

# Klein River Estuary (South Africa): 2D numerical modelling of estuary breaching

**JS Beck<sup>1</sup> and GR Basson<sup>2\*</sup>**

*<sup>1</sup> Department of Civil Engineering, University of Stellenbosch, Stellenbosch, South Africa (Presently at: MWH Ltd NZ, PO Box 12941, Auckland 1642, New Zealand)*

*<sup>2</sup> Department of Civil Engineering, University of Stellenbosch, Private Bag X1, Matieland, Stellenbosch 7602, South Africa*

## **Abstract**

2D numerical modelling of the breaching process of the Klein River Estuary in South Africa was carried out. The model was calibrated on field data and performs reasonably well, and is able to simulate the ebb and flood channels that form upstream of the mouth. The focus of the simulations was to determine the effectiveness of flushing of sediments during breaching, by investigating the breaching process at different water levels in the estuary, as well as at two different areas along the berm. Breaching at higher water levels increases the effectiveness of flushing as the discharge through the mouth increases significantly at higher water levels. Flushing towards the middle or south-east side of the berm is much more effective than towards the north-west side.

**Keywords:** estuary, breaching, Klein River, sediment flushing, numerical modelling