

## The shifting sands of coastal flood management in South Africa

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### 1 INTRODUCTION

Many South African estuaries are under threat of prolonged choking and closure of the mouth by marine sands because more and more of their natural freshwater supply is abstracted for human use. The predicted increases in sea level, and the enhanced severity and frequency of storms associated with climate change, mean that this threat will persist and increase. The choking and closure of the mouth in turn means that the estuarine environs are more vulnerable to catastrophic flooding as water levels become elevated during a flood event before mouth breaching can effectively reduce them. Whereas the coastal ecosystem may benefit from such flooding, the social and economic consequences can be devastating.

In this paper we do not examine the safety of these coastal systems and the vulnerability of estuaries to flooding from the usual engineering, environmental science or public administration perspective. Instead, we adopt a game theory and policy analysis lens and explore the evolution of policy in regard to flooding safety and estuary management in a novel way. We examine how actors involved in estuary management have influenced the conceptual basis of, and choices for, mouth breaching in association with artificial flood releases as the preferred management approach for a particular estuary, the Great Brak Estuary, from 1989 onwards (Slinger et al. 2005). We highlight the alignment of the concept underpinning the new South African national water and coastal policies with the estuary management choices made over the last twenty-five years. This enables us to distinguish four phases and identify the dominant justifications for current and past interventions. We explain the shifting sands of estuarine mouth breaching and flooding policy in terms of three game rounds.

### 2 METHOD

Following Finus (2001) and Wang et al. (2003), we view the policy process as an interactive decision process, where one party's decision is influenced by the actions of another party and vice versa. We draw information for casting the problem of flood safety and environmental management as a particular type of group decision problem from the following sources:

- i. extensive policy and project documentation, both published and in the grey literature;
- ii. an in-depth workshop with specialists and policy advisors involved in the design of the flood management strategies for the Great Brak Estuary from 1989 onwards; and
- iii. semi-structured interviews with state actors and citizens involved in the management of the estuary both in the past and the present.

