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EMBANKMENT FAILURE MODELING USING THE *HR BREACH* MODEL

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Abstract

The HR BREACH model is a physically based numerical model for the simulation of breach initiation and formation through embankment dams, dykes, and flood embankments. The model is used for the analysis of homogenous as well as composite/zoned embankments. Simulation can also include the effect of surface protection such as grass or rock blocks. Two breach failure modes are available: failure by overtopping and failure by piping. Breach growth can proceed through surface erosion or head-cut erosion. This paper discusses the application of the model to three cases of physical embankment breaching tests. The results show the importance of the head cut erosion mode, the effect of surface protection with respect to accurate breach initiation time, and the implication of selecting the correct model parameters such as the discharge coefficient for weir flow. It was shown that in all cases the model predicted the outflow hydrographs reasonably well, while there were some challenges in predicting the observed breach width growth rate.

Key words: breach modelling, Embankment failure, head-cut erosion, the HR BREACH model

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