

## **Application of Deep Learning to Rainfall-Runoff Modeling at Kikuchi River Basin**

Kei Ishida<sup>1,2</sup>, Hiroataka Une<sup>3</sup>, Hiroto Kondo<sup>3</sup>, and Kazuki Kuranaga<sup>3</sup>

*1. Faculty of Advanced Science and Technology, Kumamoto University*

*2. International Research Organization for Advanced Science and Technology, Kumamoto University*

*3. Graduate School of Science and Technology, Kumamoto University*

E-mail: keiishida@kumamoto-u.ac.jp

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### **Abstract**

Machine learning is nowadays a useful tool for many purposes. Especially, its advanced version, so-called deep learning, is a hot topic in many fields. This study utilized one of the deep learning methods, which is called recurrent neural network (RNN), for rainfall-runoff modeling at Kikuchi River Basin, Kumamoto in Japan. RNN is suitable to time series analysis because it has a memory. In this study, RNN was used to reconstruct flow discharge at Kikuchi River. For the reconstruction, only precipitation data were used as inputs. The parameter fitting of RNN was conducted, and then the parameters were validated during another period. Then, some goodness-of-fit tests were carried out to evaluate the applicability of RNN at the Kikuchi River basin. The goodness-of-fit tests show that RNN can reconstruct flow discharge well at the Kikuchi River basin