

The evaluation of regional water balance based on the actual evapotranspiration in Uto Peninsula

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Many studies on the mountainous bedrock groundwater aquifer have not been conducted very much. Therefore, the research on the groundwater flow system in the mountainous igneous rock aquifer is done in a part of Uto Peninsula in Kumamoto Prefecture. The purpose of this study is to analyze the regional water balance more precisely measuring the actual evapotranspiration.

The actual evapotranspiration was measured using the Bowen ratio method and the reference evapotranspiration estimated by the Penman-Monteith using the meteorological data. Based on this derived evapotranspiration data, the basin evapotranspiration was calculated for every altitude, vegetation, and season.

The downstream basin of Nishi-ura River tended to have the largest value of evapotranspiration. In particular, this trend was remarkable in summer season. In contrast, this trend was disappeared in winter season.

Compared with Takahashi model (Takahashi, 1979), the regional evapotranspiration obtained with the method of this study was more value than Takahashi model with 2003-2005 year. As a result, the regional actual evapotranspiration was about half value of precipitation.

The difference of rainfall-runoff processes influenced the water balance by volume.