

Relationship between the hydrogeomorphology and hydrogeology and the groundwater flow system in the Shitomo River Basin

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There are many several cities at the coastal are of Ise Bay where is the closed water area. So, it is concerned that eutrophication takes the nutrient which was produced by human activities in inland area transport with river water or groundwater to Ise Bay. To evaluate quantitatively the amount of nutrient transport from inland to the sea, there are many matters which should to make clear at inland area; the groundwater flow system, the relationship between groundwater qualities and the landuse, and so on.

Then, the purposes of this presentation are as follows; (1) To show the result of hydrogeomorphologic and hydrogeologic analyses. (2) To show the relationship between the hydrogeomorphology and hydrogeology and the inland groundwater flow system.

Topographic map, geologic map, and Geologic logs which are published already are collected. Boreholes were made in 17points of the study area, and soil samples were collected each 1m. Electric conductivity, pH, water temperature, and water level were measured at 17 boreholes, 70 family wells, and 9 points of Shitomo River and its branch. Water samples were also collected at the same points for chemical analyses. Cation and anion were analyzed.

According to the distribution of past river channels which were shown in geologic strata and the distribution of summit level contour line, the geomorphologic and geologic features in Shitomo River basin are also shown in the Ano River basin. This suggests that a fluvial fan is formed at the upland area (90m – 10m a.m.s.l. area) in the Shitomo River basin, this alluvial fan is portion of Ano River alluvial fan. The amounts of river water discharge of Shitomo River increase at the around of knick point of river bed. So, it is possible that this point is the spring of the end of the fan. The past river channels also shown in under the ground of the coastal plain. However, the depth to the estimated past river bed is different from each region. This suggests that Shitomo River channel changes depend on each era.

The water level contour lines resemble those of the land surface topography at the alluvial fan area. On the other hand, some valley-shaped water tables are distributed over the coastal plain area. These valley- shaped water table locations area similar to the location of the past river channel which is shown in geologic logs.

High electric conductivity are distributed over the central fan where the seed bed are mainly distributed. Low electric conductivity is distributed over the top and the end of fan, respectively, these water quality compositions are almost the same. So, these groundwater flows the same groundwater flow path. Another high electric conductivity is distributed at the location of the valley-shaped water table at the coastal plain. NO₃ ion concentration is high at the central fan, but Cl ion concentration is high at this area. The origin of high Cl ion concentration is probably the sea water which was intruded from the sea, because there is nothing the assumed origin in the inland area.

As a result, it is recognized the groundwater flow and quality formation are controlled by the landuse condition at the alluvial fan, but these formations are controlled by hydrogeological condition at the coastal plain.