

South African estuaries: natural and anthropogenic drivers of ecosystem state

Rajkaran Anusha¹ and Janine Adams²

¹ Department of Botany, Rhodes University, PO Box 94, Grahamstown, South Africa
E-mail: A.Rajkaran@ru.ac.za

² Department of Botany, Nelson Mandela Metropolitan University, PO Box 77000, Port Elizabeth, South Africa, 6031

Estuaries are defined by Whitfield and Elliot (2011) as: 'a semi-enclosed coastal body of water which is connected to the sea either permanently or periodically, has a salinity that is different from that of the adjacent open ocean due to freshwater inputs, and includes a characteristic biota'. Ecosystem services derived from estuaries include introducing freshwater to the marine environment, a refugium and nursery for fish and invertebrates, carbon sequestration, flood regulation, storm protection, provision of safe bathing areas and the production of food, fuel and building resources. South Africa has approximately 300 functional estuaries classified into five types namely: permanently open, temporarily open closed, estuarine bays, estuarine lakes and river mouths. The main driver of ecosystem health is related to the quality and quantity of inputs from the riverine and marine environments into the estuarine body which influences the physical and chemical properties and in turn productivity in the water column and adjacent habitats. The mouth of an estuary links the marine environment to the estuary and allows for the movement of organic and inorganic components, this movement is important for both ecosystems. The National Biodiversity Assessment of 2011 identified freshwater flow reduction, habitat modification, fishing and pollution as major stressors and called for management interventions with regard to these. Mariculture and desalination are emerging pressures on estuarine biodiversity. The response of estuaries to these stressors is measured using the Estuarine Health Index which analyses the relationships between abiotic and biotic components. The health index has shown that, in South Africa, the large important estuaries were in a 'fair' to 'poor' condition. Estuarine specialists have developed and continually update an estuarine botanical database; the data has already been used in the management of estuaries in South Africa especially in National Biodiversity Assessment and estuary management plans. The National Estuary Biodiversity Plan (SANBI, Department of Environmental Affairs) has identified 133 priority estuaries to be assigned protection status in order to meet defined biodiversity targets. Although legislation is in place (National Water Act), effective estuary management must take place across different government departments which can represent a complex challenge. The Integrated Coastal Management Act strives to achieve this through cooperative governance and the development of estuary management plans which include all stakeholders. Estuaries provide a number of ecosystem services, the value of these are influenced by the factors mentioned above. Healthy estuaries are more likely to support habitats that may be more resilient to climate change. This presentation aims to summarise the role of natural and anthropogenic drivers on estuarine health and to evaluate the management tools in place in South Africa to protect the integrity of these important assets.