

Identification of low-flow parameters a using hydrological model in selected mountainous basins in Japan

**KAZUMASA FUJIMURA¹, YOSHIHIKO ISERI², SHINJIRO KANAE² &
MASAHIRO MURAKAMI³**

1 School of Science and Engineering, Meisei University, 2-1-1 Hodokubo, Hino, Tokyo 191-8506, Japan
fujimura@ar.meisei-u.ac.jp

*2 Department of Civil Engineering, Graduate School of Science and Engineering, Tokyo Institute of Technology, 2-12-1
Ookayama, Meguro-ku, Tokyo 152-8550, Japan*

*3 School of Environmental Science and Engineering, Kochi University of Technology, 185 Miyanokuchi, Tosayamada,
Kami-city, Kochi 782-8502, Japan*

Abstract Accurate estimation of the low-flow discharge is very important in evaluating the impact of climate change on water resources. This study focuses on the storage–discharge equation and the optimal parameters of the low flow. In order to investigate the sensitivity of the two parameters in the process of the calculation of low flow, we prepared 19 900 sets of the two parameters in the storage–discharge equation and carried out hydrological analysis using the hourly hydrological model presented by Fujimura *et al.* (2012). The study basins are the Sameura Dam basin (SAME basin) located in western Japan which has variability of rainfall, and the Shirakawa Dam basin (SIRA basin) located in a region of heavy snowfall in eastern Japan. The period of available hydrological data is 20 years for the SAME basin and 10 years for the SIRA basin. The results suggest that the optimal combination of two parameters can be identified by exponential equations. This study also estimates the annual water balance for the two basins based on hydrological analysis using the optimal parameters in the storage–discharge equation of low flow.

Key words low-flow; storage-discharge exponential function; optimal parameter; sensitivity analysis; hydrological analysis