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Analysis of hydrological circulation along to Shiratani River in The Yakushima Island

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The Yakushima Island has a large amount of precipitation. It is easy to analyze water cycle because of symmetrical conical shape. However, in the Yakushima Island, there are not enough data for river flow rate although it is important to measure river flow rate at the condition of high precipitation. Therefore, flow rates of river in the Yakushima Island are measured to estimate the amount of groundwater. The amount of groundwater is estimated from the surface runoff, evapotranspiration and precipitation and the water cycle is clarified at the granite island under the condition of high precipitation.

Precipitation and flow rate are measured along the Shiratani River to estimate the amount of groundwater. As a result, infiltration rate at small catchments from 200 to 1000m in height are about 70 % on average. The maximum and minimum infiltrate rates are 90 and 50 % respectively. Generally, infiltration rate is 35 % at the forest and 10 % with no trees. Although infiltration at the weathered granite rock and forest area is generally high, the estimated infiltration rate is too high. River flow rate is too small because the measuring day is almost fine day for safety and it changes with rain. Therefore, infiltration rate reaches high. Next, river flow rate depends on position along a small river. As most of water once infiltrates into soil and then effluents, river flow at the monitoring site between recharge point and discharge point is changeable and although each catchment is the same size and adjacent, infiltration rate may range from 50 to 90 %. At the next measuring, fresh basement with river flow must be selected as a monitoring site because small water between recharge and discharge migrates and almost recharged water discharges before the point.

Keywords: yakusima, hydrological circulation, groundwater, quantity of flow