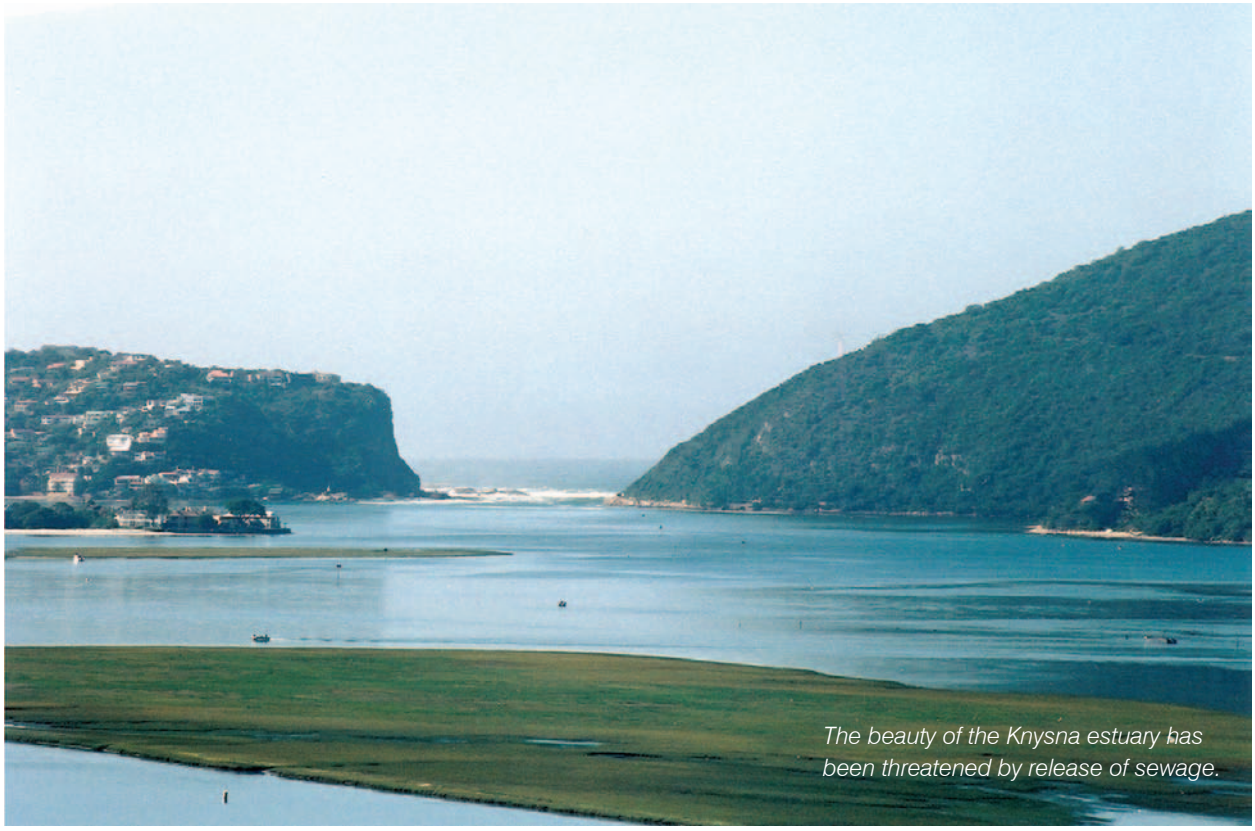
New Guide to Managing Valuable Resource

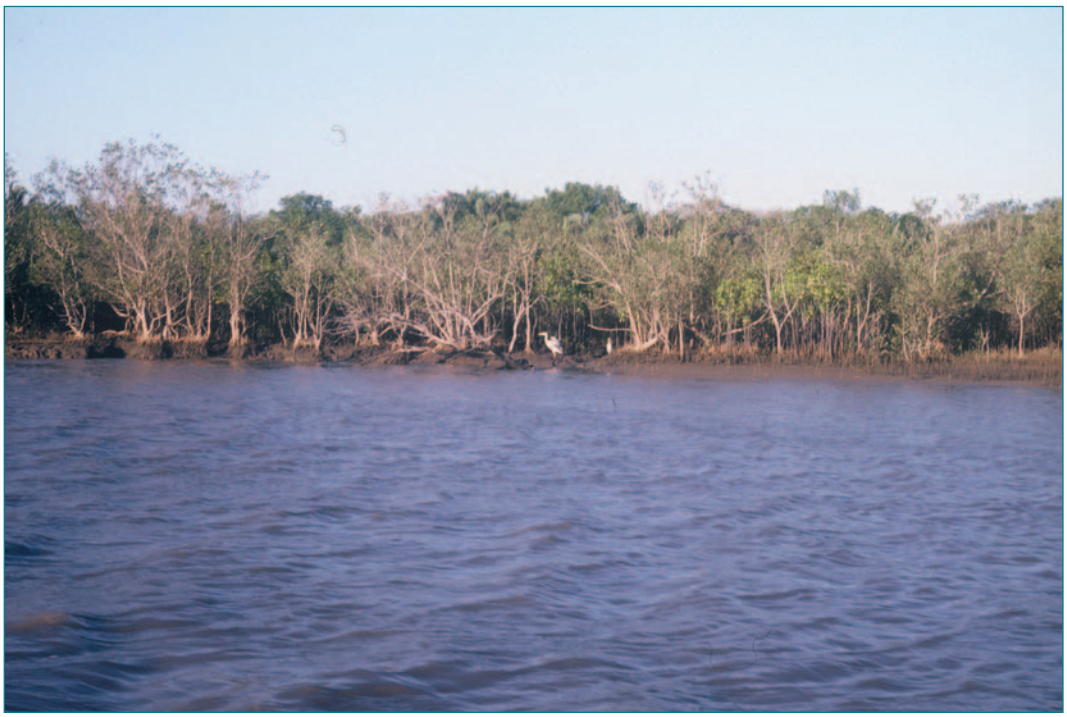
Estuaries have been recognised as one of the most valuable habitats on earth. Yet they are continually undermined by human activities that decrease their economic worth and threaten their existence. A new guideline published by the Water Research Commission (WRC) hopes to increase awareness among decision-makers about the socio-economic importance of South Africa's estuaries and to help them make informed decisions as to the sustainable development of these ecosystems.



The beauty of the Knysna estuary has been threatened by release of sewage.

There are more than 250 estuaries in South Africa, many of which are considered unique in terms of their physical characteristics and biodiversity. These estuaries perform several important ecological and economic functions, not the least of which is their aesthetic and recreational value. Among others they provide important nursery areas for many marine species thus making a significant contribution to inshore fisheries. They are also crucial conduits for the transportation of sediments and nutrients into the marine zone, where they contribute to marine ecosystem productivity. In addition, estuaries help to protect and control storm and flood damage.

However, despite existing laws that govern activities in and around estuaries, the overall protection of these valuable assets remains low. In fact, a recently published assessment of South Africa's national biodiversity shows that only 28% of the country's estuaries are considered to still be in an excellent condition (i.e. near pristine). A further 31% are in good condition, 25% in fair condition, with 15% of the country's estuaries being in a poor condition, which means



St Lucia is one of South Africa's most well known estuaries.

they suffer from major ecological degradation.

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This assessment, led by the South African National Biodiversity Institute, reports that the country's estuaries face a number of pressures, among others, habitat alteration (due to, for example, the construction of marinas and jetties), changes in mouth dynamics; overexploitation of estuarine resources; sedimentation and other problems in estuaries due to, for instance, abstraction of water from the catchment or poor bad catchment or mouth management; recreational disturbance and pollution (for example, the release of sewage into the Knysna estuary).

According to Dr Steve Mitchell, Director: Water-linked Ecosystems, at the WRC, the organisation started funding research into the conservation and sustainable use of estuaries because of these threatening activities. "These fragile, and often unique, ecosystems have huge potential to contribute to economic development, but are often inadvertently degraded because decision-makers and other stakeholders neither understand how these systems function nor have the know how to manage them appropriately."

A few years ago, an estuaries management programme, led by the Institute of Natural Resources in Pietermaritzburg, was set up in the Eastern Cape with funding from the WRC. Several projects have since been undertaken, the latest outcome of which is *Managing Estuaries in South Africa: A Step by Step Guide*.

Its objective is to assist decision-makers, consultants and stakeholders to manage estuaries in such a way that they contribute to socio-economic development without being irreparably damaged. Written in an easily understandable format, the guide explains the management process and gives advice on areas that can support this process. It also provides a series of tools or guidelines that can be used to assist in the management process for specific issues, including the sustainable use of living resources; biodiversity protection; rehabilitation and enterprise development. It also touches on estuary management at national and

WHAT IS AN ESTUARY?

An estuary is the meeting place of a river or lake system and the sea. Here, freshwater and seawater mix, water flow is influenced by the tides, wave action is reduced, and sediment and nutrients are deposited during normal conditions and eroded during floods. Unlike estuaries elsewhere, most South African estuaries are prone to closure by sand bars which block off the mouth for varying lengths of time.

One of the evaporator pans of a saltworks sited alongside the Swartkops estuary in the Eastern Cape, with high-density housing development coming right to the edge of the industrial development.

TYPES OF ESTUARIES

- **Permanently open estuaries**
  These include the Breede, Swartkops and Mlalazi estuaries. These are usually quite large systems with a perennial river and/or strong tidal exchange with the sea. Under low river flow conditions tidal exchange is sufficient to keep the mouth open.
- **Temporarily closed/open estuaries**
  These include the Groen, Van Stadens and Mhlanga estuaries. About 70% of South African estuaries fall into this category. These estuaries are often closed for many months of the year and sometimes for more than a year at a time. They usually have small catchments and limited penetration by tidal waters when they are open.
- **River mouths**
  These include the Orange, Mzimvubu and Thukela estuaries. All rivers flowing into the sea have a river mouth. However, estuaries under this category are usually permanently open to the sea. The river, rather than the sea, dominates the physical processes within these estuaries.
- **Estuarine lakes**
  These are, for example, Swartvlei, St Lucia and Kosi. These estuaries occur where a coastal lake is connected to the sea by a channel of varying length and width. The mouth of an estuarine lake can be either permanently open or temporarily open.
- **Estuarine bays**
  These include Durban Bay, Knysna and Richards Bay. These estuaries have wide mouths with strong tidal exchange resulting in a continuously open mouth, and the regular replacement of marine water in the lower and middle reaches. Even under high river flow conditions, seawater salinity persist in the bottom waters of the lower reaches as the less dense freshwater flows over the more dense seawater.

Source: Institute of Natural Resources

provincial levels; while introducing the reader to the laws regulating estuary use.

Much attention is given to cooperative management, i.e. getting a group of people with an interest in a specific estuary or group of estuaries together to plan and act in order to achieve certain goals related to those estuaries. The guide also strives to maintain a balance between estuary users.

"It is important to realise that our objective is not to dissuade authorities from developing estuaries, but rather to assist them to do so in a responsible, informed way," notes Dr Mitchell.

"Managers also have to realise when enough is enough. Many mistakes have been made in the past often as a result of the political and economic pressures placed on municipalities.

It has to be understood that limits to development on an estuary need to be set, for instance, how many jetties is one jetty too many. This guide aims to arm authorities with the relevant knowledge to make the right decisions whether to allow development of estuaries or not in a way that will stand when they are challenged."

"Estuaries are lovely places and we want to keep them that way," says Dr Mitchell. "This guideline provides the basis through which this can be done."

- To obtain a copy of *Managing Estuaries in South Africa: A Step by Step Guide* (Report No TT 243/04) contact Rina Winter or Judas Sindana at the Water Research Commission. Tel: (012) 330-0340, Fax: (012) 331-2565 or E-mail: publications@wrc.org.za.

- Other publications available from the WRC on estuaries are: *Towards the Conservation and Sustainable Use of Eastern Cape Estuaries* (Report No TT 237/04) and *Eastern Cape Estuaries Management Research Programme* (Report No 1246/1/04)

- Another useful publication on managing estuaries, *Managing Estuaries in South Africa: An Introduction*, is available from the Institute of Natural Resources, Tel: (033) 346-0796 or E-mail: inr@ukzn.ac.za or visit: www.inr.unp.ac.za.

- The South African National Spatial Biodiversity Assessment 2004 report can be accessed by visiting www.botany.uwc.ac.za/pssa/articles/features/no57.htm

The proliferation of jetties along the Swartkops estuary, in the Eastern Cape, as well as the ingress of marine sediment, which is reducing the volume of the estuary.