

Predictability of river water level, riverbed fluctuation and flood disaster pattern using ensemble weather forecast for 2016 Hokkaido heavy rainfall disaster

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During August 2016, Typhoon 10th has approach Hokkaido which caused record-breaking heavy rainfall. As a result of the event, upper stream area of Sorachi River Basin, Minamifurano city was inundated due to the overtopping levee at the upper reach and lower reach. In order to assess the flood risk of the event, all uncertainties should be take into account. The research aims to predict the possibility of river water level distribution, riverbed fluctuation distribution and flood disaster pattern beforehand. This is by using the weather forecast model which predicts the typhoon path possibility and its meteorological properties two days prior, then, using the data to calculate the rainfall-runoff distribution. Next, river water level, riverbed fluctuation, flood depth and flood area uncertainties can be predicted by using river flow calculation model. As a result, two days prior, not all ensemble's calculation result resembles the real flood disaster event. The ensembles typhoon path forecasts that pass through Aomori prefecture and Hokkaido prefecture had the possibility of flood occurring at the research area. Majority of the ensemble result were not flooded and also there are ensemble cases which inundated worse than the real disaster. Moreover, two days prior, there are 40% risk of inundation above 0.5 m. Thus, inundation possibility and also flood damages uncertainties two days prior of the event were assessed. In addition, relative frequency of the flood and flood area can be predicted prior of the event.