

Coastal and Estuarine Fishes and the Impact of Climate Change

By [FINSA reporter](#)



Port St Johns estuary. Photo: Stock

New research has found that the impact of climate change is having a profound effect on South Africa's coastal and estuarine fishes. According to the [National](#)

[Biodiversity Assessment \(2018\)](#), 27% of the 66 species assessed are threatened with extinction. In addition some 265000 waterbirds have been lost from South African estuaries since the 1980s.

Draft river estuary and mouth estuary management plans have been drafted for all estuaries in South Africa. The comment period closed on 4 March 2022.

Just in the Western Cape there are 54 estuaries and 38 micro-estuaries. The Western Cape Department of Environmental Affairs and Development Planning is responsible for 15 of the 29 draft EMPs that have been published for comment. CapeNature is responsible for 14 of the draft EMPs published.

These plans set out to co-ordinate and manage the various activities and impacts that occur within the estuarine functional zone. For prioritised estuaries, this could ultimately lead to declaring them protected areas or special management areas to protect specific habitat types found in these ecosystems.

The Director for Biodiversity and Coastal Management at DEA&DP, Marlene Laros, says: “The protection of our estuaries is not only

important for conserving the many fish, bird and animal species that call it their home but also from mitigating the effects of climate change.

“Estuary habitats, such as salt marshes, peatlands and wetlands, are considered “blue carbon” habitats and sinks, so when these ecosystems are damaged, an enormous amount of carbon is emitted back into the atmosphere which exacerbates global warming,” Laros says.

“They are also of immense economic and social value, being essential to fisheries, recreation and ecotourism,” she commented. Read about the [Berg Estuary Now a Wetland of International Importance](#) and this [Letter... Dead Fish Highlights River Estuary Vulnerability](#)

Draft EMPs can be viewed/downloaded online on DEA&DP website: <https://tinyurl.com/DraftEMPS>

In KwaZulu Natal [Traditional Fishing Communities Cast Out as Conservation Turns Commercial](#) and in the Eastern Cape read about [Where Kings Swim, or a 'Future of Opportunity'?](#)

Research

Professor Nikki James, Senior Scientist, National Research Foundation-SAIAB & Professor Warren Potts, Department of Ichthyology and Fisheries Sciences, Rhodes University, have written an article which has been published in *Science Matters* (February 2022).

The article titled "[*Climate change impacts on South Africa's coastal and estuarine fishes*](#)", notes that climate change in the coastal environment (estuaries and nearshore) is having profound consequences for marine species.

Citing various research papers, they say this is indicated by changes in temperature variability, increasing wind, ocean currents, rainfall, and other extreme weather events such as rising sea levels and ocean acidification.

In particular, extreme temperature ranges are affecting the egg and larval phase of fish in the subtidal marine environment.

Juvenile fish migrating to shallow nursery areas such as estuaries and rock pools where they grow before moving into deeper water as adults, seem to be able to tolerate higher temperatures.

However changing sea temperatures is affecting distribution of marine fishes as this is linked to subtidal sea surface temperatures and temperature tolerance during the subtidal larval phase.

The researchers note that is especially true for southern African mullet species (James et al. 2016).

Upwelling

Upwelling intensities have also increased along the south coast of South Africa. This is largely due to southerly winds driving cooler water from the deep towards the surface. The result is rapid changes in temperature which can often be lethal to fish.

[Marine Heatwave Causes Washup of Fish, Shellfish](#)

The increasing number of extreme events such as river floods, sea storms and drought, does not give fish communities in estuaries enough time to recover. Most affected is the fish fauna inhabiting intermittently open estuaries than those inhabiting permanently open estuaries.

An example given is the East Kleinemonde Estuary, where analysis of a 20-year dataset indicates that the abundance of most marine species declined in recent years as a result of an increase in the intensity and duration of floods and droughts, which affected the availability of subtidal habitat for fishes.

Lastly, fishing can alter the response of targeted species to climate change especially in marine protected areas where fish are more resilient to climate change-associated marine heat waves.

In conclusion, the authors say that it is important to understand the regional vulnerability of marine ecosystems and how climate change impacts fish biodiversity and the communities which rely on fish for food security.

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