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Heavy Flood Discharge Prediction in Fukui Rainfall Disaster 2004 in Japan and Prediction in Ungauged Basin

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In 2004, 10 typhoons hit Japan and more than 200 people lost their lives by heavy rainfall disasters induced by the Bai-u front and the typhoons. In Japan, river improvements of class A rivers administrated by the central government have been well implemented for long years and disasters along class A rivers have much decreased; while the river improvements of small scale catchments with several hundreds square km managed by local governments are still quite low level.
In this research, we focus on the Fukui heavy rainfall disaster on July 18, 2004 in Japan, which was the largest flood in the Asuwa River basin with 351 km2; and discuss the issues to reduce flood disasters in small scale catchments. The research issues include:
• Analysis of statistical properties of heavy rainfall events of 2004 in Japan including the Fukui heavy rainfall disaster
• Prediction of heavy flood discharge using a state of the art distributed hydrological model, and
• Problems of the current river planning method applied to small scale river basins in Japan.
The Asuwa River basin has limited hydrological data; thus to predict the heavy flood which was two times larger than the highest flood recorded ever was a good test for prediction in ungauged basin. We tested a state of the art distributed hydrological model to predict the flood; and found that the predicted result was far from observed discharge. The reasons which cause the discrepancy between observed and predicted discharge was closely examined and we discuss the way to reduce the uncertainty and enhance the reliability of flood discharge prediction. The research implementation of PUB (Prediction in Ungauged Basin) and collaborations of working groups in PUB will also be discussed.