



Development of flood index by characterisation of flood hydrographs

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In recent years the world has experienced deaths, large-scale displacement of people, billions of Euros of economic damage, mental stress and ecosystem impacts due to flooding. Global changes (climate change, population and economic growth, and urbanisation) are exacerbating the severity of flooding. The 2010 floods in Pakistan and the 2011 floods in Australia and Thailand demonstrate the need for concerted action in the face of global societal and environmental changes to strengthen resilience against flooding.

Due to climatological characteristics there are catchments where flood forecasting may have a relatively limited role and flood event management may have to be trusted upon. For example, in flash flood catchments, which often may be tiny and un-gauged, flood event management often depends on approximate prediction tools such as flash flood guidance (FFG). There are catchments fed largely by flood waters coming from upstream catchments, which are un-gauged or due to data sharing issues in transboundary catchments the flow of information from upstream catchment is limited. Hydrological and hydraulic modelling of these downstream catchments will never be sufficient to provide any required forecasting lead time and alternative tools to support flood event management will be required. In FFG, or similar approaches, the primary motif is to provide guidance by synthesising the historical data. We follow a similar approach to characterise past flood hydrographs to determine a flood index (FI), which varies in space and time with flood magnitude and its propagation. By studying the variation of the index the pockets of high flood risk, requiring attention, can be earmarked beforehand. This approach can be very useful in flood risk management of catchments where information about hydro-meteorological variables is inadequate for any forecasting system. This paper presents the development of FI and its application to several catchments including in Kentucky in the USA, Oc-gok Basin in Republic of Korea and the haor region of Bangladesh.

Keywords: flood index, flood risk management, flood characteristics