

## **Recent Improvements in Predicting Breach through Flood Embankments and Embankment Dams**

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**SYNOPSIS.** In the past decade a series of national and international initiatives have focused on understanding and improving the reliability of breach prediction. Breach prediction provides underpinning data for many types of flood risk assessment, including, for example, data for a dambreak analysis, a reservoir safety risk assessment, or for emergency planning. However, breach prediction remains one aspect of the overall risk analysis process that contains a high degree of uncertainty compared to other elements of the assessment. Uncertainty in breach prediction typically relates to a lack of understanding of the physical breach processes, the prediction methods available and their use, or misuse, within industry.

This paper provides an overview of current capabilities for predicting breach, from simple rapid methods through to more complex predictive methods. This review draws from experience gained through working on the EU FLOODsite project, the CEATI Dam Safety Interest Group breach modelling project, the more recent FRMRC2 programme and HR Wallingford company research work on breach prediction. The FRMRC2 programme work introduces a new simplified method for the rapid assessment of breach, whilst the HR Wallingford research introduces a new method for predicting breach through zoned embankments or dams.

Examples of where different methods are either appropriate or inappropriate are suggested along with an indication as to the future direction of research and industry model development for breach prediction.