, the results in a tidal slope indicated the regeneration of nitrate in offshore, and it suggests continuous nitrate supply from polluted sea bed to the marine.

Keywords: nutrient, contaminant, discharge, ocean, river, groundwater