

# Potential of assimilating river discharge observations into the atmosphere by strongly coupled data assimilation: Hydrometeorology as an inversion problem

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We examine the potential of assimilating river discharge observations into the atmosphere by strongly coupled data assimilation. The Japan Meteorological Agency Non-Hydrostatic atmospheric Model (JMA-NHM) is first coupled with the simple rainfall-runoff model. Next, the Local Ensemble Transform Kalman Filter (LETKF) is used for this coupled model to assimilate the observations of the rainfall-runoff model variables into the JMA-NHM model variables. This system enables to do hydrometeorology backward, i.e., to inversely estimate atmospheric conditions from the information of a flood on land surfaces. We will present our recent progress of an Observing System Simulation Experiment (OSSE) to evaluate how the assimilation of river discharge observations improves the skill of forecasting severe rainfalls and floods.

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