

Analysis of Future Discharge in Nakdong River Basin According to Effect on Climate Change

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Abstract. Climate change has affected in water resources and environment all over the world and its impacts assessment and adaptation are very important issues that are significant in terms of science and policies. In view of water resources, estimation of discharge is essential to make basic data in watershed management, flood, drought, and water environment. The change of discharge has affected both eco-system and human system. So that, using technical methods are necessary to develop nature restoration and disaster reduction. Therefore, this study applied to GCMs (General Circulation Models) using A1B scenario which reflects climate characteristics of Korea well and analyze out the future climate change discharge. Based on selection of the most appropriate GCMs in Korea, which is the most fundamental and basic stage for climate change analysis, and application of downscaling techniques for precise materialization of Korea's meteorological patterns in terms of space and time, the current climate change scenarios and those forecasting the next 90 years were produced and applied. The SWAT model of hydrologic models was used for analyzing discharge at Nakdong River. The main result of this study is compared and analyzed at Nakdong River basin points about discharge by A1B scenario. The study period (2011~2100) was divided into three periods (F1:2011~2040, F2:2041~2070, F3:2071~2100) and compared with observed data for 1980~2009. Consequently, upper and downstream points showed that the future discharge more increase than present. By the seasons, spring in the upper site was presented the highest discharge compare to summer, fall, and winter and the future discharge in the downstream showed lots of increasing all seasons. Overall, MPEH model presented the highest discharge value in the annual and season analysis except F1 (2011~2040) period. This study presents technical methodology for assessing influence on water environment resources. Furthermore, the results of this study expect to be quantitative and reliable data in studying climate change throughout the application to other rivers. If water environment impact assessment and analysis of the future water balance including a forecast of water supply and demand take place based on the results of this study, the results will be sufficiently valuable both as researches on national measures to climate change and policy materials.

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