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Use of AWS, GPS, and Radiosonde observations to improve the 0-36h streamflow forecasts

Lei Wang (1), Toshio Koike (1), Jianyu Liu (2), Man Wang (2), Jihua Sun (2), Hui Lu (1), Hiroyuki Tsutsui (1), Katsunori Tamagawa (1), Juan Li (3), and Xiangde Xu (4)

(1) The University of Tokyo, Department of Civil Engineering, Japan (wang@hydra.t.u-tokyo.ac.jp), (2) Yunnan Institute of Meteorology, China Meteorological Administration, China, (3) National Meteorological Center, China Meteorological Administration, China, (4) Chinese Academy of Meteorological Science, China Meteorological Administration, China

The real-time streamflow forecasting is largely determined by the quantitative precipitation forecasting (QPF), but convective weather remains a significant challenge for numerical weather prediction systems. The unreliable accuracies of the streamflow forecasts largely contributed to the historical flood disasters all over the world, including the southwest of China.

In this study, the 36-h real-time streamflow forecasts with the Advanced Research Weather Research and Forecasting Model (WRF-ARW) and a distributed biosphere hydrological model (WEB-DHM) on 01 July and 15 July 2008 are presented. Results in the upper Nanpan River Basin of China demonstrated that the assimilation of the new and integrated meteorological observations into the WRF-ARW model has led to significant improvements on the 0-36h real-time QPF, and thus more reliable short-term streamflow forecasting. The newly-assimilated data includes the observations obtained from the newly-built Automatic Weather Stations (AWS), Global Positioning System (GPS), and Radiosonde in southwest China, funded by the cooperative JICA project between Japan and China.