

OVERVIEW OF EROSION PROCESSES WITHIN NWS-BREACH AND WINDAM

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Abstract Our ability to predict the rate of failure and resulting flood hydrograph of earthen embankments is crucial to evaluating risk to life and property. Prediction is dependent on our understanding of the erosion failure processes and our ability to model them. This presentation provides a description of the processes modeled within two process based models, the NWS-Breach model and SIMBA/WinDAM model. The presentation also discusses the algorithms used, the implications, and the relevance of each for embankment breach modeling.

Processes discussed are 1) destruction or removal of surface protection, 2) initiating mechanism, 3) erosion, and 4) shaping of volume eroded. While some similarities exist between the two models, the erosion processes modeled stand in stark contrast to one another. In the case of vegetal surface protection, similar processes are modeled, though our understanding and thus treatment of the failure process has become more sophisticated. Recent advances in our understanding of cohesive material erosion, since NWS-BREACH's introduction, have resulted in the development of a new approach to breach modeling that is formulated in the WinDAM model and is described.