Introduction of Canopy Component into Isopycnal-layered model and Comparison with Cell Distributed Runoff Model at Kyushu

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An isopycnal-layered model was suggested by Kida and Yamashiki (2015) as an attractive model for simulating land-ocean processes. The model can handle the hydrodynamics on land and oceanic flows, and their interaction seamlessly. However, because the original model was focused on oceanographic flows, hydrological processes on land were absent. We, therefore, introduced basic hydrological components in the model and performed several tests for evaluation. We will focus on the rivers in the island of Kyushu, Japan. The infiltration ratio and storage ratio in each canopy were set and included in hydrological processes for the forest zone. By introducing such basic hydrological component, we consider the model applicable for various river basins with minimum requirement and significantly facilitate studies on how continental-oceanic processes can be integrated. Preliminary numerical experiments show discharge events from Japanese first-class rivers of Kyushu, such as Shira-river, with freshwater plumes forming in the ocean. We expect to compare these calculations to Cell Distributed Runoff Model Version 3.1.1 (CDRMV3.1.1) to examine the capability of the model.

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