

## Effect of groundwater movement on nitrite variation and redox condition in groundwater

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### Introduction

Nitrite pollution in groundwater from agriculture area has become a serious problem and it has been caused widely concern. On the other hand, denitrification works as purification action to decrease nitrite in the groundwater, which generally occurred under reduction condition with low dissolved oxygen. However, the research related to mechanism of groundwater movement on redox condition of groundwater is still not enough. In our research, we would like to focus on the redox condition affected by the variation of groundwater movement from a granite unconfined aquifer. And consider its possible impact on denitrification in groundwater.

### Location

The study area is located on southern part of Ikuchi Island in central Seto Inland Sea, Japan. The catchment is characterized by steep topography underlain by granite and the bedrock outcrops in up streams area. There shows a small slope near coastal area with the slope of about 1/50. An alluvial fan is formed in the downstream area. As the land use, the orchard of citrus fruits is distributed widely in a basin.

### Methods

The observation boreholes are installed at the depths of 15m and 30m in downstream site, the water levels and ORP of each borehole were monitored by automatic data loggers. And water samples were collected at the interval of one month from 2014/9 to 2015/2. During sampling, The DO and ORP were monitored onsite for the calibration of data. After sampling, the water sample were brought back for analysis, NO<sub>3</sub>-N concentration was analyzed by auto analyzer and Cl<sup>-</sup> was analyzed by Ion chromatography.

### Result and Discussion

he results shows the redox potential showed relatively low level to during the periods between 2014/9 and 2014/12. Which related to the lower groundwater level resulting from small precipitation at that periods. It decreased the groundwater velocity and increased the retention time of groundwater, therefore, the redox condition would like to shift to reduction condition rather than the oxidation condition. NO<sub>3</sub>-N concentration of 15m borehole is about 9ppm and NO<sub>3</sub>-N concentration of 30m borehole is about 6ppm.Both of sample show relatively high DO. Therefore, denitrification cannot works actively. The detailed information of nitrate concentration variation accompany with the redox condition change will be shown in this poster.