

Large flood prediction in poorly gauged basins: the 2004 largest-ever flood in Fukui, Japan

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Abstract In the Asuwa River basin in Fukui Prefecture Japan, the largest-ever flood since hydrological observations began, occurred on 18 July 2004. The severe rainfall front in the middle of July brought a heavy rainfall of 265 mm in six hours. The urban area of Fukui was heavily inundated due to dyke breaks along the Asuwa River; the upper parts of the Asuwa River basin were also severely damaged by flood and sediment disasters. When establishing flood control planning in Japan, obtaining a design flood estimated by using a rainfall–runoff model with a design rainfall having some exceedence probability is fundamental. However, the accumulation of hydrological data for estimating design floods is insufficient, especially in small-scale basins. In particular, information about large floods near or above the magnitude of a design flood is less available. In this study, we examine how well/bad the largest-ever 2004 flood in Fukui, Japan is predicted using a state of the art physically-based distributed rainfall–runoff model; then we discuss sources of flood prediction uncertainty and an approach for reducing the uncertainty and enhancing the reliability of flood discharge prediction.

Keywords prediction in ungauged basins; flood control planning; runoff model; PUB
