

# Biological responses to a resumption in river flow in a freshwater-deprived, permanently open Southern African estuary

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## Abstract

The Kariega Estuary is a freshwater-deprived system due to numerous impoundments in the catchment. This system has had little or no horizontal salinity gradient over the last 15 years, with hypersaline conditions sometimes predominating in the upper reaches. Following high rainfall events in the catchment during the spring of 2006, including a flood event (approximate 1:10 year) in August 2006, a series of riverine pulses entered the estuary and a horizontal salinity gradient was established. This study examined the influence of this freshwater pulse on four components of the biota within the estuary, namely the zooplankton, and larval, littoral and demersal fishes. The study demonstrated that in three of these components elevated densities were recorded following the riverine input, with only the littoral fishes retaining an almost constant density. In addition, changes in the relative contributions of the estuarine utilisation classes for all three fish groups examined indicated that freshwater input into these systems positively influences the abundances. This has significant implications for water managers as it demonstrates the importance of an Ecological Reserve (defined as ‘the water required to protect the aquatic ecosystems of the water resource’) for this system.

**Keywords:** biotic response, freshwater pulse, river inflow, Kariega Estuary