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Department :

Economic Development, Tourism and
Environmental Affairs

PROVINCE OF KWAZULU-NATAL

DRAFT

KwaZulu-Natal Coastal Management Programme

The provincial policy directive for the
management of the coastal zone

2017 - 2022

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Cover Photo

Aerial view of the Thukela Estuary Mouth (Bronwyn Goble)

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FOREWORD

[To be included]

Acknowledgements

Project Team

The Provincial Coastal Management Programme (PCMP) for KwaZulu-Natal was prepared by the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) in collaboration with the Oceanographic Research Institute (ORI) (a division of the South African Association for Marine Biological Research). The project team was as follows:

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EXECUTIVE SUMMARY

Introduction

Coastal environments are a rich and diverse asset, providing valuable economic, social and ecological opportunities. As such they need to be carefully managed in order to ensure long-term sustainability. South Africa, following global trends, developed and enacted the Integrated Coastal Management Act (24 of 2008) and its subsequent Amendment Act (36 of 2014), hereafter referred to as the ICM Act.

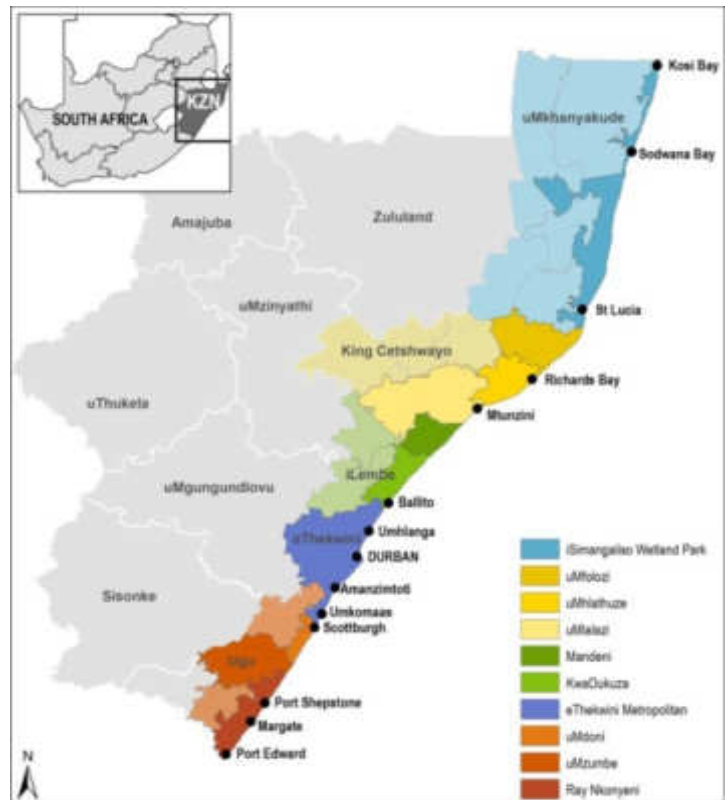
The ICM Act contains a variety of tools to ensure that the coastal zone will be managed co-operatively, of which the development of Coastal Management Programmes (CMPs) is key. A CMP is a policy directive for the management of the coast, and includes strategies and plans for the effective implementation of the ICM Act. The Provincial CMP (PCMP) sets out goals and objectives for the achievement of ICM in the Province. This PCMP has been developed in the context of existing policy documents for the Province and South Africa. Due consideration has been given to a number of national and provincial policies and plans, and the expertise of members of the KZN Provincial Coastal Committee (PCC), who served as a steering committee for this process.

Situation Assessment

The situation assessment provides a review of existing information on the KZN coast. It integrates current available information and gives an overview of the KZN coastal zone, its geography and climate, physical, biophysical and socio-economic characteristics. It also provides the context as to current ICM in KZN and gives an overview of current management concerns, such as coastal access, erosion and pollution. The situation assessment provides context about the current situation and management framework in order to inform ICM planning going forward.

Goals, Objectives and Actions

The vision for the KZN coast is based on the National CMP, the Province's Coastal Policy for KZN (2004) and the expertise of the Provincial Coastal Committee (PCC). The vision and mission are underpinned by a set of core principles which follow international best practice.



Map of KZN showing geographical demarcations

VISION FOR THE KZN COAST

A vibrant, healthy and safe coast with sustainable access to resources for all.

MISSION

Through co-operative governance and best practice the intrinsic value of the coast is protected, restored and enhanced for future generations, while promoting equitable access and sustainable use of coastal resources for all stakeholders and user groups.

KZN has identified nine priority areas for implementation of ICM under the CMP, each of which has a goal, a management objective, an action and a performance indicator attached to it. These together with the vision and mission provide the primary policy directive for coastal management in KZN.

Priority Area	Goal	Management Objectives	Action	Performance indicator	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022	
Coastal access	Promote safe and equitable access to the coast	Enable physical public access to the sea, and along the seashore, on a managed basis	Continue the management of public launch sites in KZN	Listing (gazetting) of public launch sites in KZN						
			Support to municipalities for the designation of coastal access land through undertaking a baseline coastal access assessment	Annual boat launch sites report						
				Baseline mapping of KZN coastal access						
				Verification of coastal access in KZN						
Coastal and marine planning	Promote balance between economic development and conservation of natural resources	Ensure coastal development is appropriate	Management measures and tools for development in the coastal zone	Best practice guideline for developing in the coastal zone						
		Protect the existing natural coastal environment	Identification of areas/zones (special management areas) for protection	List of priority areas/zones for protection (special management areas) provided to DEA						
Coastal information and research	Promote relevant research and access to information	Develop an appropriate information management and sharing system	Develop a public coastal information sharing portal	Live, interactive Information-sharing portal						
		Identify research priorities and opportunities in support of ICM	Develop a KZN coastal management research strategy	KZN coastal management research strategy						
Coastal vulnerability: adaptation and building resilient communities	Promote resilience to the effects of climate change, dynamic coastal processes and natural hazards	Ensure that coastal planning and development minimises the exposure of people, infrastructure and economic activities to significant risk from dynamic coastal processes	Develop coastal management lines (CML's) for KZN	Gazetted coastal management lines for KZN						
			Identify appropriate avenues to implement CML's	Framework for implementation of CML's						
		Facilitate rehabilitation of degraded natural coastal infrastructure, coastal ecosystems and habitats	Develop CML's for estuaries	Gazetted coastal management lines for KZN estuaries						
			Identify and prioritise hot spots for coastal rehabilitation in KZN	Identified hot spots for coastal rehabilitation						
Cooperative governance	Establish and strengthen institutional partnerships and mechanisms for ICM to facilitate better management	Promote provincial as well as local government objectives through participation in the National Coastal Committee (MINTEC Working Group 8)	Ensure formal nomination and representation at the NCC (MINTEC Working Group 8)	Official letter of nomination issued by Head of Department						
			Evaluation of relevant issues from Municipal Coastal Committees (MCC's) and the KZN PCC to NCC	List of evaluated issues elevated to Working Group 8						
		Strengthen and support Provincial and Municipal Coastal Committees	Formally appoint KZN PCC members	Official letters of appointment issued by MEC						
			Convene and record quarterly KZN PCC meetings	Records of quarterly KZN PCC meetings						
		Establish strategic PCC sub-committees with Terms of Reference specific to improve governance and ICM implementation.	Provincial representation and support to MCC's	EDTEA representative nominated for each MCC						
			Identify key focus areas in need of sub-committee support	Terms of reference for at least two sub-committees finalised and first meetings held						
Education, awareness and training	Develop capacity and promote public awareness and education for integrated coastal management	Build political and stakeholder support for effective coastal management in KZN	Develop and disseminate popular materials to support the implementation of the KZN PCMP	KZN PCMP summary distributed to stakeholders and politicians						
			Continue to produce an annual coastal newsletter for KZN (Ulwandle)	Annual coastal newsletter						
		Create general awareness about the coast and coastal issues in KZN, in order to change behaviour (linked to understanding & appreciating the value of the coast)	Roll-out interpretive and informative signage along the KZN coast	Number of interpretive and informative signage boards along the KZN coast						
			Needs analysis for ICM training in KZN	Annual needs analysis report developed						
Estuarine management	Undertake estuarine management which optimises the value of these systems on a sustainable basis	Ensure management of estuaries in accordance with the National Estuarine Management Protocol	Develop and disseminate popular materials to support the implementation of the KZN PCMP	List of priority estuaries for the development of estuarine management plans						
			Develop KZN estuary breaching policy	KZN estuary breaching policy						
		Develop estuarine management plan for the Kongweni Estuary	Develop estuarine management plans for the Tongati and Mahlongwa estuaries	Estuarine management plan for the Kongweni Estuary						
			Estuarine management plans for the Tongati and Mahlongwa estuaries	Estuarine management plans for the Tongati and Mahlongwa estuaries						
Long-term monitoring of estuaries	Visual assessment of estuarine status	A three-yearly report with annual updates								
	Physical monitoring of priority estuaries	A three-yearly report with annual updates								
Land and marine-based sources of pollution	Minimise the impacts of pollution and waste on the health of coastal communities and coastal ecosystems	Develop and implement water quality improvement programmes for prioritised coastal areas	Assessment of coastal water quality in KZN	Annual report of coastal water quality in KZN						
		Develop and implement pollution control measures using best practice	Support to the development of oil and hazard spill contingency plans for sections of the KZN coast not covered by existing plans	Oil and hazard spill contingency plans						
Monitoring, compliance and enforcement	Monitor the State of the Coast (SoC) and promote compliance with coastal and other regulations	Reporting on the state of the KZN coastal environment	Identification of indicators for State of the Coast reporting	List of indicators for State of the Coast reporting						
			Develop State of the Coast (SoC) Report for KZN	SoC Report completed						
		Long-term coastal monitoring	Develop a strategy for coastal monitoring and reporting	Provincial SoC monitoring and reporting implementation plan developed						
			Undertake aerial inspection surveys of the coastline	Reports on inspection surveys to inform compliance and enforcement						
Shoreline change monitoring	Annual data update report									

Implementation

Implementation of the PCMP is driven by the KZN Department of Economic Development, Tourism and Environmental Affairs. This includes commitment to meeting the priorities, objectives and actions outlined as well as various relevant national drivers such as the National Development Plan, the National CMP and Operation Phakisa.

The KZN coastal environment is unique and complex to manage. The PCMP is therefore intended to function as an integrative planning and policy instrument, guiding the management of a diverse array of activities within the KZN coastal zone, without compromising environmental integrity or economic development. In this context, however, the PCMP acknowledges the important role that MCMP's and the iSimangaliso Integrated Management Plan must play in managing the coastal zone at the local level. The PCMP further recognises the respective mandates of DAFF, DEA, DMR, DPW, DWS and Ezemvelo KZN Wildlife in contributing to the overall management of the KZN coastal zone.



**Dune erosion at Thukela Beach
(Bronwyn Goble)**



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Nymphaea - aquatic floating water lily
(Fiona MacKay)



LIST OF ACRONYMS

BLSMS	Boat Launch Site Monitoring System
CML	Coastal Management Line
CMP	Coastal Management Programme
COGTA	KZN Department of Cooperative Governance and Traditional Affairs
CPP	Coastal public property
CPZ	Coastal protection zone
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry & Fisheries
DEA	Department of Environmental Affairs
DM	District Municipality
DMR	Department of Mineral Resources
DPW	Department of Public Works
DWS	Department of Water and Sanitation
EDTEA	KZN Department of Economic Development, Tourism and Environmental Affairs
EEZ	Exclusive economic zone
Ezemvelo	Ezemvelo KZN Wildlife
GDP	Gross Domestic Product
HWM	High-water mark
ICM	Integrated Coastal Management
IDP	Integrated Development Plan
KZN	KwaZulu-Natal
LM	Local Municipality
MCC	Municipal Coastal Committee
MCMP	Municipal Coastal Management Programme
MPA	Marine Protected Area
NCMP	National Coastal Management Programme
NEMA	National Environmental Management Act
NRF	National Research Foundation
PCC	Provincial Coastal Committee
PCMP	Provincial Coastal Management Programme
RDLR	Department of Rural Development and Land Reform
SAAMBR	South African Association for Marine Biological Research
SALGA	South African Local Government Association
SAMSA	South African Maritime Safety Authority
SANCOR	South African Network for Coastal and Oceanic Research
SEA	Strategic Environmental Assessment
SoC	State of the Coast
SDF	Spatial Development Framework

GLOSSARY OF TERMS

- “Admiralty reserve”** Means any strip of land adjoining the inland side of the high-water mark which, when the ICM Act took effect, was state land reserved or designated on an official plan, deed of grant, title deed or other document evidencing title or land-use rights as admiralty reserve, government reserve, beach reserve, coastal forest reserve or other similar reserve.
- “Best Practice”** Is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to using the best practices in any field is a commitment to using all the knowledge and technology at one's disposal to ensure success.
- “Biodiversity Act”** Means the National Environmental Management: Biodiversity Act (10 of 2004).
- “Biodiversity” or “biological diversity”** Has the same meaning ascribed to it in the Biodiversity Act.
- “Coastal access land”** Means land designated as coastal access land in terms of section 18(1), read with section 26 of the ICM Act.
- “Coastal activities”** Means activities listed or specified in terms of Chapter 5 of the National Environmental Management Act which take place (a) in the coastal zone; or (b) outside the coastal zone but have or are likely to have a direct impact on the coastal zone.
- “Coastal environment”** Means the environment within the coastal zone.
- “Coastal management”** Includes - (a) the regulation, management, protection, conservation and rehabilitation of the coastal environment; (b) the regulation and management of the use and development of the coastal zone and coastal resources; (c) monitoring and enforcing compliance with laws and policies that regulate human activities within the coastal zone; and (d) planning in connection with the activities referred to in paragraphs (a), (b) and (c).
- “Coastal management line”** Means a line determined by an MEC in accordance with section 25 in order to demarcate an area within which development will be prohibited or controlled in order to achieve the objects of the ICM Act or coastal management objectives.
- “Coastal management objective”** Means a clearly defined objective established by a coastal management programme for a specific area within the coastal zone which coastal management must be directed at achieving.
- “Coastal Management Programme”** Means the national or a provincial or municipal coastal management programme established in terms of Chapter 6 of the ICM Act.
- “Coastal planning scheme”** Means a scheme that— (a) reserves defined areas within the coastal zone to be used exclusively or mainly for a specified purpose; and (b) prohibits or restricts any use of these areas in conflict with the terms of the scheme.
- “Coastal protected area”** Means a protected area that is situated wholly or partially within the coastal zone and that is managed by, or on behalf of, an organ of state, but excludes any part of such a protected area that has been excised from the coastal zone in terms of Section 22 of the ICM Act.
- “Coastal protection zone”** Means the coastal protection zone contemplated in Section 16 of the ICM Act.
- “Coastal public property”** Means coastal public property referred to in Section 7 of the ICM Act.
- “Coastal resources”** Means any part of - (a) the cultural heritage of the Republic within the coastal zone, including shell middens and traditional fish traps; or (b) the coastal environment that is of actual or potential benefit to humans.
- “Coastal waters”** Means - (a) the internal waters, territorial waters, exclusive economic zone and continental shelf of the Republic referred to in Sections 3, 4, 7 and 8 of the Maritime Zones Act (15 of 1994), respectively; and (b) an estuary.

- “Coastal wetland”** Means - (a) any wetland in the coastal zone; and (b) includes - (i) land adjacent to coastal waters that is regularly or periodically inundated by water, salt marshes, mangrove areas, inter-tidal sand and mud flats, marshes, and minor coastal streams regardless of whether they are of a saline, freshwater or brackish nature; and (ii) the water, the subsoil and substrata beneath, and bed and banks of, any such wetland.
- “Coastal zone”** Means the area comprising coastal public property, the coastal protection zone, coastal access land, coastal protected areas, the seashore and coastal waters, and includes any aspect of the environment on, in, under and above such area.
- “Competent authority”** Means a competent authority identified in terms of Section 24C of the National Environmental Management Act.
- “Cultural heritage”** Means any place or object of aesthetic, architectural, historical, scientific, social or spiritual value or significance.
- “Development”** In relation to a place, means any process initiated by a person to change the use, physical nature or appearance of that place, and includes - (a) the construction, erection, alteration, demolition or removal of a structure or building; (b) a process to rezone, subdivide or consolidate land; (c) changes to the existing or natural topography of the coastal zone; and (d) the destruction or removal of indigenous or protected vegetation.
- “Dumping at sea”** Means - (a) any deliberate disposal into the sea of any waste or material other than operational waste from a vessel, aircraft, platform or other man-made structure at sea; (b) any deliberate disposal into the sea of a vessel, aircraft, platform or other man-made structure at sea; (c) any storage of any waste or other material on or in the seabed, its subsoil or substrata; or (d) any abandonment or toppling at site of a platform or other structure at sea, for the sole purpose of deliberate disposal, but dumping at sea does not include - (i) the lawful disposal at sea through sea out-fall pipelines of any waste or other material generated on land; (ii) the lawful depositing of any substance or placing or abandoning of anything in the sea for a purpose other than mere disposal of it; or (iii) disposing of or storing in the sea any tailings or other material from the bed or subsoil of coastal waters generated by the lawful exploration, exploitation and associated off-shore processing of mineral resources from the bed, subsoil or substrata of the sea.
- “Dynamic coastal processes”** Means all natural processes continually reshaping the shoreline and near shore seabed and includes - (a) wind action; (b) wave action; (c) currents; (d) tidal action; and (e) river flows.
- “Effluent”** Means - (a) any liquid discharged into the coastal environment as waste, and includes any substance dissolved or suspended in the liquid; or (b) liquid which is a different temperature from the body of water into which it is being discharged.
- “Environment”** Means environment as defined in the National Environmental Management Act.
- “Environmental authorisation”** Means an authorisation granted in respect of coastal activities by a competent authority in terms of Chapter 5 of the National Environmental Management Act.
- “Estuary”** Means a body of surface water - (a) that is permanently or periodically open to the sea; (b) in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the body of surface water is open to the sea; or (c) in respect of which the salinity is higher than fresh water as a result of the influence of the sea, and where there is a salinity gradient between the tidal reach and the mouth of the body of surface water.
- “Exclusive economic zone”** Means the exclusive economic zone of the Republic, referred to in section 7 of the Maritime Zones Act (15 of 1994).
- “Gazette”** When used in relation to - (a) the Minister, means the Government Gazette; (b) the MEC, means the Provincial Gazette; and (c) a municipality, means the Provincial Gazette of the province in which the municipality is situated.
- “Harbour”** Means a harbour proclaimed in terms of any law and managed by an organ of state.
- “High-water mark”** Means the highest line reached by coastal waters, but excluding any line reached as a result of - (a) exceptional or abnormal weather or sea conditions; or (b) an estuary being closed to the sea.

- “Interests of the whole community”** Means the collective interests of the community determined by - (a) prioritising the collective interests in coastal public property of all persons living in the Republic over the interests of a particular group or sector of society; (b) adopting a long-term perspective that takes into account the interests of future generations in inheriting coastal public property and a coastal environment characterised by healthy and productive ecosystems and economic activities that are ecologically and socially sustainable; and (c) taking into account the interests of other living organisms that are dependent on the coastal environment.
- “Land unit”** Means a cadastral entity which is capable of registration in the deeds registry in terms of the Deeds Registries Act (47 of 1937).
- “Littoral active zone”** Means any land forming part of, or adjacent to, the seashore that is - (a) unstable and dynamic as a result of natural processes; and (b) characterised by dunes, beaches, sand bars and other landforms composed of unconsolidated sand, pebbles or other such material which is either unvegetated or only partially vegetated.
- “Local community”** Means any community of people living, or having rights or interests, in a distinct geographical area within the coastal zone.
- “Low-water mark”** Means the lowest line to which coastal waters recede during spring tides.
- “Marine Living Resources Act”** Means the Marine Living Resources Act (18 of 1998).
- “MEC”** Means the member of the Executive Council of a coastal province who is responsible for the designated provincial lead agency in terms of the ICM Act.
- “Minister”** Means the Minister responsible for environmental affairs.
- “Municipality”** Means (a) a metropolitan, district or local municipality established in terms of the Local Government: Municipal Structures Act (117 of 1998); or (b) in relation to the implementation of a provision of the ICM Act in an area which falls within both a local municipality and a district municipality, means - (i) the district municipality; or (ii) the local municipality, if the district municipality, by agreement with the local municipality, has assigned the implementation of that provision in that area to the local municipality.
- “Municipal Systems Act”** Means the Local Government: Municipal Systems Act (32 of 2000).
- “National Environmental Management Act”** Means the National Environmental Management Act (107 of 1998).
- “National estuarine management protocol”** Means the national protocol concerning the management of estuaries contemplated in Section 33 of the ICM Act.
- “National Water Act”** Means the National Water Act (36 of 1998).
- “operational waste”** Means (a) any waste or other material that is incidental to, or derived from, the normal operation of a vessel, aircraft, platform or other man-made structure and its equipment; and (b) excludes any waste or other material that is transported by or to a vessel, aircraft, platform or other man-made structure which is operated for the purpose of disposing of that waste or other material, including any substances derived from treating it on board, at sea.
- “Organ of state”** Has the meaning assigned to it in Section 239 of the Constitution.
- “Pollution”** has the meaning assigned to it in Section 1 of the National Environmental Management Act.
- “Port”** Means a port as defined in the National Ports Act (12 of 2005).
- “Prescribe”** Means prescribe by regulation.
- “Protected area”** Means a protected area referred to in section 9 of the Protected Areas Act.
- “Protected Areas Act”** Means the National Environmental Management: Protected Areas Act (57 of 2003).
- “Provincial lead agency”** Means a provincial organ of state designated by the Premier of the province in terms of Section 38 of the ICM Act as the lead agency for coastal management in the province.
- “Reclamation”** Means the process of artificially creating new land within coastal waters, and includes the creation of an island or peninsula, but excludes beach replenishment by sand pumping for maintenance purposes.

“Sea” Means (a) the high seas; (b) all coastal waters; and (c) land regularly or permanently submerged by sea water, including - (i) the bed, subsoil and substrata beneath those waters; and land flooded by sea water which subsequently becomes part of the bed of coastal waters, including the substrata beneath such land.

“Seashore” Subject to Section 26 of the ICM Act, means the area between the low-water mark and the high-water mark.

“Special management area” Means an area declared as such in terms of Section 23 of the ICM Act.

“Waste” Means any substance, whether or not that substance can be re-used, recycled or recovered- (i) that is surplus, unwanted, rejected, discarded, abandoned or disposed of; (ii) that the generator has no further use of, for the purposes of production, reprocessing or consumption; and (iii) that is discharged or deposited in a manner that may detrimentally impact on the environment.

“Wetland” Means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Sodwana Bay sunset
(Rose Palmer)



1.1 Background

The coast is a cherished environment within which ecological diversity, human activity and socio-economic influences are interdependent and interact (Goble et al., 2014). However, coastal zones worldwide have been among the most heavily exploited areas targeting their rich, diverse resources and development opportunities (DEA, 2014). The average population density of coastal areas is twice the world's average population density at about 80 persons per square kilometre, and it is predicted that the numbers will continue to grow substantially (Goble et al., 2014). Population growth increases the burden on coastal habitats and resources to meet social and economic demands (DEA, 2014). Simultaneously, coastal environments will be exposed to climate change with increased erosion, sea-level rise, intensification of tropical and extra-tropical cyclones, increased flooding and wash-over events (Goble et al., 2014).

The need for wise planning and the effective management of the coast has long been recognised, with decision makers developing policies and legislation aimed at better management of the coastal zone. Today, Integrated Coastal Management (ICM) is globally recognised and widely utilised as a strategy to improve management of the coast and its resources (Goble et al., 2014). South Africa, following global trends, recognised the need for dedicated legislation aimed at protecting the coastal environment (FAO, 2007). This led to a significant policy formulation process spanning several years, strongly supported by excellent scientific, socio-economic and technical information. The process commenced with a Coastal Policy Green Paper (1998), a White Paper for Sustainable Coastal Development (2000) and culminated in the Integrated Coastal Management Act (24 of 2008) and its subsequent Amendment Act (36 of 2014), hereafter referred to as the ICM Act. The ICM Act was promulgated at the end of 2009, thereby creating the need for a programme of implementation of this legislation.

The ICM Act contains a variety of tools to ensure that the coastal zone will be managed co-operatively, so that development is undertaken in a sustainable manner thereby protecting the coast's conservation status (DEA, 2014). The development of Coastal Management Programmes (CMPs) is one of the most powerful of these integrating instruments. A CMP is a policy directive for the management of the coast, and includes strategies and plans for the effective implementation of the ICM Act. CMPs have an important role to play in bringing together various spheres and sectors of government, the private sector and communities to aid in effective implementation of ICM. This ensures that the development and use of natural resources is done in the best interests of people and the economy, while being ecologically sustainable (DEA, 2014).

1.2 Value of our Coast

The coastal environment is a rich and diverse asset, providing valuable economic, social and ecological opportunities (DEA, 2014). It provides opportunities for employment, income generation, recreation and a quality living environment. Paradoxically this contributes to greater levels of human settlement in the coastal zone and associated pressure on resources.

The Gross Domestic Product (GDP) of KwaZulu-Natal (KZN) reached R 322.2 billion in 2012, equivalent to 16.6% of South Africa's total GDP, driven by two primary macro-contributors to the Province's economy: its ports and tourism, both intimately linked to the coastal and marine environment (van der Elst and Goble, 2014). The ports of Durban and Richards Bay together handle 63% of South Africa's sea cargo and more than 50% of vessel traffic. As the busiest port in Africa, cargo values flowing through the Port of Durban are estimated to have reached more than R160 billion per annum. Not only do the ports of Durban and Richards Bay underpin much of the KZN economy, they also stimulate and support high levels of employment associated with manufacture, sea trade and transport (Jones, 2014).

A second macro-economic driver is tourism, especially coastal tourism. In 2013, KZN welcomed approximately 8 million tourists, some 850 000 being foreigners (Department of Tourism, 2014). Of these visitors, three out of four is known to visit the coastal zone and undertake activities related to the coast, suggesting that coastal tourism spend in KZN is equivalent to around R9 billion per annum.

1.3 Context of Coastal Management Programmes

A CMP is a policy directive for the management of the coastal zone and plays an important role in bringing together various sectors of government, civil society and communities along the coast guaranteeing effective management of the coastal environment (DEA, 2014). Moreover, CMP's are required in terms of the ICM Act (Sections 46-47), which specifies the elements that should be addressed by the CMP. Accordingly, all spheres of government are required to establish and implement their own but matching versions of CMP's. For example, the Province needs to align its PCMP with the NCMP, while municipal CMP's must be consistent with the NCMP and the PCMP of the province in which they are located. In terms of the ICM Act the requirements of the "municipality" fall to the District Municipality (DM), unless the DM and the Local Municipality (LM) enter into an agreement assigning the implementation of any provision of the Act in that area to the LM.

This document follows on from the Coastal Management Policy developed for KZN in 2004 (DAEA, 2004) which was based on the National White Paper for Sustainable Coastal Development in South Africa published in 2000 (DEAT, 2000) and aligns with the National Coastal Management Programme (DEA, 2014). It sets out broad goals and objectives for coastal management in KZN and includes strategies and plans for the effective implementation of the ICM Act by organs of state. The primary objective of the CMP is to collect environmental, economic and political data that influence the sustainable utilisation of coastal resources, combining these into plans of action that will allow for a coordinated approach to coastal management (DEA, 2012).

1.3.1 The Importance of Coastal Management Programmes

Human impacts coupled with global climate change projections increase pressure on coastal environments. Furthermore, demand for coastal space and resources leads to conflicts and potential unsustainable use of resources. The aim of ICM is to reduce or eliminate such problems, so that social and economic benefits can be derived through sustainable development (Cummins et al., 2004).

ICM is seen to be a framework for the management of coastal areas, described by Sorenson (1993) as: providing a "policy direction and a process for defining objectives and priorities and planning development beyond sectoral activities. It adopts a systems perspective and multi-sectoral approach which takes into account all sectoral and stakeholder interests, and deals with economic, social as well as environmental issues".

In South Africa, ICM is underpinned by the ICM Act, which requires the coordinated and integrated management of the coastal zone by all spheres of government in accordance with the principles of co-operative governance. The ICM Act requires National, Provincial and Local governments to develop a CMP for the management of coast under their jurisdiction. CMPs are aimed at aggregating and combining environmental, economic, social and political factors that influence the sustainable utilisation of coastal environments and their resources into plan/s that provide a coordinated approach for coastal managers, practitioners, users and other interested parties (DEA, 2012).

1.4 Purpose of Provincial Coastal Management Programme (PCMP) for KZN

The PCMP for KZN sets out goals and objectives for the achievement of ICM in the Province. The programme must (in terms of Section 47 of the ICM Act) provide a provincial policy directive for the management of the coast through an integrated, coordinated, uniform approach to coastal management in the Province. It must also ensure consistency with the National CMP and the National Estuarine Management Protocol. This programme takes the unique and diverse qualities of the KZN coast into account through a situation assessment and identifies areas of concern which require attention.

The ICM Act requires that PCMP's include:

- A vision for the management of the coastal zone in the Province, including the sustainable use of coastal resources;
- The coastal management objectives for the coastal zone in the Province and for specific parts of the coastal zone;
- Priorities and strategies:
 - to achieve the coastal management objectives of the Province;
 - to assist in the achievement of the national coastal management objectives as applicable in the Province;
 - to develop estuarine management plans for estuaries in the Province; and
- Performance indicators to measure progress with the achievement of these objectives

1.4.1 Outcomes of the Coastal Management Programme

South Africa's ICM path has progressed in distinct stages, each with specific outcomes. The main outcomes have been the Green Paper, the White Paper, the Act and the NCMP. The next phase is this, the PCMP, which has as its overriding outcome the actual implementation of the Act at the provincial level, based on a number of primary underlying outcomes including:-

- The development of a KZN-specific CMP that translates national goals and objectives into provincial outcomes and reflects provincial priorities and areas for implementation within a well-structured and integrated framework for coastal management and decision-making.
- Collation of provincial needs and issues to formulate priorities, action plans and strategies.
- A baseline situational analysis relevant to KZN leading to a transparent monitoring and evaluation reporting programme.
- The development and smooth operation of a PCC to provide guidance, integration and decision support.
- Implementation of key activities in terms of national principles and provincial priorities within a standardised and uniform approach to coastal management within the Province, ensuring consistency with the National CMP and National Estuarine Management Protocol.
- Guidance on the development and alignment of municipal CMPs and associated outcomes.
-
- This PCMP updates and builds on the 2004 KZN Coastal Policy document and incorporates updated provincial policies and direction applicable to KZN. The CMP aims to facilitate a coordinated and integrated approach to coastal management by the various stakeholders whose activities impact upon the KZN coast.

1.5 The KZN Coastal Management Programme development process

This PCMP has been developed in the context of existing policy documents for the Province and South Africa. Due consideration has been given to a number of National and provincial policies and plans, including: Operation Phakisa, the National CMP, the White Paper for Sustainable Coastal Development in South Africa (2000), the National Development Plan, the Coastal Policy for KZN (2004) and the Provincial Growth and Development Plan (2030 vision). The expertise of members of the KZN Provincial Coastal Committee (PCC), who served as a steering committee for this process, was also taken into consideration.

The process followed is detailed in Figure 1. A first step, as a precursor to the development of this CMP, involved the Province undertaking a broad situation assessment study to highlight the status, value and uses of the KZN coast. This is in the form of an illustrated book that provides technical information to coastal managers about key elements and the value of the KZN coast (see *Ugu Lwethu – Our Coast: A profile of coastal KwaZulu-Natal*). Thereafter the PCMP was drafted and followed a number of steps towards stakeholder engagement and approval.

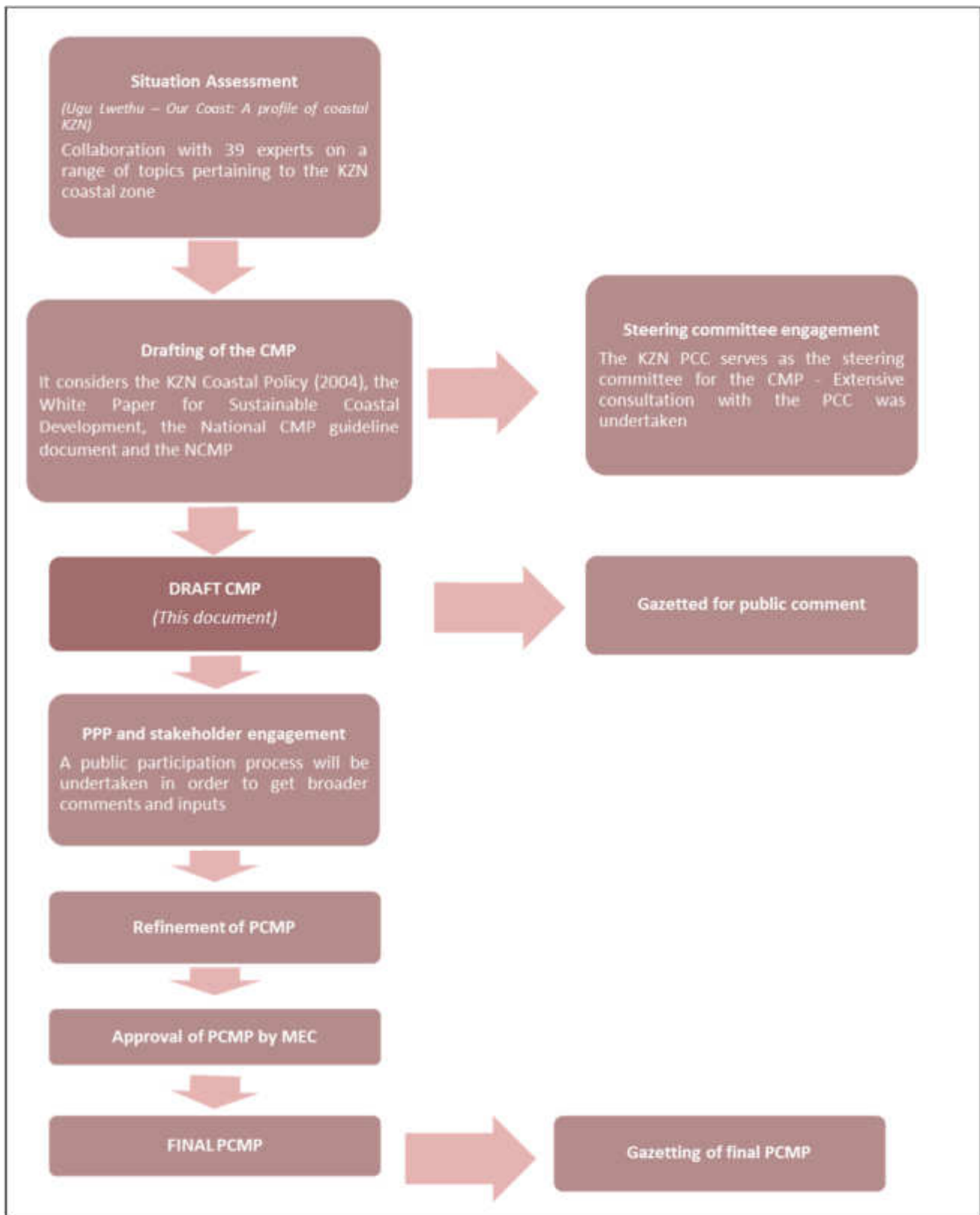


Figure 1: Process for the development of the PCMP

1.6 Framework for Integrated Coastal Management

The PCMP provides direction for coastal management in KZN over a five year period. The purpose of the PCMP is to interpret/translate national goals and objectives into provincial outcomes, provide guidance on the alignment of local/municipal outcomes and collate provincial needs and issues to formulate priorities, action plans and strategies (Kay and Alder, 2010).

Aerial view of Richards Bay Harbour
(Bronwyn Goble)



The following section provides an overview of selected features of the coastal environment of KZN and is especially designed to serve as a baseline against which to develop a management approach and to set action plans. However, a much more detailed and comprehensive review is that documented in the book: *Ugu Lwethu – Our Coast: A profile of coastal KwaZulu-Natal*, which readers are encouraged to consult (available by contacting the EDTEA).

2.1 The KZN coastal zone

The KZN coast is shaped by a unique assemblage of physical features comprising climatic, geological and oceanographic characteristics. Collectively they create a distinctive coastal environment rich in social, economic and ecological resources (Goble et al., 2014). The KZN coast stretches some 580 km from the Mozambique border, near Kosi Bay in the north, to the Mtamvuna Estuary on the border with the Eastern Cape Province in the south, and encompasses a range of physical environments. For management purposes the KZN coast is divided into five Coastal Districts, broken up into nine Local Municipalities plus the iSimangaliso Wetland Park Authority (Figure 2).

In terms of the ICM Act, the coastal zone is defined as “the area comprising coastal public property, the coastal protection zone, coastal access land, coastal protected areas, the seashore and coastal waters, and includes any aspect of the environment on, in, under and above such area”.

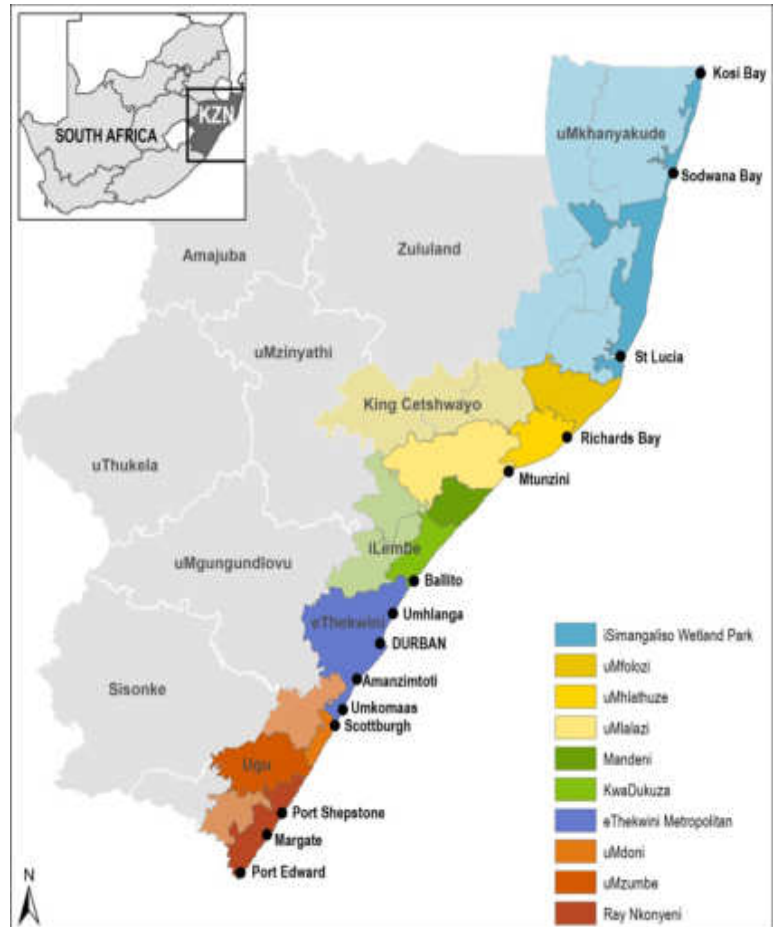


Figure 2: Map of KZN showing geographical demarcations

2.2 Geography

The KZN coastal zone is divided into five district management units, from north to south, uMkhanyakude, King Cetshwayo, iLembe, eThekweni and Ugu. Together they account for 32 423 km² of coastal lands and host a population of 6.35 million people, most in poverty, paradoxically despite the richness of KZN coastal resources. Each of these units face a set of challenges if they are to benefit sustainably from their coast. In particular, institutional capacity to regulate and monitor use of the coast, such as the impact of uncontrolled coastal development and pollution, needs to be strengthened.

2.2.1 uMkhanyakude District Municipality

The large uMkhanyakude District Municipality embraces 12,800 km² and is situated in northern KZN, within which the local municipalities of Mtubatuba, the Big 5 False Bay and uMhlabuyalingana, accounting for 58% of the area, have access to the coast. Its 200 km coastline extends from the Mozambique border and falls within the iSimangaliso Wetland Park and is rich in natural assets, with long sandy beaches, high forested dunes and broad coastal plains. Several rivers, coastal lakes, estuaries and wetlands support a great biodiversity including a wide variety of birds and large mammals. uMkhanyakude's economic strengths lie in tourism, with iSimangaliso attracting international and domestic tourists to the region. The economy is otherwise focused on rural subsistence activities. Pressures in the area include high levels of poverty, underdevelopment and a lack of infrastructure. Opportunities for its 630 000 population include small-scale agricultural development, offering prospects for supplementing incomes and creating jobs (DAEA, 2000). Improved beneficiation of coastal tourism should be possible.

2.2.2 King Cetshwayo District Municipality

The King Cetshwayo District Municipality of 8,200 km² is situated in northern KwaZulu-Natal, with the local municipalities of uMlalazi, uMhlathuze and uMfolozi having access to the coast. Almost 70% of the population of one million resides in these coastal areas, less than 20% urbanised. The district's main economic strengths lie in the port activities and associated industries of Richards Bay. Light and heavy industry, coastal mining, sugar-cane and timber are key focus areas of the formal economy. The district's infrastructure includes a moderately developed road network and airport facilities. Pressures include extreme poverty, high unemployment and lack of basic services. Rural activities such as subsistence agriculture and fishing are important to people of the region. Opportunities include further development of industry, mining, agriculture, forestry and nature-based tourism with community participation, providing a strong and sustainable economic foundation for the region (DAEA, 2000).

2.2.3 iLembe District Municipality

The iLembe District Municipality, embracing 3,260 km², is the smallest of the 11 districts in KZN, and is situated approximately in mid KwaZulu-Natal, north of eThekweni Municipality. Two of its four local municipalities have direct access to the coast: KwaDukuza and Mandeni. The population exceeds 610 000, 60% of which reside in these coastal municipalities. iLembe's economic strengths lie in the primary industrial development axis between Durban and Richards Bay. It has a strong base in agriculture, light industry, wood products, property development and tourism. The modern airport at La Mercy brings a growing number of visitors to the region while it also helps to drive a local trade zone. Despite its strategic location, iLembe faces numerous economic challenges such as high levels of poverty, which contrasts with rapid development along its coastal regions. This region has the Province's best prospects for attracting higher-income and international tourism, given careful environmental management (DAEA, 2000).

2.2.4 eThekweni Metropolitan

The eThekweni Metropolitan covers 2,297 km², having a 98 km coastline with 18 major catchments and 16 estuaries. Some 3.4 million people reside in this highly urbanised environment, many of whom are unemployed. Besides port activities, other economic drivers include tourism, recreational and leisure activities, manufacturing, commerce, financial services, and petrochemical and textile industries. Recreational harvesting of in-shore resources is an important feature while the accessible beaches attract large numbers of holidaymakers. Pressure as a result of urbanisation and industrial and commercial developments have raised serious challenges for the coastal environment. These include coastal pollution from industrial waste and shipping, disposing of domestic waste in rivers and canals and the location of petrochemical industries adjacent to residential areas. Nevertheless, this metro has considerable environmental management programmes in place, which include climate change issues. Infrastructure is insufficient to keep pace with the expanding population. Areas being considered for possible economic development include export industrialisation and trade growth related to the Dube Trade Port and expansion of the port's capacity.

2.2.5 Ugu District Municipality

The Ugu District Municipality which embraces 5,866 km² is situated to the south of eThekweni, with the local municipalities of Umdoni, Umzumbe and Ray Nkonyeni having access to the coast. Ugu's coastline of 122km has a large number of estuaries, rich rocky shores and sandy beaches making it a popular domestic tourist destination. Significant disparities exist between the former homeland region of KwaZulu and the former Natal area of the district; the latter endowed with many small towns and well developed infrastructure and services. In contrast the former KwaZulu is characterised by a large population, high unemployment, limited infrastructure and poor services. Indeed, 84% of Ugu's 710 000 residents are non-urbanised. Ugu's economic strength relies on seasonal leisure-based tourism and recreation. Although tourism infrastructure is well developed, this has not always occurred in a socially and environmentally responsible manner. Ribbon development and private ownership of land have limited equitable access to coastal resources. The coast continues to provide a modest but important source of food and other resources for local people. Ugu District Municipality's development strategies dictate that private investment along the coastline does not compromise equitable access or the visual aesthetics of the coastline.

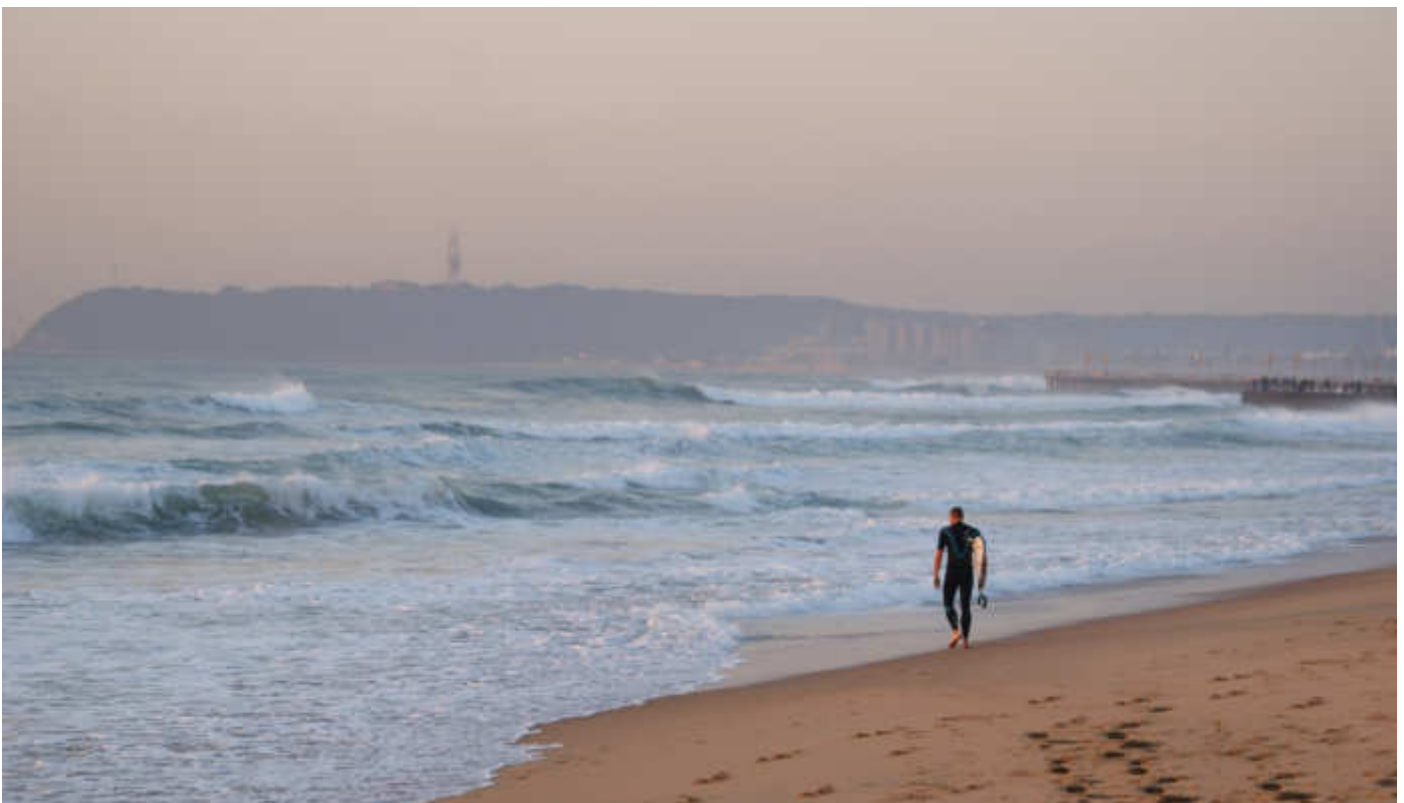
2.3 The physical coastal environment

2.3.1 Climate

The KZN coastal climate is moderate and can be described as ranging from warm temperate to sub-tropical. A relatively high rainfall regime prevails, mostly in summer, followed by an indistinct dry season in winter. The warm Agulhas Current is a major influencing factor that shapes the climate of the KZN coastal region, giving it its humid subtropical character (Kruger, 2014).

2.3.2 Wind

Coastal KZN is subjected to a moderate wind regime. During autumn and winter, winds from the southwest are dominant, while north-easterly winds dominate during spring and summer. Highest wind speeds are experienced during spring, with lower wind speeds usually recorded during winter. The strongest wind is commonly known as the "south-westerly buster", and is associated with the passage of a coastal low. Despite such peaks in wind, the average daily wind speed is only 14.7 Kph.



Surfer takes to KZN's warm coastal waters (Natalie Holland)

Extreme winds of very short duration also occur during the passage of a cold front, which is frequently accompanied by embedded thunderstorms. KZN experiences near weekly passages of mid-latitude weather systems, which are preceded by a coastal low pressure system. Winds first blow from the north-east, changing to mostly south-westerly as the coastal low passes. Very often, a period of warm north-westerly “berg” winds will intervene between the north-easterly and south-westerly winds. After the coastal low, a cold front moves over the area and generally cloudy and rainy weather is experienced. A high pressure system follows the front, pushing cooler maritime air along and over the coastline by the predominant south-westerly winds (Kruger, 2014).

2.3.3 Rainfall

The KZN coastal region receives about 1 000 to 1 200 mm of rainfall per year; places receiving more than 1 200 mm are not uncommon, especially along the north coast of the Province. While most of the rainfall occurs in mid-summer, the winter months are not completely dry. In KZN, about 28 days per year receive more than 10 mm of rain over a 24-hour period. Extreme rainfall events are associated with occasional “cut-off low” pressure systems that cool and trap excessive moisture.

While the region does experience tropical cyclones, their occurrence is infrequent. One of the most severe tropical cyclones to hit the region was Domoina, in January 1984, which caused the highest daily rainfall recorded in South Africa: 542 mm at St. Lucia (Kruger, 2014).

2.3.4 Temperature

The monthly average range of temperatures for the coast is between 11 to 28°C. Daily temperature highs average from 16 to 25°C in winter and 23 to 33°C in summer. Uncomfortably high “apparent” temperatures are common along the KZN coastal region, due to the frequent high humidity levels. Cold spells, defined as the number of consecutive days when the average daily temperature drops 5°C below the long-term average, are infrequent.

2.3.5 Sunshine and cloudiness

The amount of sunshine varies from 70% to 80% of the maximum during winter, to less than 50% in summer as a result of cloud cover. On average, more than 50 days per year can be classified as cloudy or overcast, while the number of sunny and fine days is usually around 240 per year. October and November are the cloudiest months, when about nine days per month receive 10% or less of the maximum possible sunshine.

2.4 Geology and Geomorphology

The continental shelf along the KZN coast is narrow, varying from a few kilometres wide at Kosi Bay to a maximum of 47 km off the Thukela River. The KZN coast is uniquely linear and its beaches are generally narrow and shallow, with bedrock occurring at less than 3 m below the surface of the sand.

The KZN coast can be readily divided into two geological zones, separated by the Thukela River. The southern section is made up of bedrock, with a thin cover of soft sediments and consists of a series of rocky headlands with intervening sandy beaches, often across the mouths of estuaries. The rocky hinterland of the southern coast rises steeply to the Drakensberg escarpment, allowing dozens of rivers to flow to the sea. The biggest sand accumulations occur in the embayments at the mouths of estuaries. Around Durban the coast comprises a major Quaternary dune complex, the Durban Bluff Complex. Wave refraction around the Bluff has formed a large zeta bay beach that extends from Durban Harbour to Umhlanga Rocks, which is now maintained by periodic artificial beach nourishment.

North of the Thukela River, the coast is composed of soft sediments and portrays a near-continuous sandy shore backed in part by high, forested dunes and locally developed fore-dunes. This section of coast is intercepted by a number of tidal rivers and inlets; with the river at Richards Bay having been modified to accommodate the port. Around the Port Durnford area, the coast is eroding into Quaternary dunes and the sediment is dispersed along shore. This erosion is creating high erosional bluffs, which are quite unusual in KZN.

2.5 Physical Oceanography

KZN has a relatively straight, northeast trending coastline, divided into gentle bays by short, low headlands or rocky outcrops. The coast is bathed by the warm waters of the Indian Ocean, with the strong Agulhas Current flowing in a south-westerly direction, transporting warm water polewards.

2.5.1 Bathymetry

The east coast continental shelf of South Africa is generally steep and narrow (6-12 km), and is relatively straight, apart from a section referred to as the KZN Bight, which extends approximately from St. Lucia in the north to Durban in the south. In this region there is an indentation in the coastline and the continental shelf widens to 47 km at its greatest extent, off the Thukela with a shelf-break at a depth of approximately 100 m off Durban and 90 m off Richards Bay. This bathymetry is an important controlling mechanism with regard to the path and features of the Agulhas Current (Guastella, 2014).

2.5.2 The Agulhas Current

Evidence suggests that the Agulhas Current originates off the northern KZN/southern Mozambique coast, from the confluence of waters that follow complex trajectories south of Madagascar and in the Mozambique Channel. The section of the Agulhas Current along the KZN coast falls within what is termed the northern Agulhas Current, which extends from approximately Kosi Bay to Port Elizabeth (Guastella, 2014).

The Agulhas Current waters are described as oligotrophic; this means that the open ocean waters are low in nutrients. However, riverine input contributes nutrients while various upwelling mechanisms bring cooler, nutrient-rich water from depth onto the shelf. Topographically induced upwelling caused by the Agulhas Current shearing from the shelf edge between St. Lucia and Richards Bay also brings this nutrient rich water from greater depths onto the shelf by a process known as Ekman veering. The St Lucia upwelling cell drives cooler water (18-19°C) and increased chlorophyll-phytoplankton concentrations inshore, and is an important source of nutrients and primary productivity for the KZN Bight (Guastella, 2014).

2.5.3 Tides

The KZN coastline is subjected to semi-diurnal tides, meaning that there are two high tides and two low tides per day. Along the KZN coast, the tidal range generally varies from 0.8 m during neap tides to 1.8 m during spring tides, with the highest astronomical tide (HAT) of 2.3 m for Durban. The tidal range is generally larger during equinoxes than during solstice periods.

2.5.4 Sea temperatures and salinity

Temperature and salinity are important features in evaluating the impact of climate change and global warming on ecosystems and biodiversity. Sea surface temperatures in the warm Agulhas Current vary seasonally from 22 to 28 °C, considerably warmer than inshore waters, which may drop to 18°C. While temperatures in the Current decline considerably with depth, there is no evidence of a persistent thermocline, suggesting considerable mixing. Related are the higher levels of salinity associated with the higher temperature regimes, except off larger rivers following land rainfall when localised salinity levels may drop by one-third.

Coastal development has in the past been inappropriately located, often too close to the high-water mark. This adversely affects the natural functioning of the coastal environment and often results in damage to, or loss of, the development as a result of coastal hazards, discussed in Section 2.7.5.

There are tracks of KZN coastal land, including former homeland areas, which remain untouched and these should be sustainably managed and in part be included in corridors for coastal conservation.

2.5.5 Wave and swell regimes

Oceanographic features of great consequence to the coastal zone are that of waves and swell height. Although the average wave height is 1.65 m, extreme weather events can create swell heights in excess of 10 m, invariably with waves that have great impact on the coast and infrastructure. Swells from the south-south-east predominate, especially in autumn, winter and spring when swells with a long periodicity are generated by passing cold fronts. Two other weather systems can cause extreme wave events along the KZN coast: tropical cyclones and cut-off low pressure systems. Although rare, tropical cyclones from tropical regions may reach KZN during summer, while cut-off lows can occur at any time of year. The effects of these increased swell heights are exacerbated with anticipated sea-level rise and when they coincide with spring and/or equinoctial tides, storm surges and low atmospheric pressure (Guastella, 2014).

2.6 Coastal and marine ecosystems

The KZN coastal environment is home to a range of ecosystems which support a high biodiversity with many species of commercial value providing food security and also a uniquely high level of endemism. These ecosystems include coastal and aquatic vegetation, sandy and rocky shores, transitional ecosystems such as estuaries, coastal lakes, mangroves and wetlands, and dynamic systems such as sub-tidal reefs and soft substrata.

2.6.1 Coastal vegetation and dunes

Temperature, wind, salt spray, moisture from rainfall and coastal mist are major factors affecting the size, density and structural complexity of the terrestrial plant communities along the coast of South Africa. There is a change as one moves around the coast from Namibia and up the southeast coast to KZN. The KZN coast shows the most complex of vegetation types, with taller trees and shrubs and an abundance of herbaceous layers, reflecting the more equable temperatures and higher and more consistent rainfall along this coast (Lubke, 2014). KZN coastal dunes are subject to change with the seasons and after storms, so that many of the coastal plant communities may disappear in a single storm event or gradually change in response to changing environmental factors. The coastal dune communities are often quite distinct, consisting of monospecific stands of pioneer plants, often cosmopolitan, especially those species that may be dispersed by ocean currents. In other cases there may be a graduation from the pioneers into thicket, so that the different communities are not obviously distinct (Lubke, 2014).



Coastal pioneer vegetation (Fiona MacKay)

Rocky shores differ from dune coasts in having stable substrata and shallow soils, and may be more exposed to high winds and salt spray (Lubke, 2014). Accordingly, vegetation along the rocky shores is invariably sparse and small in size. There may be an accumulation of saline water bodies with brackish streams in some sites where halophytic salt marsh plants may be found. The accumulation of sand on rocky shores may result in the establishment of pioneer species and communities common to the dune fields.

Threats to coastal vegetation and dunes

Coastal development places an increased demand on the goods and services provided by the coastal zone. Poor planning results in the loss of natural habitat and functioning of coastal vegetation and dunes, which in turn limits the coastal environments ability to deliver the very services and resources that attracted people to the coast in the first place.

2.6.2 Sandy Shores

Sandy shores are an important feature of the KZN coast, their value reflected in their ecological, economic and cultural importance. As most of the world's beaches are eroding, a unique feature of the KZN coast is the prograding shoreline at Mtunzini (Harris and Nel, 2014). From a conservation perspective the sandy shores of the iSimangaliso Wetland Park (northern KZN) are especially important as nesting grounds for threatened loggerhead and leatherback turtles. Several seabird species, including migrants, use beaches as foraging and/or roosting sites. Sandy shores in KZN represent a unique ecosystem that sustains a rich and characteristic fauna, ranging from minute meio- and macrofauna to the very prominent ghost and mole crabs. Sandy shores provide a number of valuable ecosystem services, such as water filtration, nutrient cycling and disturbance regulation by buffering heightened wave energy during extreme tides and storms. Beaches are highly-valued natural assets for recreational, cultural and traditional benefits. They also provide economic value through tourism and the extraction of natural resources for commercial and subsistence use (Harris and Nel, 2014).

The distribution of beach types along the coast falls into three zones. The near pristine northern section from Kosi Bay to Mapelane comprises beaches of the intermediate to dissipative state with some reflective beaches in places. Here, large and intact bi-directional parabolic dunes line the beaches, and include well-established coastal dune forests. Scattered among these vegetated dunes are buttress-reversing barchanoid dunes of bare sand. A mixed use central section from Richards Bay to Durban is mainly composed of intermediate beaches, with some reflective portions. A third, developed southern section from Durban to Port Edward has beaches that are predominantly reflective, fragmented along the shore by many rocky and mixed shores (Harris and Nel, 2014).

There are two major threats to the sandy shores of KZN: (a) habitat modification, primarily due to extensive coastal development and (b) sand starvation. In many cases, developments have been historically located too close to the shoreline, which leaves no room for the natural landward migration of the coast, and thus results in "coastal squeeze" – the gradual inundation and loss of sandy beaches. In addition, urbanised shores lose the natural barrier provided by dunes, which makes these developed areas vulnerable. The effect of the KZN coastal storm event of March 2007 was a classic example of this phenomenon (Harris and Nel, 2014).

There are a number of activities in the hinterland that have important downstream effects on beaches and dunes. In particular, damming of rivers, estuarine sand mining (see Section 2.7.1) and some agricultural activities have altered the supply and quality of sediment reaching the coast (Harris and Nel, 2014). Generally, the result has been a reduction in the volume of sand supplied to beaches and dunes, which contributes to erosion and further reduces the resilience of the coast to sea-level rise and storm impacts.

2.6.3 Estuaries

The KZN coast is endowed with 76 of the 300 estuaries found in South Africa. The profile of the coast, the subtropical climate and the nature of catchments all contribute to the characteristics of the different estuaries. Estuaries can be classified according to the way they were formed and how they function. Accordingly five types are recognised: 1) estuarine bays; 2) permanently open systems; 3) river mouths; 4) estuarine lakes; and the smaller but more numerous 5) intermittently open estuaries. The distribution and percentage of each of these types are shown in Figure 3. All five types occur in KZN, and vary greatly in size, depth, tide patterns, catchments, fresh water flows, salinity and types of sediment, which in turn influences the varieties of animals and plants that live there. Thus when it comes to managing estuaries it is seldom possible to adapt information from one estuary type to another. The classification or "typing" of estuaries is important for their management as different estuaries respond in diverse ways to change generated by human use or natural events (MacKay, 2014). While intermittently open estuaries predominate, estuarine lakes are only represented by two systems: St Lucia and Kosi. However, they account for 90% (365 km²) of the total provincial estuarine area of 400 km², which in turn is 66% of the national area, highlighting the importance of these two systems (MacKay, 2014).

KZN estuaries provide important life support to the coastal environment such as their nursery functions for numerous species of value. They also provide a wide range of benefits that support human endeavour through cultural, recreational and subsistence use. Healthy functional estuaries can lead to income generation and enhance the local economy of coastal areas.



Nhlabane Estuary – Intermittently open system (Bronwyn Goble) Thukela Estuary – River mouth system (Bronwyn Goble)

Threats to estuaries

Many KZN estuaries are vulnerable and under threat from direct and indirect pressures. Waste water often flows into estuaries where it can concentrate harmful chemicals, nutrients, herbicides, pesticides and pathogens. This can cause oxygen depletion leading to fish kills, algal blooms and a host of potential human health problems. South Africa is a naturally semi-arid country with pressing freshwater pressures to meet domestic, industrial and agricultural demands. But estuaries also need freshwater to function. The amount and natural timing of river water reaching estuarine and marine environments has often been altered through the construction of dams and direct extraction along the river course (MacKay, 2014). These changes affect the way an estuarine ecosystem functions and therefore may limit the services it provides.

Artificial breaching of an estuary results in a sudden and catastrophic lowering of water levels for aquatic plants and non-motile animals, which will disrupt natural functioning in the system. Such breaching may also prematurely release juvenile fishes, shrimps and other species into the ocean, thereby impacting their survival. Removal of natural vegetation in favour of crops, grazing or housing often leads to soil erosion and mud deposition into rivers and estuaries. With less water flowing into estuaries, normal flushing of accumulated sediments is reduced and

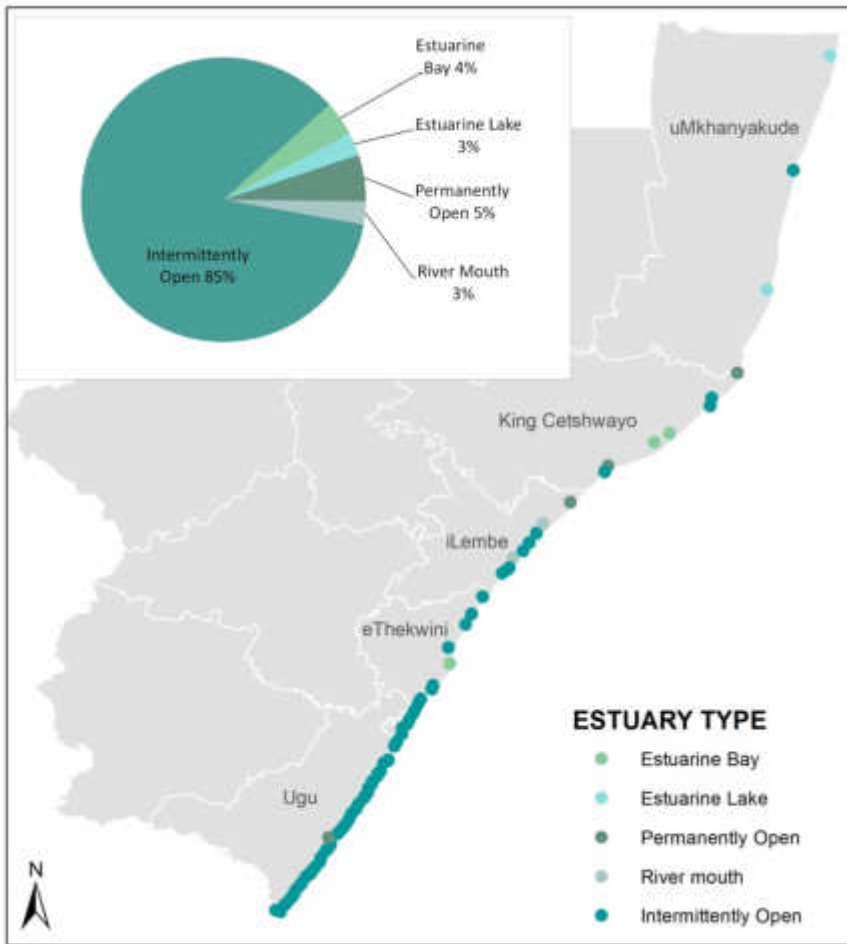


Figure 3: Types of estuaries found along the KZN Coast (Data from SANBI, 2011)

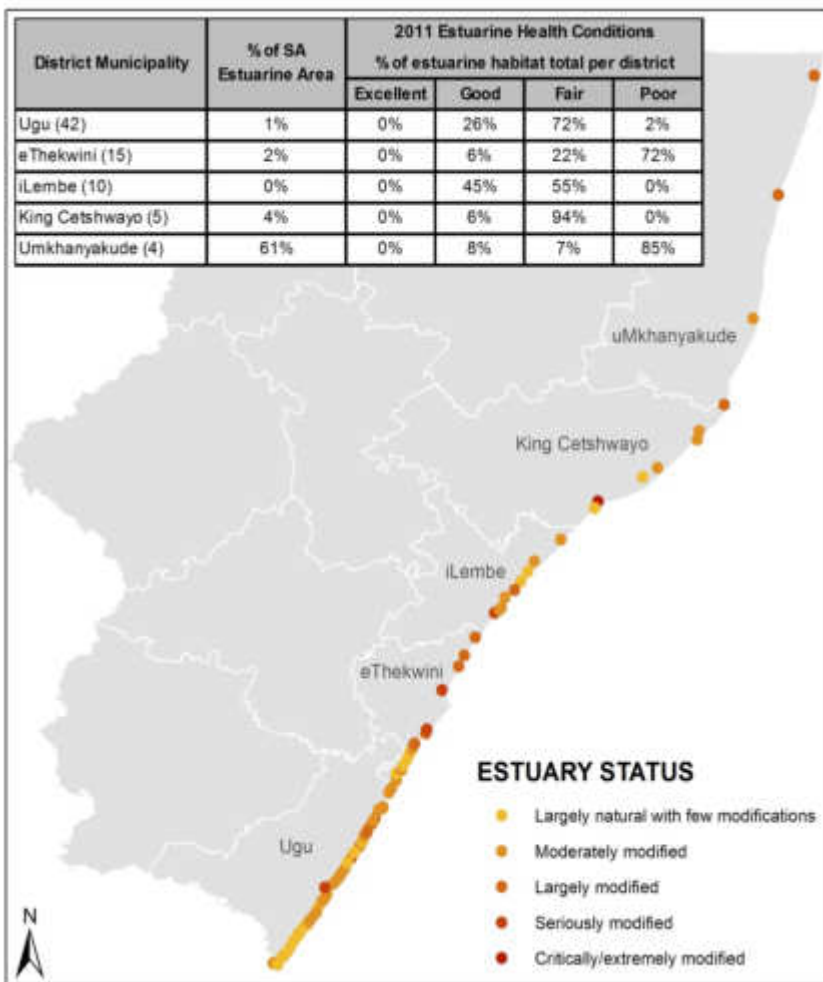


Figure 4: Status of KZN estuaries (Data from SANBI, 2011)



uMlalazi Estuary – Permanently open system (ORI)

habitats are lost as estuaries are too shallow. Irresponsible planning, design and placement of buildings, concreted embankments, jetties and bridges change water flow, cause erosion, loss of habitat and pollution in estuaries. Indirect effects of urbanisation such as the removal of sand for building can also have permanent and negative consequences on the ecology of the system (MacKay, 2014).

Further to these impacts, the National Biodiversity Assessment (2011) highlights that KZN estuaries are amongst those that will be the most affected by climate change from a structural and functional perspective, e.g. mouth state, nutrient supply, salinity distribution and ultimately production (Van Niekerk and Turpie, 2012).

State of KZN estuaries

According to the health evaluation of South Africa's estuaries in the National Biodiversity Assessment (2011), most of KZN's estuaries are in "poor" to "fair" health with none considered to be in an excellent state (Figure 4). At least 20 (27%) of the Province's estuaries are degraded. Sixty one percent of the country's estuarine habitat is found within the uMkhanyakude District on the KZN north coast (Figure 4), which equates to only four estuaries, namely: Kosi Bay, Mgobozeleni, St Lucia and uMfolozi; of which 85% of estuarine habitat is considered to be in a poor condition. This precarious state highlights the importance of the Estuarine Management Protocol and declaring a conservation protection status is one way in which estuarine degradation can be reduced so as to retain functional estuarine areas.

2.6.4 Coastal Lakes

Coastal lakes are mostly freshwater bodies that differ from estuaries in that they lack a surface water connection with the sea under present conditions. South Africa has two sets of coastal lakes; a group of five in the Southern Cape and a KZN series on the sandy coastal plain north of the Thukela River, including Sibaya, uMzingazi, Bhangazi and five others. Most of the KZN coastal lakes are set in sandy porous soils with little or no river input and sustained by a high surrounding water table; their waters are therefore clear and nutrient poor. Biological productivity is driven by vegetation, either emergent forms in surrounding reed-banks and marshes, or submerged and floating forms in their shallow sections, with the highest numbers of animals and most diverse communities occurring in marginal areas (MacKay et al., 2014).

The Zululand coastal lakes were originally estuarine and connected to the sea. However, the connection was lost with changes in sea level, creating freshwater lakes. Remarkably, in several cases, relics of marine fauna still occur, hence making these lakes quite unique. It follows that the biota of these lakes is also special and that several of these species are of conservation significance as recognised by IUCN and SA Red Data listings. This infers a potentially high conservation value of these systems and highlights the need for a management approach (MacKay et al., 2014).

Influences and threats

Because of the low productivity of these lakes they are sensitive to extractive use and water quality impacts. The naturally nutrient poor and clear waters are likely to be easily impacted by even moderate increases in nutrient loads, either from domestic or industrial effluent and agricultural runoff, changing the ecological nature of these unique systems. Similarly, activities surrounding these lakes that affect ground water need to be carefully managed (MacKay et al., 2014). Forestry and mining for example have the potential to markedly reduce groundwater inputs into these lakes. Invasion by alien plants and animals has long been recognised as a threat and this has proved true in recent years, particularly in systems near Richards Bay. Lakes here have also been impacted by the need for water to feed large-scale industrial and urban development. Construction of barrages at their outlets, built in order to increase fresh water yields has compromised connectivity in these systems, resulting in losses in fish communities and some crustaceans (MacKay et al., 2014).



Young fishers on the shores of Lake Nhlabane (Fiona MacKay)

The Zululand coastal lakes are places of aesthetic beauty and are increasingly valued as areas for tourism development. They also represent an important source of subsistence harvestable resources such as reeds and fish.

2.6.5 Mangroves

The South African mangrove forests grow exclusively in sheltered estuarine environments, occurring in 38 estuaries, 11 of which are in KZN. Since 1982 mangrove forests in KZN have increased in coverage by nearly 700 ha, attributed to sedimentation and the increase in available habitat for mangrove colonisation, especially the pioneer white mangrove in the uMhlathuze Estuary. The uMhlathuze River was canalised and a new mouth was constructed to compensate for the development of the Richards Bay harbour. This resulted in an increase in intertidal habitat which encouraged the spread of mangroves. Although there was an increase in the total area covered by mangroves, a recent survey revealed a decrease in the number of estuaries in which mangrove stands were found in KZN, from 22 to 11. These losses were attributed to land-use changes in agriculture, and to road infrastructure developments, most notably the N2 Freeway. The most impacted system has been in Durban Harbour, from which mangroves were physically removed during harbour construction, decreasing their area from 200 ha to just 15 ha (Adams, 2014).

2.6.6 Wetlands

Wetlands are formally defined by the National Water Act and the ICM Act as “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which in normal circumstances supports vegetation typically adapted to life in saturated soil”. Typically wetlands thus include riparian river banks, springs, marshes, bogs, floodplains, vleis, seeps and lakes (van der Elst and MacKay, 2014).

Wetlands have been considered the third most important life support system on earth. They can function as vast sponge-like reservoirs, filtering natural water thereby moderating both quality and quantity of water. They attenuate floods, reduce erosion, trap sediments, recycle nutrients, oxygenate the water and recharge groundwater. Besides their hydrological attributes, wetlands are especially important for regulation of water quality and flow to downstream estuaries, the trapping of silt to prevent smothering of downstream ecosystems and the bio-degradation of pollutants are but some examples (van der Elst and MacKay, 2014).

KZN is endowed with a number of wetlands that help to protect coastal ecosystems while delivering valuable environmental goods and services to diverse communities. Fortunately, many are protected and in good condition. Their continued functioning will depend on effective management and greater public awareness of the value of vleis, swamps, marshes and other forms of wetlands.

2.6.7 Rocky Shores

Rocky shores account for about 20% of the KZN coast and are mostly found on the southern and central coast. They are variably composed of dolerite, granite or sandstone and often display vertical zonation of marine life depending on physical stresses such as the extent of tidal inundation. Rocky shores in KZN span two biogeographical regions: the southern warm-temperate Natal bioregion, dominated by the brown mussel, and the northern subtropical Delagoa region, dominated by redbait and the Natal reef-worm. Rocky shore invertebrates are subject to high levels of subsistence and recreational harvesting while tidal and sheltered pools are important nursery areas, providing protection and food for juvenile fish, crustaceans and other forms of marine life (Steyn and van der Elst, 2014).

Threats to rocky shores include coastal development, which can lead to habitat loss and degradation. Waste discharges can lead to pollution where toxic contaminants are accumulated by filter feeding organisms such as mussels and oysters, and subsequently move higher up in the food chain. High levels of exploitation can pose a threat to species on rocky shores, both through disturbances and succession of biota. Furthermore, climate change and episodic events also impact rocky shore biota and sand inundation, and temperature extremes are of particular concern (Steyn and van der Elst, 2014).

2.6.8 Subtidal Reefs

The KZN coast has important subtidal reefs, with coral reefs located in the northern subtropical region. These are South Africa's only coral reefs and are thus critical marine habitats. Rocky reefs are scattered intermittently along the rest of the KZN coast. The coral reefs in South Africa are classified as subtropical and occur at the southern limits of coral distribution, only being found along the 150 km Maputaland coast from Kosi Bay to Leven Point. These coral reefs differ from tropical coral reefs in that they are on average deeper (9-30 m) and geologically younger. The benthic communities on the rocky reefs are characterised by more temperate species.

Subtidal reefs provide valuable ecosystem services. Shoreline protection, through the absorption of wave energy, is particularly important in light of climate change. The fish life found on these reefs is also diverse, with an estimated 500 reef-associated species recorded (Floros, 2014). This contributes significantly to the Province's economy through fisheries and tourism. For example, reefs at Sodwana Bay have a long history of attracting recreational fishers and scuba divers (Floros, 2014). Despite the immense value of these ecosystems, coral reefs throughout the world are being degraded as a result of human-related disturbances, with 20% of the world's coral reefs destroyed. Whilst KZN's coral reefs are situated within Marine Protected areas, they are still exposed to stressors such as climate change (coral bleaching and ocean acidification) and high resource use (recreational fishing and diving).

2.6.9 Subtidal Soft Sediments

Coastal and marine sediments, ranging from large gravel elements to fine muds, occupy over 70% of the seafloor and constitute one of the largest habitats on earth. This is a three dimensional habitat, due in part to its relatively unconsolidated nature as opposed to reefs, where biota is confined to hard, impermeable substrates (MacKay and Untiedt, 2014).

In KZN the most significant subtidal soft sediment habitat is found on the continental shelf between Richards Bay and Durban. This uncharacteristically wide shelf section, known as the Natal Bight, has been identified as being highly productive due to the influence of local oceanographic features as well as out-welling via the Thukela River. While most of the shelf area lies below the photic zone, the soft sediment environments support high species diversity. Small macrobenthic invertebrates (<1 mm) that live in the sediments are a dominant component. They promote decomposition, nutrient cycling and transferring energy to other food web components. In KZN on the inner shelf of the central Natal Bight (10-50 m), this ecosystem supports the only commercial, multispecies crustacean bottom trawl fishery in the country, the main targets being white, brown and tiger prawn (MacKay and Untiedt, 2014).

Habitat destruction occurs as a result of bottom trawling. Bottom-dwelling fauna can take up to five years or more to recover from this activity resulting in areas that never get a chance to recover to their natural state. Pollution effects can alter subtidal soft sediment ecology through eutrophication and even anoxia in shallow waters. Sewage effects on the seabed appear to increase productivity of animals there, but with time only hardy, tolerant species remain in sediments that become anaerobic.



Species found in or on the KZN seafloor (Fiona MacKay)

2.6.10 Marine Protected Areas (MPAs)

Marine protected areas are defined as “any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment” (IUCN). Also known as marine reserves or marine parks, they are important tools in the protection of marine biodiversity and to maintain productivity, especially of resident fish stocks. Once proclaimed, MPAs need to be managed if they are to achieve their stated objectives. The past two decades has seen a flurry of MPAs established around the world, although in reality many of these protected areas exist only on paper, with too few being effectively managed (Mann et al., 2014).

There are two large MPAs in KZN: iSimangaliso Wetland Park and Aliwal Shoal with a number of additional MPAs proposed under Operation Phakisa (Figure 5). In most cases the MPA is zoned so as to restrict certain types of usage. However, too few have “no-take” or “sanctuary” zones where 100% protection is in place. Such zones are important in achieving the overall goals of MPAs in terms of biodiversity protection and fisheries management. The MPAs of KZN are formally gazetted by National legislation but managed by the Province’s Ezemvelo KZN Wildlife (previously Natal Parks Board) which has a long history of conservation management. Assessment of the state of MPA management in South Africa shows KZN's MPAs to be well managed, although improvements in design, implementation of management plans, socio-economic considerations, staff capacity and monitoring need attention.

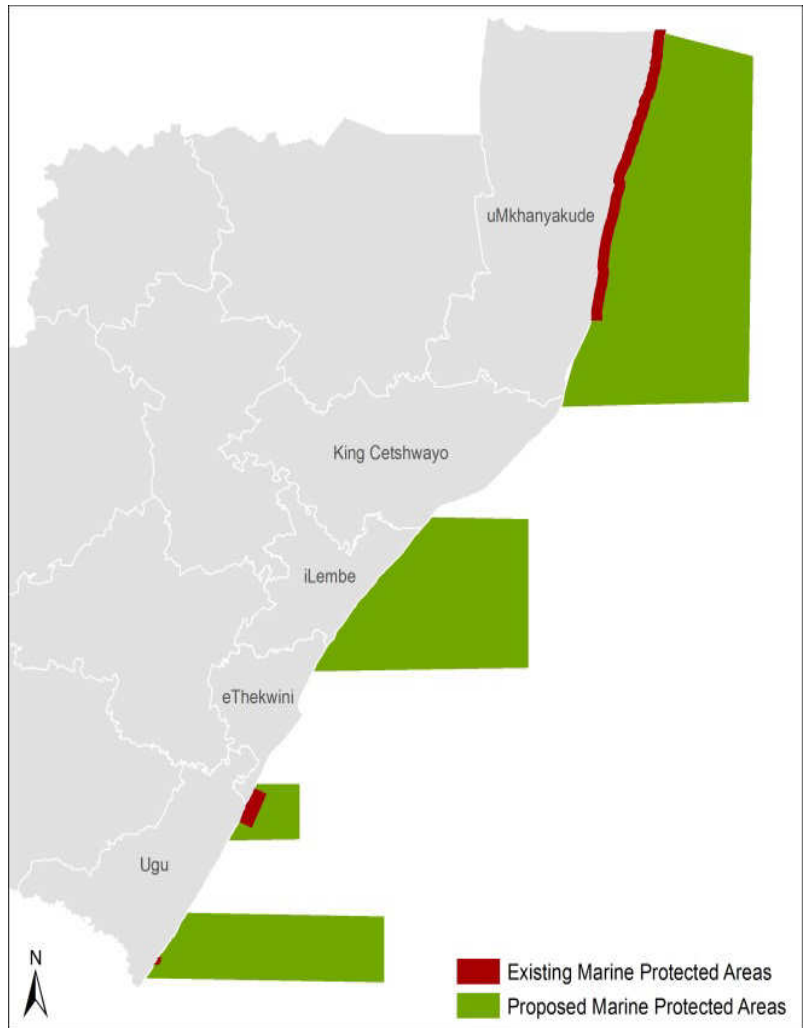


Figure 5: Current and Proposed MPAs in KZN

2.7 Socio-Economic Considerations

2.7.1 Coastal Economy

A healthy coastal zone provides many opportunities for employment, income generation, recreation and a quality living environment, all cherished attributes of human development, especially economic wealth generation. The KZN coastal zone is particularly endowed with economic opportunities. In 2012, the GDP of KZN was equal to 16.6% of South Africa's total GDP, despite having only 7.7% of South Africa's land area. Significantly, two primary macro-contributors to the Province's economy are its ports and its tourism, both intimately linked to the coastal and marine environment. In addition there are a range of smaller but collectively significant economic opportunities uniquely associated with the coast.

It is now widely acknowledged that ecosystem goods and services represent a greater but often less appreciated economic asset. For example, the *provisioning* of food, the *regulating* of climate and waste, *cultural* societal benefits and the *supporting* role of habitat structures, are all services provided by the KZN coast (Millennium Ecosystem Assessment 2005).

Maritime transport

The Ports of Durban and Richards Bay underpin much of the KZN economy and thereby stimulate and support high levels of employment in the coastal zone associated with manufacture, sea trade and transport. Together they handle 63 % of South Africa's sea cargo and more than 50% of vessel traffic, and as the busiest port in Africa, cargo values flowing through the Port of Durban are estimated to have reached more than R160 billion per annum. Notwithstanding their intrinsic value, ports have high environmental impact, are located in the fragile coastal zone, and invariably in an estuary or lagoon system. This calls for an integrated approach to management of such important zones.



A catch during the KZN Sardine Run (Fiona MacKay)

Tourism

A major driver of the coastal economy revolves around tourism, domestic and foreign. As a holiday destination the KZN coast is unmatched and draws more than 6 million visitors annually. Besides surfing, swimming and more passive beach activities there are many tourist pursuits that depend on the Province’s marine biodiversity including recreational angling, harvesting of shellfish, and non-extractive activities such as scuba diving, whale watching and shark encounters. The annual Sardine Run typically draws thousands to the coast and generates significant localised revenue. Scuba diving is very popular at Sodwana Bay, Aliwal Shoal and Durban, with almost 150 000 dives logged annually and generating local revenue. The towns of Scottburgh, Umkomaas and Park Rynie are examples where diving and shark encounters substantially support the local economy (van der Elst and Goble, 2014). Coastal tourism in KZN generates around R9 billion per annum. However, as the tourism market grows and coastal development increases, authorities should be mindful of balancing the expansion of coastal tourism with environmental sustainability.

Agriculture

Agriculture is an important contributor to the coastal KZN economy, mainly via sugarcane and commercial afforestation and to a lesser extent fruits and nuts. Sugar cane generated a gross turnover of R3.6 billion in the coastal zone in 2011 (Table 1), contributing significantly to the Province’s GDP (Sugden, 2014). However, over the period 2000 – 2010, there was a decline of nearly 50 000 ha of land under sugar cane cultivation, largely attributed to changes in land use with new residential and industrial developments in the coastal zone (Sugden, 2014).

Table 1: Sugar cane cultivation (2000 vs 2010)

Mill areas: KZN Coastal Zone	Area under cane (Ha) in 2000	Area under cane (Ha) in 2010	Average annual production (Million tons cane)	Average gross turnover (Rm – 2011 value)
Umfolozi	20 393	20 245	1.08	361
Felixton	37 799	29 927	1.82	605
Amatikulu	51 671	40 694	1.67	555
Darnall	31 165	25 658	1.14	380
Glenhow	22 529	30 321	1.11	369
Maidstone	39 838	22 975	1.26	419
Sezela	45 004	38 778	1.83	609
Umzimkulu	29 469	26 271	1.10	367
TOTAL	278 048	234 869	11.01	3 665

Mining

Historically, mining has been a key economic driver in South Africa, given the abundance of mineral resources, although its relative contribution to the total GDP has decreased progressively from 20% in 1970s to 9%. In KZN mining contributes about 2.3% to the Province’s overall GDP (Oellermann, 2014). Heavy metals are extensively mined in the KZN coastal zone, especially titanium, ilmenite, rutile and zircon extracted from dunes around Richards Bay. Here, about one million tons of titanium slag is produced annually by dredge mining, a technique whereby the coastal dunes are stripped of vegetation, and a large, shallow pond is excavated and filled with fresh water to accommodate a dredger. While these mines are a huge economic asset and employ thousands, there are environmental concerns about the impact of destroying these ancient dune systems.

A key mining activity is that of sand mining in many of KZN’s estuaries. A study in 2007 found a total of 60 mining operations in 18 estuaries (Table 2), predominantly in the larger river systems but also in estuaries from three classifications types: river mouths, permanently open and intermittently open systems (see Section 2.2.5) (Demetriades, 2007).

Table 2: Estuaries (north to south) in KZN which show evidence of sand mining pressure (Aug 2006 to Aug 2007).

Estuary	Mining operations	Estuary	Mining operations	Estuary	Mining operations
Thukela	1	Mbokodweni	8	Fafa	2
Mvoti	8-10	Manzimtoti	1	Mtwalume	2
Mhlali	4	Lovu	8	Umzumbe	3
Tongati	2	Umkomaas	8	Mzimkulu	5
Mdloti	3	Mahlongwa	2	Mbizane	1
Mgeni	5	Mpambanyoni	1	Mpenjati	2

Operation Phakisa has identified the marine and coastal environment as a growth area for oil and gas exploration. KZN’s coastal waters are included in the proposed exploration whereby 25% of the EEZ exploration rights in South Africa have already been granted, 10% have technical co-operation permits and a further 60% are under application (Figure 6). A key coastal management challenge is to achieve a balance between conservation, exploration and mining.



Dune mining near Richards Bay (Bronwyn Goble)

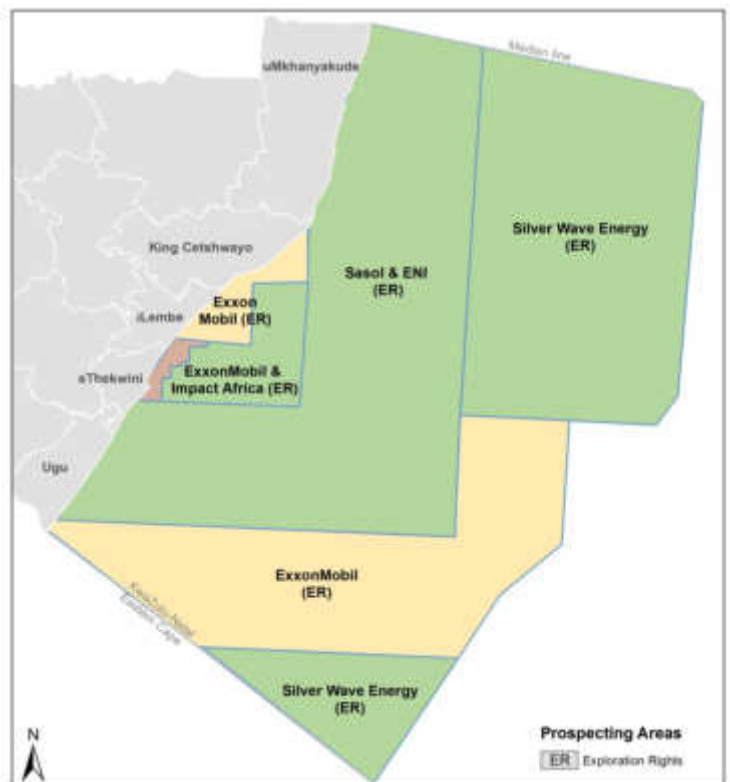


Figure 6: KZN mining and prospecting rights over the EEZ

Aquaculture

There is renewed government interest in fish farming along the KZN coastline. Currently, there is cage-culture of kob within the Richards Bay harbour as well as land-based kob farming activities at the Umlalazi Estuary.

The DEA in collaboration with the DAFF has commissioned the undertaking of a Strategic Environmental Assessment (SEA) for aquaculture development in South Africa, including coastal KZN. This SEA forms part of Operation Phakisa and is aimed at promoting and supporting the sustainable growth of the aquaculture industry.

In spite of the renewed interest in aquaculture in coastal KZN, new initiatives need to learn from the inappropriate selection of species in the past. As an example, the farming of exotic species resulted in the unintended spread of pathogens and alien species.

Offshore aquaculture ventures are precluded along the KZN coastline due to the dynamic, high energy nature of the coast and the lack of sheltered embayments.

2.7.2 Coastal population and settlement patterns

Worldwide, approximately 40% of the population resides within 100 km of the coast: those who don't enjoy that privilege often make great efforts to visit the coast. South Africa mirrors that trend and in KZN the figure is especially high, at almost 60% of the Province's population (Figure 7). The coastal environment provides a great many opportunities for employment, income generation, recreation and a quality living environment. South Africa's population reached an estimated 51.7 million in 2011, with 20% (10.3 million people) living in KZN (Statistics South Africa, 2012), of which an estimated 52% live within the coastal local municipalities. There is a nett migration of people from inland areas to coastal cities and settlements, and it is estimated that between 2001 and 2011 more than 250 000 people moved to and settled in KZN.

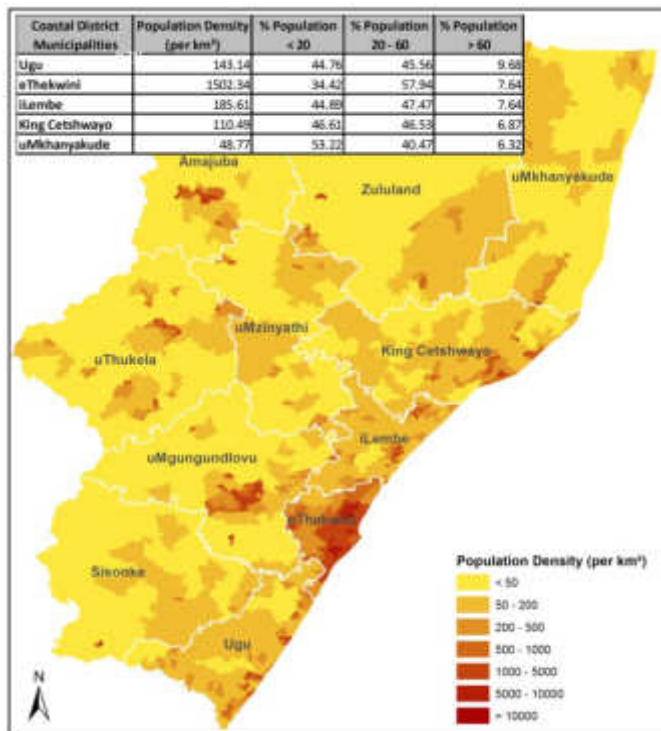


Figure 7: Population density of KZN

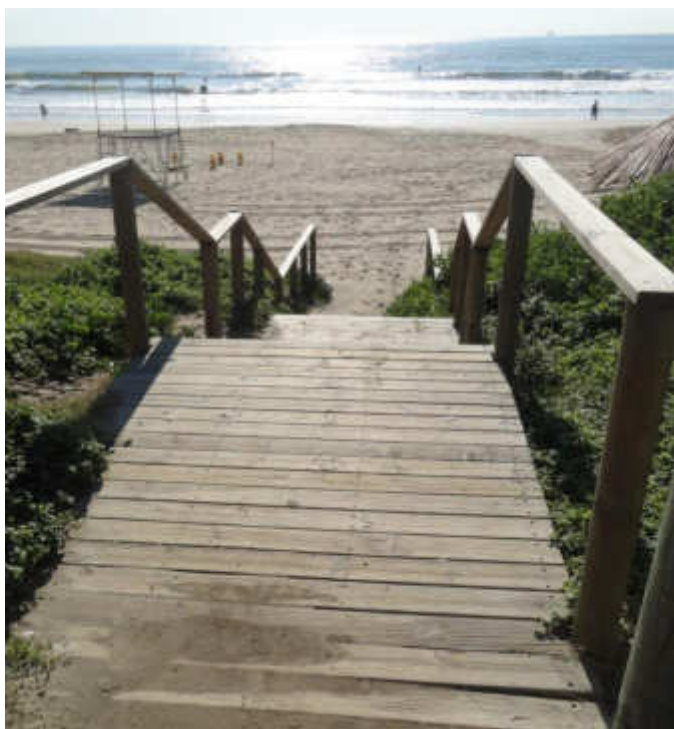
2.7.3 Coastal Access

The coast has economic, cultural, historical and spiritual significance to the people of KZN. Thus it is important that access to the coast be maintained and where necessary, improved. In addition, coastal access provides opportunities for economic development, extracting resources, recreation, education and overall improvement of both mental and physical health. Coastal access land is defined in the ICM Act as “land designated in order to secure public access to coastal public property”. This includes the provision of public amenity and associated facilities such as parking areas, public toilets, boardwalks and skiboat launch sites. The ICM Act presents a strong mandate on the equity of access and utilisation of the coast and its resources by all South African citizens.

On average, the Province has two public access points per one kilometre of coastline, with density increasing from north to south (Janse van Rensburg & Goble, 2014). The majority of these access routes are informal pedestrian pathways covered by grass or sand, with only a small number of hard-surfaced, formal routes capable of providing vehicle access to the beach (Figure 8). Illegal coastal access pathways from private property, especially along the KZN South Coast, remain a challenge.

For many years, the use of off-road vehicles such as 4x4s and quad bikes in the South African coastal zone was subject to little or no regulation. While this assured access to the coast for some users, it resulted in damage to coastal ecosystems. Accordingly, the Control of Vehicles in the Coastal Zone Regulations (No. 1399 of 2001) was enacted in January 2002 under NEMA. These regulations, since updated and promulgated in terms of the ICM Act, prohibit the driving of motorised vehicles within the coastal zone except for reasons including emergency, health and safety. Since the beach-driving ban came into effect, there is evidence of recovery in KZN of the most common surf-zone fishes in some previously exploited areas (Mann et al., 2016).

There are currently 41 such launch sites which participate in the Boat Launch Site Monitoring System (BLSMS) (Figure 8), 23 of which are licenced by the Province. In addition, 17 other public launch sites that fall within Durban and Richards Bay harbours as well as iSimangaliso Wetland Park also participate in the BLSMS, albeit voluntarily, thus providing comprehensive coverage of all small vessel launching activities in the Province. In 2015, a total of 56 323 individual marine launches was recorded (Mann et. al., 2016).



A formal coastal access point (Marinel Willemse)

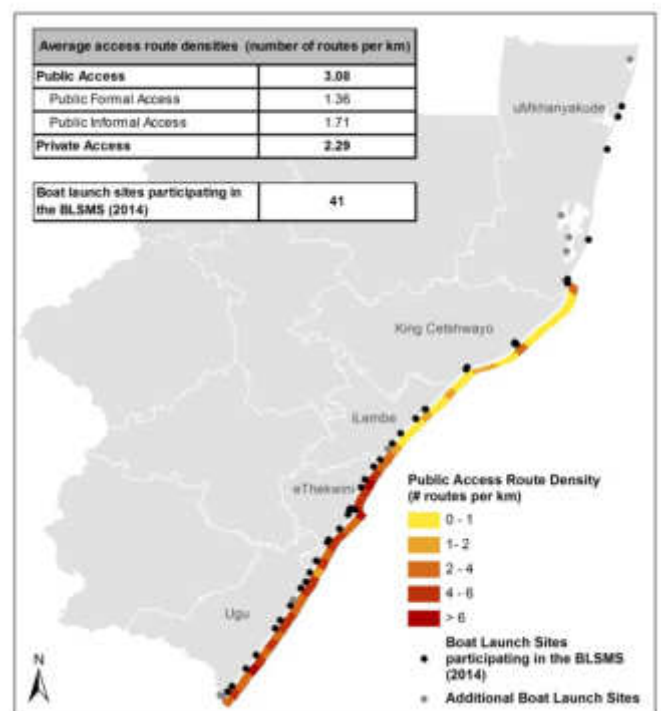


Figure 8: Coastal access density and boat launch sites along the KZN coast

2.7.4 Climate change

There are a number of natural drivers of climate change, including events such as solar radiation and volcanic activities. However, human influence on the climate system is clear and there is now a much better understanding of the likely impacts of climate change, many of which relate to coastal environments with implications for human activities and resource use. One central feature of climate change is that much of the Earth's increased climatic heat is stored in the oceans, some 90% of the accumulated energy, causing oceans to warm, especially near the surface (60%) where the upper 75 m has warmed by 0.11°C (0.09 to 0.13°C) per decade over the past 40 years. Ocean warming is projected to continue with heat increasingly penetrating from the surface to the deep ocean and thus affecting ocean density, circulation and currents.

Sea-level rise

Although sea-level records in South Africa only date back to the 1950s with intermittent readings, recent and more comprehensive data reveal that sea levels are rising around the southern African coastline, in line with current global trends. However, there are distinct regional differences in the estimated rate of sea-level rise; with sea-level rise in the region highest in KZN, rising by +2.74 mm per year (Mather et al., 2009). Clearly, this is a major cause for concern, as much of the coast comprises sandy shores, which are the most vulnerable to change. Rising sea levels have the ability to cause a progressive retreat in the shoreline, as is evident from historical shoreline records for KZN (Cooper, 1991). The impact of sea-level rise is exacerbated by interference with natural coastal functioning, presenting a serious challenge for coastal management programmes to deal with this looming threat, both in terms of mitigation and adaptation.

2.7.5 Coastal erosion

Erosion is an intrinsic part of the natural coastal system, whereby a coast adjusts to the availability of sediment and the ambient wave and tide conditions, within the framework of the surrounding solid geology (Smith et al., 2014). Coastal erosion events are driven by sea-level rise and an apparent increase in wave and swell height with time. The effects are exacerbated by a regional sand deficit, due to extensive droughts, sand mining, dam construction and unwise coastal development (Smith et al., 2014).

The KZN coastline is generally eroding at rates of between 20 cm to 2 m per year, as part of the natural cyclical state of the coast. However, evidence suggests that this is being exacerbated by anthropogenic impacts. A sand supply study for eThekweni rivers revealed that of "natural" sand supply to the coast (based on 15% yield), approximately one-third was trapped in dams and one-third was lost through sand mining activities meaning that only one-third of sand makes it to the coast, resulting in a sand deficiency which has long-term impacts (Theron et al., 2008).

The extreme weather KZN experienced in March 2007 created a single coastal erosion event which illustrates the impact, with losses to municipal infrastructure alone exceeding R 240 million. The areas most affected included Margate, Scottburgh, Isipingo Beach, eThekweni Golden Mile, Umhloti and KwaDukuza's Dolphin Coast (Ballito and Salt Rock).

2.7.6 Land and marine-based sources of pollution

Marine and coastal pollution is a worldwide problem, affecting ecosystems and habitats as well as the social and economic health of coastal communities. The sources of pollutants can be land-based or sea-derived and includes litter and marine debris, sewage, oil, chemical waste, fertilisers, animal waste and pesticides.

Litter

Coastal and marine litter occur as a result of inappropriate disposal of rubbish on land, which impacts beachgoers and coastal residents. Poorly managed weirs and stormwater outlets, informal settlements, road verges and parking lots result in litter being washed or blown into waterways, which ultimately end up in the marine and coastal environment. This litter can kill marine animals through ingestion, suffocation, starvation, drowning and increased vulnerability to predators.

In order to address coastal litter an international coastal clean-up is undertaken annually. In 2015, a total of 22 871 kg of litter was collected along 389 km of the KZN coast (PlasticsSA, 2015). This litter consists mainly of cigarette butts, food wrappers, beverage bottles, bottle caps, straws, grocery bags, glass bottles, paper bags and cans (Ezemvelo, 2014). Increasing amounts of polystyrene are also being collected during clean-ups, which poses a threat to the coastal and marine environments.

Marine Debris

Marine debris can be defined as persistent man-made solid materials directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment, including harbours. Such debris can originate from numerous activities at sea ranging from small vessels, yachts, fishing craft and tourist operations to large commercial ships and cruise liners. It follows that levels of marine debris are highest in proximity to shipping lanes, major fishing grounds and ports. However, strict international MARPOL (International Convention for the Prevention of Pollution from Ships) rules exist to regulate the disposal of waste at sea, which has ameliorated the problem somewhat. Most ports have similar rules and should provide refuse collecting services. The items that make up marine debris are enormously varied but include a high proportion of non-degradable and harmful plastics. In many cases debris sinks to the bottom where it can cover and kill fragile reefs. Invariably, floating marine debris washes out in the coastal zone, evident from the annual coastal clean-up results.



Aerial view of Kongweni Estuary and Margate Main Beach (Bronwyn Goble)

Marine Outfalls

A marine outfall is a pipe or a tunnel that transports industrial and household effluents to sea (Tomalin and Goble, 2014). Most deep sea outfalls or marine discharges in South Africa are controlled in terms of the ICM Act. In KZN there are seven such deep water outfalls, five located between Umkomaas and Durban, and two in the Richards Bay area. They are well-designed offshore pipelines with hydraulically efficient diffusers operating in water depths of more than 20 m (Tomalin and Goble, 2014). The coastal waters of KZN receive an estimated 555 000 m³ of domestic and industrial effluent every day. Despite being monitored, their cumulative impact on the surrounding marine and coastal environment remains uncertain.

Sewage

The treatment of sewage, as reflected in the 2014 Green Drop progress report, represents a continuous and expanding challenge that has implications for the coastal zone (Department of Water and Sanitation, 2014). Increasingly, some of KZN's rivers, estuaries and the nearshore environment have been negatively impacted by a spike in sewage spill incidents. These incidents have been triggered or exacerbated by a number of factors including a lack of maintenance of sewage infrastructure, effluent discharges which routinely exceed water quality parameters, and reduced freshwater base-flows coming down catchments. Such occurrences, in addition to their impact on aquatic life and human health, have a hidden cost in terms of the ecosystem goods and services lost. The impacts are also social and economic in nature, with the receiving environments unable to optimally provide recreational and tourism benefits.

Oil Spills

South Africa is situated on one of the world's busiest shipping routes, not to mention that KZN is home to two of the busiest ports in Africa; the Port of Durban and the Port of Richards Bay. Approximately 80% of the world's tanker traffic passes along the South African coast (Tomalin and Goble, 2014) leading to an increased potential for oil spills. Oil pollution is not solely related to shipping disasters; oil can be discharged into the sea during day-to-day operations of ships, while cleaning ship engines and accidental leakages at single buoy moorings and terminals where marine tankers load and discharge their cargo.

Metal and Organic Pollution

Heavy metals such as lead, mercury, cadmium and tin can enter the marine environment in various ways; for example: vessel anti-fouling paints, runoff from urban areas or industrial plants, contaminated ground water seepage, mining and agricultural return flows, dredging and deep-sea outfalls (Tomalin and Goble, 2014). Heavy metals can cause damage to sessile marine filter feeders; for example, mussels and oysters, because they cannot metabolise metals effectively, often resulting in bio-accumulation. Discharges from ships, e.g. through ballast water discharge can introduce a range of toxins and organisms into coastal waters, especially invasive species (Tomalin and Goble, 2014).

2.8 Towards a KZN vision and objectives for a healthy coastal environment

During the development of the White Paper for Sustainable Coastal Development in South Africa, the first shared vision for coastal management in South Africa was drafted following an extensive process of regional consultation with stakeholders (DEAT, 2000). This vision was broadly adopted by KZN in its 2004 Coastal Management Policy, but is being updated in this PCMP.

The White Paper clearly identified goals and objectives for coastal management in South Africa (DEAT, 2000). Since then there have been considerable additional issues of coastal concern, not least the growing recognition of climate change. Thus, the 2014 NCMP included further issues that should be given due consideration in determining a revised vision and objectives for coastal KZN. These include:

- Diversifying coastal economies and optimising benefits for local coastal communities;
- Promoting coastal tourism, leisure and recreational development;
- Establishing “one-stop-shops” for development approvals;
- Identifying, supplementing and managing State coastal assets;
- Identifying opportunities for improving public access to the coast and coastal resources;
- Introducing planning and development mechanisms and incentives for effective coastal management;
- Exploring opportunities for development of ports and harbours;
- Identifying opportunities for mariculture and aquaculture development;
- Developing and implementing a representative system of coastal protected areas;
- Introducing mechanisms and incentives to avoid physical development in high risk coastal areas;
- Creating incentives to promote better estuary and river mouth management practices;
- Improving co-ordination and integration of coastal and marine resource management;
- Improved co-ordination of monitoring and management of coastal pollution; and
- Rehabilitating degraded coastal areas and resources.

2.9 Status of coastal management units and boundaries

The coastal zone is a complex system incorporating a number of components and factors that give it shape and definition (Glavovic and Cullinan, 2009). In South Africa the coastal zone is defined in terms of the ICM Act as comprising coastal public property (CPP), a coastal protection zone (CPZ), coastal access land, coastal waters, coastal protected areas and the seashore, and includes any aspect of the environment on, in, under and above such area (shown schematically in Figure 11). These and other important geographic boundaries are defined under the Maritime Zones Act (15 of 1994).



Coastal vegetation at sunrise in Margate (Melissa Palmer)

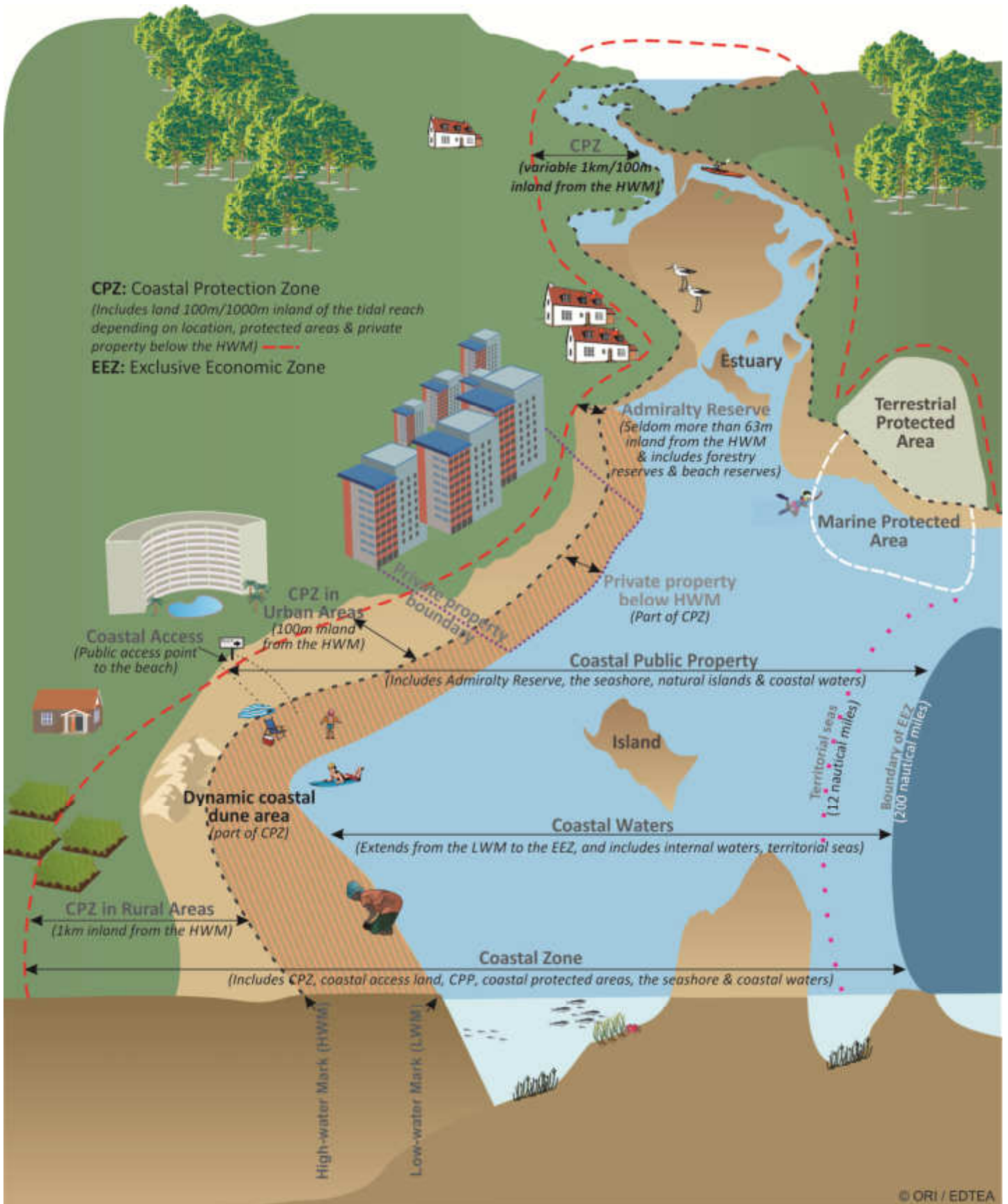


Figure 9: Schematic representation of the Coastal Zone

2.10 Coastal spatial planning and conditions of use

Legislation governing spatial planning either within the coastal zone, or overlapping with the coastal zone, is extensive. Spatial planning is already occurring in the coastal zone as a result of a range of planning processes. Those key to provincial and local government in KZN are highlighted in Table 3 (DEA, 2014).

Table 3: Planning processes and legislation governing these coastal spatial planning

PLANNING PROCESS	KEY LEGISLATION/PLAN	LEAD AUTHORITY
National Spatial Development Perspective	National Development Plan 2030	The Presidency
	National Spatial Development Perspective (NSDP) 2006	The Presidency
	Spatial Planning and Land Use Management Bill (Notice 280 of 2011)	RDLR
Biodiversity protection area as informed by biodiversity planning processes	Biodiversity Act (10 of 2004)	DEA / SANBI
	Protected Areas Act (57 of 2003)	DEA / SANBI / SANParks
	National Protected Area Strategy	DEA
Sensitive Coastal Areas	Environmental Conservation Act (73 of 1989) (areas specifically gazetted, namely areas in the Garden Route and South Coast of KZN).	DEA
Marine Protected Areas (MPAs) and Protected Areas (PAs)	Protected Areas Act (57 of 2003) [formerly under the Marine Living Resources Act (18 of 1998) (MLRA)]	DEA / SANParks / Provincial lead agency
National parks	Protected Areas Act (57 of 2003)	SANParks
Fishing zones	Marine Living Resources Act (18 of 1998)	DAFF
Mining and exploration concessions	Mineral and Petroleum Resources Development Act (28 of 2002)	DMR
Shipping and navigation routes	Marine Traffic Act (2 of 1981)	DoT
	National Ports Act (12 of 2005)	Transnet NPA
	Strategic Infrastructure Projects (SIPS) [Shipping and navigation routes Port Expansion Strategies]	Transnet NPA
National Water Resource Strategy	National Water Act (36 of 1998)	DWS
Agricultural spatial plans	Conservation of Agricultural Resources Act (43 of 1983)	DAFF
Heritage areas	National Heritage Resources Act (25 of 1999)	Heritage Resources Agency (SAHRA)
Estuary zoning plans (as part of estuary management plans)	National Estuarine Management Protocol (as required by the ICM Act)	DEA/ Provincial lead agency / Local municipalities: Responsible Authority for the Estuarine Management Plans
Coastal management lines	ICM Act	Provincial lead agency
Coastal planning schemes	ICM Act	DEA / Provincial lead agency / Local municipalities
Special management areas	ICM Act	DEA
Provincial and municipal SDFs, land use plans and zoning schemes	Municipal Systems Act (32 of 2000)	Provincial lead agency / Local municipalities
	Spatial Planning and Land Use Management Act (16 of 2013) (SPLUMA)	

DEA – Department of Environmental Affairs | DMR – Department of Mineral Resources | DoT - Department of Transport | DWS – Department of Water and Sanitation | RDLR - Rural Development and Land Reform | SANBI - Environmental Affairs / South African National Biodiversity Institute | SANParks – South African National Parks | Transnet NPA - Transnet National Ports Authority | Provincial lead agency - EDTEA

Increasing demand for ocean and coastal space makes the coordination in ocean and coastal spatial planning a priority (DEA, 2014), which is further underpinned by the new government initiative, Operation Phakisa.

In terms of the ICM Act, spatial planning is explicitly addressed in terms of special management areas, estuaries and coastal planning schemes (DEA, 2014).

2.10.1 Special management areas

The ICM Act (Section 23) makes provision for the declaration of *special management areas* by the Minister (after consultation with the MEC) if environmental, cultural or socio-economic conditions require measures to attain the objective of any CMPs; facilitate management of coastal resources for a local community; promote sustainable livelihoods for a local community; or conserve, protect or enhance coastal ecosystems and biodiversity in the area.

2.10.2 Estuaries

The National Estuarine Management Protocol governs spatial planning in estuaries as part of estuarine management plans. The responsibility for the development of estuarine management plans is set out in the National Estuarine Management Protocol. Furthermore the ICM Act provides for estuarine management plans to be prepared and adopted as part of an Integrated Development Plan (IDP) and Spatial Development Framework (SDF) (DEA, 2014).

2.10.3 Coastal planning schemes

Section 56 of the ICM Act allows for the determination of *coastal planning schemes* by the Minister, the MEC, a municipality or the management authority of a protected area for specific purposes, activities, or prohibition thereof.

2.11 Status of activity-based management programmes

The management and control of activities taking place in the coastal zone are governed under numerous Acts, with activity-based regulations, norms and standards, and guidelines having been promulgated under these Acts. A summary of this is presented in Table 4.

Table 4: Coastal zone activities and the Acts which govern these

Key Activity	Key Act/s	Lead Agency
Managing of coastal access land	ICM Act	Local government
Land reclamation	ICM Act	National government
Coastal leases and concessions	ICM Act	National government
Unlawful structures	ICM Act	National, provincial and local government
Off-road vehicles	ICM Act	National government
Boat launching sites	ICM Act	National and provincial government
Effluent discharges into coastal waters	ICM Act	National government
Dumping at sea	ICM Act	National government
Incineration at sea	Prohibited under the ICM Act (Section 70), except under specific conditions as specified.	National government
Environmental Impact Assessment	NEMA	National and provincial government
Biodiversity and protected areas management	Biodiversity Act (10 of 2004)	National, provincial and local government
	Protected Areas Act (57 of 2003)	

Key Activity	Key Act/s	Lead Agency
Dumping at sea	ICM Act	National government
Incineration at sea	Prohibited under the ICM Act (Section 70), except under specific conditions as specified.	National government
Environmental Impact Assessment	NEMA	National and provincial government
Biodiversity and protected areas management	Biodiversity Act (10 of 2004) Protected Areas Act (57 of 2003)	National, provincial and local government
Marine protected areas	Protected Areas Amendment Act (21 of 2014)	National and provincial government
Sensitive Coastal Areas	Environmental Conservation Act (73 of 1989)	National government
Heritage area management	World Heritage Convention Act (49 of 1999) National Heritage Resources Act (25 of 1999)	National government
Prevention and combating pollution from ships, including solid waste (garbage) and ballast water)	International Convention for Prevention of Pollution from Ships Act (2 of 1986) South Africa Maritime Safety Authority Act (5 of 1998) Marine Pollution (Control and Civil Liability) Act (of 1981) Merchant Shipping Act (57 of 1951)	National government
Solid waste management (land-based)	Waste Act (59 of 2008)	National, provincial and local government
Atmospheric pollution	Air Quality Act (39 of 2004)	National government
Control of scuba diving, whale watching and shark cage diving and other protected or threatened species	Marine Living Resources Act (MLRA) (18 of 1998, amended 2000) Transkei Environmental Decree and legislation controlling whales, sharks sea birds	National government
State assets in coastal zone, including 12 fishing harbours	Government Immovable Asset Management Act (19 of 2007) State Land Disposal Act (48 of 1961) MLRA	National government
Fisheries management	MLRA Sea Fishery Act (12 of 1988)	National government
Marine aquaculture or harvesting of marine living resources (sea-based)	MLRA	National government
Harvesting of coastal resources (land-based)	Conservation of Agricultural Resources Act (43 of 1983) National Forest Act (84 of 1998)	National government
Port management	National Ports Act (12 of 2005) International Health Regulations Act (28 of 1974)	National government
Shipping	Marine Traffic Act SAMSA Act	National government
Freshwater flows (quantity and water quality) into coastal zone	National Water Act (36 of 1998)	National government
Mining	Minerals and Petroleum Resource Development Act (MPRDA) (28 of 2002)	National government
Oil and gas exploration	MPRDA	National government
Coastal infrastructure (land-based)	Municipal Systems Act National Building Regulations and Building Standards Act (103 of 1977 amended 1982, 1984, 1989, 1995, 1996) Spatial planning and land use management Act (16 of 2013) Provincial Planning Acts	National, provincial and local government
Recreational Water Quality	National Health Act (61 of 2003)	National government
Renewable energy activities	National Energy Act (34 of 2008)	National government

2.12 State of the Coast reporting

The KZN provincial lead agency is responsible for promoting, coordinating and monitoring coastal management in the Province to ensure that it is undertaken in an integrated, effective and efficient manner and in accordance with the objects of the ICM Act. In terms of section 93(2) of the ICM Act, the MEC of a coastal province must report on the State of the Coast every four years, through the preparation of a report which contains information as prescribed by the Minister.

To date, State of the Coast reporting has been accommodated within State of the Environment Reports (required in terms of the NEMA), as was done for KZN in 2004. This included a chapter and specialist report on the marine and coastal environment (DAEA, 2004). However, this should in future be undertaken as a stand-alone document, under the ICM Act, with more detail than can be accommodated under the State of the Environment Reports.

2.13 Progress in cooperative governance

2.13.1 Formal institutional arrangements

There are a number of formal institutional arrangements required in order to facilitate and achieve ICM. These include ministerial political (MINMEC) and technical (MINTEC) structures under the Intergovernmental Relations Framework Act (13 of 2005), which aim to facilitate a high level of policy and strategy coherence between the three spheres of government. MINMEC: Environment is a standing intergovernmental body consisting of the Minister of Environmental Affairs, members of the provincial Executive Councils (MECs) responsible for environmental management functions and the South African Local Government Association (SALGA). MINTEC: Environment provides technical input into MINMEC. Presently, Working Group 8 (Oceans and Coasts) of MINTEC serves to fulfil the role of the National Coastal Committee as outlined in Section 35 of the ICM Act. It must promote integrated coastal management in the Republic and tangible co-operative governance by co-ordinating the effective implementation of the ICM Act and the national coastal management programme.

At a provincial level the Provincial Coastal Committee (PCC) forms the core of the institutional framework for ICM under the ICM Act (Section 39). The key function of this committee is to promote and coordinate ICM in the Province and facilitate successful implementation of the ICM Act. The KZN PCC was formally constituted under the ICM Act in August 2014, prior to which it had been operating as a voluntary co-ordinating body.

The KZN PCC holds quarterly meetings and is chaired by the Chief Director: Environmental Management (EDTEA), with secretariat support provided via the EDTEA's Coastal Management Unit. Currently there is representation from the following authorities and organisations:

- National Department of Environmental Affairs (DEA): Oceans and Coasts;
- National Department of Environmental Affairs (DEA): Environmental Protection & Infrastructure Programme - Working for the Coast;
- National Department of Water and Sanitation (DWS);
- National Department of Mineral Resources (DMR);
- National Department of Agriculture, Forestry & Fisheries (DAFF);
- KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA);
- KZN Department of Cooperative Governance and Traditional Affairs (COGTA);
- Ezemvelo KZN Wildlife (Ezemvelo);
- iSimangaliso Wetland Park Authority;
- KZN coastal metros, coastal district municipalities and local municipalities with ports;
- Transnet National Ports Authority;
- KZN Sharks Board;
- Tourism KZN;
- South African Local Government Association (SALGA);
- NGO / CBO representatives with expertise in coastal management;
- Representatives of the academic, scientific or research community;
- Research councils with expertise in coastal management;
- Private / Business sector; and
- Specialists

The KZN PCC will establish sub-committees as the need arises on either a permanent or temporary basis to deal with issues or spatial areas which require more detailed coastal management attention.

2.13.2 Informal support elements

In addition to the formal structures, the framework for cooperative governance recognises the importance of governance “support elements” to achieve effective ICM. These include: recognition and empowerment of marginalised or previously disadvantaged communities; data and information systems; awareness, education and training; training and capacity building; scientific (research) support programmes; financial support programmes; and coordinated coastal compliance and enforcement systems. Methods to include and draw on such informal support need to be developed and accommodated in the CMP.

2.13.3 Data and information management systems

Section 93 of the ICM Act states that the Minister (Environment) and by extension the MECs of coastal provinces, must make sufficient information available and accessible to the public regarding the protection and management of the coastal environment in order to allow the public to make informed decisions as to the State’s achievements in terms of coastal management.

KZN is in the process of developing a single-portal information hub which will make relevant coastal and estuarine information available to the public.

2.13.4 Awareness, education and training

A major threat to sustainable coastal management in South Africa is the insufficient capacity in government, from municipal to national level. This has a cascading impact on the effectiveness and efficiency of coastal management institutions. Training and capacity building are, therefore, a critical support element in the long-term sustainability of ICM implementation. In terms of section 38 of the ICM Act, provincial lead agencies are required to promote training, education and public awareness programmes which highlight protection, conservation and enhancement of the coastal environment, as well as sustainable use of coastal resources. This should be done in collaboration with appropriate bodies and organisations. Within KZN, Coastwatch and uShaka Sea World Education Centre are established key role players for generating awareness and education about coastal issues.

Unfortunately, a persistent lack of capacity for coastal management in many municipalities presents a significant hindrance to the effective implementation of the ICM Act (NCMP, 2015). At local government level, institutional arrangements for coastal management are still to be fully developed. There is a general lack of resources and skills dedicated to coastal management, particularly in rural areas. This means that there are needs and opportunities for intervention and proactive coastal management efforts. As a result, the mobilisation and allocation of dedicated funds by municipalities for ICM is crucial. In an attempt to boost their capacity, some local authorities co-operate with nature conservation agencies and are involved in co-management initiatives with community groups. Already, several Municipal Coastal Committees have been established in coastal districts. These promote dialogue between governmental and non-governmental stakeholders and improve co-ordination of management.

The KZN PCMP can play an important role in capacity building and transfer of information to local levels. Its mandate is an expression of KZN's responsibility to wisely manage its coastal area with its unique natural resources and complex relationship with people. Guiding behaviour and actions in the coastal zone is an important role in ensuring that the benefits of the coast can be sustainably and equitably distributed amongst all users.



MT Phoenix stranded at Sheffield Beach in 2011 (Bronwyn Goble)

2.13.5 Financing mechanisms

Roles and responsibilities are assigned to the lead agency for coastal management of each province by the ICM Act. The onus is on them to ensure sufficient budget for meeting these objectives. To date budgets or budget allowances for coastal management, particularly for new roles and responsibilities assigned to authorities under the ICM Act, have been limited.

2.13.6 Scientific research support to ICM

Sustainable coastal management has to be underpinned by sound scientific research, which aims to extend and improve the available information and knowledge base. In KZN, support is provided directly through a longstanding working agreement between EDTEA and the South African Association for Marine Biological Research (SAAMBR). Indirect support to the provincial lead agency is also provided by national institutions, such as the South African Network for Coastal and Oceanic Research (SANCOR), the National Research Foundation (NRF) and the Council for Scientific and Industrial Research (CSIR). Locally, the Province draws considerable support from Ezemvelo KZN Wildlife. In addition, research focused on the KZN coast is undertaken by local research agencies, universities and consultancies. In many cases large international programmes generate important scientific information relating to the KZN coast, and these should be fostered.

2.13.7 Coordinated compliance and enforcement systems

Section 32 of the ICM Act tasks provincial lead agencies to take all reasonably practical measures to monitor compliance with, and to enforce, the ICM Act. The MEC may use any powers granted under the ICM Act to implement or monitor compliance with provincial norms and standards. In addition, the Minister may specifically request provincial lead agencies to implement or monitor compliance with national norms and standards.

Our coast is a favoured residential and holiday destination, under constant pressure for development. Particularly on the KZN South Coast, there is much encroachment into coastal public property (including the Admiralty Reserve). Not only is this illegal, but this results in the loss of natural habitat and functioning, which in turn limits the coastal environment's ability to deliver the very services and resources that attracted people in the first place. Public access to the coast is also negatively affected. In dealing with such matters and to facilitate effective implementation of the ICM Act, there needs to be good compliance and proper enforcement systems in place. Of concern is that this is a shortcoming for ICM, primarily due to lack of capacity and lack of coordination between the various responsible authorities (DEA, 2014). As such, this priority area is closely linked to that of capacity building. In order to improve compliance and enforcement within the KZN coastal zone, consideration needs to be given to new and innovative ways of streamlining compliance and enforcement processes.

In improving the capacity on the ground, coastal compliance and monitoring in KZN is being supported by Ezemvelo KZN Wildlife who perform the following coastal management functions on behalf of DEA and EDTEA:

- Enforcement of the beach driving ban;
- Monitoring of boat launch sites;
- Monitoring of coastal zone developments and reporting of illegally commenced activities;
- Reporting of Admiralty Reserve encroachments;
- Monitoring the status of estuaries, especially visual monitoring and reporting of outfalls and discharges into estuaries;
- Monitoring of and support to coastal emergencies, disasters and pollution incidents;
- Coastal education and awareness, in particular liaison with stakeholders and implementing community outreach projects such as the International Coastal Cleanup;
- Marine protected area (MPA) management, including compliance of dive permits/operators for shark cage diving and compliance of boat-based whale watching (BBWW);
- Monitoring of coastal habitats and conducting related research along the coast; and
- Response to strandings of marine mammals and seabirds, and transport to rehabilitation centres where applicable.



3.1 Mandatory roles and responsibilities

The ICM Act outlines the roles of national, provincial and local government, a number of which are mandatory as detailed in Tables 5 to 7.

Table 5: Roles and Responsibilities of National Government

	ASPECT	ICM ACT SECTION/S	BRIEF DESCRIPTION OF ROLES AND RESPONSIBILITIES
1	The management of coastal public property	7,8,9,10,11,12,13,14,15,21,26,27,32	Ensure the State as a public trustee; and provide for the protection, management and enhancement of coastal public property as an inalienable area within the coastal zone that belongs to the citizens of South Africa.
2	The National Estuarine Management Protocol	33,34	Ensure that the National Estuarine Management Protocol is developed and that estuarine management plans for each estuary along the South African coastline are in place.
3	The National Coastal Committee	35,36,37	Establishment of the National Coastal Committee, determination of its powers and appointing representatives for the Committee.
4	Monitor the appointment of provincial lead agencies	38	Ensure that provincial lead agencies for ICM are appointed, established and functioning on a continual basis.
5	Development and Implementation of the National Coastal Management Programme	44,45	Develop a National Coastal Management Programme aligned with the vision and objectives of the ICM Act.
6	Consistency and alignment between the National Coastal Management Programme and other statutory plans	51,52	Ensure that any plan, policy or programme adopted by an organ of state that may affect coastal management is consistent and aligned with the NCMP.
7	Consultation and public participation	53	Ensure meaningful consultation with government and other coastal stakeholders.
8	Environmental authorisations for coastal activities	63,64	Ensure that the competent authority refers, in terms of S63(4), applications that are inconsistent with S63(2), but are in the public interest, to the Minister for consideration. Ensure that where an environmental authorization is not required for coastal activities, the Minister considers listing activities that will be requiring a permit or license in terms of S63(6).
9	Discharge of effluent into coastal waters	69	Ensure that point source discharges of effluent are effectively assessed, controlled and monitored.
10	Dumping of waste into coastal waters	70,71	Prohibit incineration at sea and ensure that the overall intent of S70 and S71 is understood by stakeholders.
11	Emergency dumping at sea	72	Ensure that consideration is given to emergency situations relating to the dumping of waste at sea.
12	The National Action List	73	Ensure that an effective screening mechanism is available to support assessment of dumping applications.
13	Determination of national appeals powers	78	Establish powers of Minister and MEC's and procedures to be followed in determining appeals.
14	Prescribing regulations and fees	83	Develop regulations for the management of activities within coastal public property and consult the Minister of Finance before making any regulations which will entail expenditure of funds in future years, application fees, or regulations imposing fees, costs or any other charges.
15	General provisions applicable to regulations	85	Specify general procedures relating to regulations, including penalties for contraventions.

(Source: DEA, 2014)

Table 6: Roles and Responsibilities of Provincial Government

	ASPECT	ICM ACT SECTION/S	BRIEF DESCRIPTION OF ROLES AND RESPONSIBILITIES
1	Management of the coastal protection zone	16, 17	The provincial lead agency must ensure the designation of the coastal protection zone in order to ensure the protection, management and enhancement of the coastal protection zone.
		26(1(b)); 28(1)	The MEC may determine and adjust the boundaries of the coastal protection zone, but cannot do this in a manner that changes the boundaries of coastal public property.
2	Access to coastal public property	13(1)	The provincial lead agency has oversight in ensuring people's right to reasonable access, use and enjoyment of coastal public property.
3	Establishment of coastal management lines	25	The provincial lead agency must establish coastal management lines in order to protect coastal public property, private property and public safety; to protect the coastal protection zone; and preserve the aesthetic values of the coastal zone.
4	Marking coastal boundaries on zoning maps	31	Inform municipalities of any coastal boundaries determined or adjusted in terms of S26.
5	Estuarine management plans	34	If identified in terms of S33 (3)(e) as the responsible party for the development of estuarine management plans - to undertake these in accordance with the National Estuarine Management Protocol.
6	Designation of provincial lead agency	38	Designation of the provincial lead agency must be done by the Premier and must ensure that there is at all times a lead agency for coastal management in the Province which is responsible to the MEC.
7	Monitoring coastal management	38(2)(b)	The provincial lead agency is responsible for monitoring coastal management in the Province to ensure that it is undertaken in an integrated, effective and efficient manner and in accordance with the objects of the ICM Act.
8	Support PCC	38(2)(e)	The provincial lead agency must provide logistical and administrative support to the PCC.
9	Establishment of a PCC	39, 40 & 41	The establishment and functioning of a Provincial Coastal Committee needs to be undertaken and representatives appointed.
10	Development and implementation of a PCMP	46 & 47	The provincial lead agency is required to develop a Provincial Coastal Management Programme.
11	Consistency and alignment between PCMP and other statutory plans	51 & 52	The provincial lead agency must ensure consistency and alignment of statutory plans with the PCMP and that the PCMP is aligned with the NCMP.
12	Consultation and public participation	53	Consultation and public participation are required by the MEC, Minister or other persons exercising powers in terms of the ICM Act.
13	Environmental authorisation for coastal activities	63(1)(c)	Environmental authorisations for coastal activities must take into account whether coastal public property, the coastal protection zone or coastal access land will be affected, and if so, the extent to which the proposed development or activity is consistent with the purpose for establishing and protecting those areas.
		63(1)(d)	Environmental authorisations for coastal activities must consider estuarine management plans, coastal management programmes and coastal management objectives.
		63(1)(f)	Environmental authorisations for coastal activities must consider the likely impact of the proposed activity on the coastal environment, including the cumulative effect of its impact together with those of existing activities.
		63(1)(g)	Environmental authorisations for coastal activities must consider the likely impact of coastal environmental processes on the proposed activity.
14	Regulations by the MEC	84, 85	The MEC of a Province may, after consultation with the Minister, make regulations that are consistent with any national norms or standards and may develop regulations for the management of activities within the coastal zone and specify general procedures relating to regulations, including penalties for contraventions.
15	Information and reporting on coastal matters	93	Prepare a report on the state of the coastal environment for the Province which must contain any information prescribed by the Minister.
16	Coordination of actions between Province and municipalities	94	Liaise with coastal municipalities to coordinate actions taken in terms of the ICM Act by Province with actions taken by municipalities.

(Source: DEA, 2014; ICM Act)

Table 7: Roles and Responsibilities of Local Government

	ASPECT	ICM ACT SECTION/S	BRIEF DESCRIPTION OF ROLES AND RESPONSIBILITIES	PROVINCIAL GOVERNMENT'S ROLE
1	Designation of coastal access land	18, 19, 20	<ul style="list-style-type: none"> Ensuring that the public has equitable access to coastal public property by designating coastal access land; Make a by-law that designates strips of land to provide access to CPP along the coast; and Withdraw inappropriate coastal access land and follow an environmentally sensitive and socially responsible process in designating coastal access land. 	Advisory – assisting LMs with determination as to inappropriate/appropriate coastal access.
2	Coastal management line demarcation on zoning maps	25	<ul style="list-style-type: none"> Participation in coastal management lines determination; and Delineating coastal management lines on municipal zoning scheme maps. 	Provincial government is the lead agency for the establishment of coastal management lines
3	Impose fees within coastal public property	13(3)	Obtain the approval of the Minister before charging any fee for access to coastal public property.	Advisory
4	Determining and adjusting coastal boundaries of coastal access land	29	Ensure specified considerations are taken into account when determining or adjusting a coastal boundary of coastal access land.	Advisory – assist with appropriate considerations for adjusting boundaries.
5	Marking coastal boundaries on zoning maps	31	Delineate coastal boundaries determined or adjusted in terms of S26 on zoning scheme maps.	N/A
6	Estuarine management plans	34	If identified in terms of S33(3)(e) as the responsible party for the development of estuarine management plans - to undertake these in accordance with the National Estuarine Management Protocol.	Advisory – assist municipalities with estuarine management plans.
7	Municipal Coastal Management Programmes	48,49,55	Prepare and adopt a municipal coastal management programme for managing the coastal zone or specific parts of the coastal zone in the municipality.	Guidance on the requirements of MCMP's and ensuring alignment with the PCMP.
8	Consistency and alignment between Municipal Coastal Management Programmes and other statutory plans	51,52	<ul style="list-style-type: none"> Ensure that any plan, policy or programme adopted by an organ of state that may affect coastal management is consistent and aligned with municipal coastal management programmes which in turn is aligned with provincial coastal management programmes and the national coastal management programme; and Ensure that IDPs (including its spatial development framework) are consistent with other statutory plans [See S52(1) (a-f)] adopted by either a national or a provincial organ of state. 	Advisory – Ensure that MCMP's align with the PCMP and other related documents.
9	Consultation and public participation	53	Adequate consultation and public participation should precede the exercising of a power by a municipality.	N/A
10	Implementation of land use legislation in coastal protection zone	62	In implementing any legislation that regulates the planning or development of land, in a manner that conforms to the principles of co-operative governance contained in Chapter 3 of the Constitution, apply that legislation in relation to land in the coastal protection zone in a way that gives effect to the purposes for which the protection zone is established as set out in S 17.	Advisory.

(Source: DEA, 2014 - Adapted)



4.1 Vision for the KZN coast

The vision for the KZN coast is based on the NCMP, the Coastal Policy for KZN (2004) and the expertise of the Provincial Coastal Committee (PCC). The vision highlights the coastal management objectives for the coastal zone in the Province and the need for sustainable use of coastal resources.

VISION FOR THE KZN COAST

A vibrant, healthy and safe coast with sustainable access to resources for all.

MISSION

Through co-operative governance and best practice the intrinsic value of the coast is protected, restored and enhanced for future generations, while promoting equitable access and sustainable use of coastal resources for all stakeholders and user groups.

4.1.1 Principles underpinning the vision for KZN

The ICM Act and coastal management in general are underpinned by a number of core principles as outlined by the NCMP (DEA, 2014). The following are applicable to coastal management, in addition to those highlighted by NEMA, as they provide a departure point for translating the vision into practice:

NATIONAL AND PROVINCIAL ASSET	The coast must be retained as a national and provincial asset, with public rights to access and benefit from the many opportunities provided by the coast.
ECONOMIC DEVELOPMENT	Economic development opportunities must be optimised to meet society's needs and to promote the well-being of coastal communities.
SOCIAL EQUITY	Coastal management efforts must be optimised to meet societies' needs and to promote the wellbeing of coastal communities.
ECOLOGICAL INTEGRITY	The diversity, health and productivity of coastal ecosystems must be maintained and where appropriate rehabilitated.
HOLISM	The coast must be treated as a distinctive and indivisible system, recognising the interrelationships between coastal users and ecosystems and between the land, sea and air.
ASSIMILATIVE CAPACITY LIMITATIONS	Coastal ecosystems have finite assimilative capacity to accommodate development and exploitation in a sustainable manner, both living and non-living resources.
VULNERABILITY	The coast is an ecosystem of great value but inherently vulnerable to development and the impacts of climate change.
RISK AVERSION AND PRECAUTION	Coastal management efforts must adopt a risk-averse and precautionary approach under conditions of uncertainty.
ACCOUNTABILITY AND RESPONSIBILITY	Coastal management is a shared responsibility and all people must be accountable for their actions, including financial liability for negative impacts.
DUTY OF CARE	All people and organisations must act with due care to avoid negative impacts on the coastal environment and coastal resources.
INTEGRATION AND PARTICIPATION	A dedicated, co-ordinated and integrated approach must be developed and conducted in a participatory, inclusive and transparent way.
DIFFERENTIATED APPROACH	While a generic management framework is important, mechanisms of implementation cannot be rigid as ICM is contextual.
ADAPTIVE MANAGEMENT	Incrementally adjusting practices based on learning through common sense, experience, experimenting and monitoring "learning-by-doing".
COOPERATIVE GOVERNANCE	Working together to ensure consistency in approach among all spheres of government and stakeholders.

4.2 KZN priorities for ICM

The situation assessment outlined in Chapter 2 reflects the current state of KZN's coastal zone. This information and the identified national priorities in the NCMP have been used to distil key priorities for ICM in KZN towards achieving the vision. The priorities considered for KZN underwent a consultative process with the PCC steering committee, whereby issues were identified and workshopped to determine nine key priority areas for KZN coastal management. These are shown in Figure 10. It was difficult to rank any of these areas as 'more or less' important (Goal, Objectives and Key Actions for each priority area are detailed in the Section 5). The priority areas identified for KZN are closely aligned with the NCMP, with all nine of the NCMP priority areas being addressed within the KZN priority areas.



Figure 10: ICM priority areas



Seine-netters hard at work (Sean Fennessy)



The vision, together with the nine priorities, provides the primary policy directive for coastal management in KZN. Specific management objectives and actions are required in order to address these priorities over the short- and long-term.

This section addresses the KZN coastal management objectives and actions for coastal management and highlights specific actions that will be undertaken by EDTEA as part of its commitments under this PCMP.

5.1 Priority Area: Coastal access

GOAL: Promote safe and equitable access to the coast			
Management Objectives	Action	Targets	
		Completion Date	Performance indicator
Enable physical public access to the sea, and along the seashore, on a managed basis	Continue the management of public launch sites in KZN	2017/2018	Listing (gazetting) of public launch sites in KZN
		Ongoing	Annual boat launch sites report
	Support to municipalities for the designation of coastal access land through undertaking a baseline coastal access assessment	2017/2018	Baseline mapping of KZN coastal access Verification of coastal access in KZN

5.2 Priority Area: Coastal and marine planning

GOAL: Promote balance between economic development and conservation of natural resources			
Management Objectives	Action	Targets	
		Completion Date	Performance indicator
Ensure coastal development is appropriate	Management measures and tools for development in the coastal zone	2017/2018	Best practice guideline for developing in the coastal zone
Protect the existing natural coastal environment	Identification of areas/zones (special management areas) for protection	2018/2019	List of priority areas/zones (special management areas) for protection provided to DEA

5.3 Priority Area: Coastal information and research

GOAL: Promote relevant research and access to information			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Develop an appropriate information management and sharing system	Develop a public coastal information sharing portal	2017/2018	Live, interactive Information-sharing portal
Identify research priorities and opportunities in support of ICM	Develop a KZN coastal management research strategy	2019/2020	KZN coastal management research strategy

5.4 Priority Area: Coastal vulnerability: adaptation and building resilient communities

GOAL: Promote resilience to the effects of climate change, dynamic coastal processes and natural hazards			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Ensure that coastal planning and development minimises the exposure of people, infrastructure and economic activities to significant risk from dynamic coastal processes	Develop coastal management lines (CML's) for KZN	2018/2019	Gazetted coastal management lines for KZN
	Identify appropriate avenues to implement CML's	2017/2018	Framework for implementation of CML's
	Develop CML's for estuaries	2019/2020	Gazetted coastal management lines for KZN estuaries
Facilitate rehabilitation of degraded natural coastal infrastructure, coastal ecosystems and habitats	Identify and prioritise hot spots for coastal rehabilitation in KZN	Ongoing	Identified hot spots for coastal rehabilitation

5.5 Priority Area: Cooperative governance

GOAL: Establish and strengthen institutional partnerships and mechanisms for ICM to facilitate better management			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Promote provincial as well as local government objectives through participation in the National Coastal Committee (MINTEC Working Group 8)	Ensure formal nomination and representation at the NCC (MINTEC Working Group 8)	Completed	Official letter of nomination issued by Head of Department
	Evaluation of relevant issues from Municipal Coastal Committees (MCC's) and the KZN PCC to NCC	Ongoing	List of evaluated issues elevated to Working Group 8
Strengthen and support Provincial and Municipal Coastal Committees	Formally appoint KZN PCC members	2017/2018 and every 3 years thereafter	Official letters of appointment issued by MEC
	Convene and record quarterly KZN PCC meetings	Ongoing	Records of quarterly KZN PCC meetings
	Provincial representation and support to MCC's	Ongoing	EDTEA representative nominated for each MCC
Establish strategic PCC sub-committees with Terms of Reference specific to improve governance and ICM implementation.	Identify key focus areas in need of sub-committee support	On a needs basis	Terms of reference for at least two sub-committees finalised and first meetings held
	Develop TOR for (1) MPA liaison and (2) Estuarine sub-committees		

5.6 Priority Area: Education, awareness and training

GOAL: Develop capacity and promote public awareness and education for integrated coastal management			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Build political and stakeholder support for effective coastal management in KZN	Develop and disseminate popular materials to support the implementation of the KZN PCMP	2017/2018	KZN PCMP summary distributed to stakeholders and politicians
Create general awareness about the coast and coastal issues in KZN, in order to change behaviour (linked to understanding & appreciating the value of the coast)	Continue to produce an annual coastal newsletter for KZN (Ulwandle)	Annually	Annual coastal newsletter
	Roll-out interpretive and informative signage along the KZN coast	2018/2019	Number of interpretive and informative signage boards along the KZN coast
Undertake a prioritised ICM training and capacity development programme	Needs analysis for ICM training in KZN	Ongoing	Annual needs analysis report developed
	ICM training workshops and appropriate short courses convened	Annually	1 dedicated ICM training course per year

5.7 Priority Area: Estuarine management

GOAL: Undertake estuarine management which optimises the value of these systems on a sustainable basis			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Ensure management of estuaries in accordance with the National Estuarine Management Protocol	Identification of KZN priority estuaries for the development of estuarine management plans	2017/2018	List of priority estuaries for the development of estuarine management plans
	Develop KZN estuary breaching policy	2017/2018	KZN estuary breaching policy
	Develop estuarine management plan for the Kongweni Estuary	2017/2018	Estuarine management plan for the Kongweni Estuary
	Develop estuarine management plans for the Tongati and Mahlongwa estuaries	2018/2019	Estuarine management plans for the Tongati and Mahlongwa estuaries
Long-term monitoring of estuaries	Visual assessment of estuarine status	Ongoing	A three-yearly report with annual updates
	Physical monitoring of priority estuaries		

5.8 Priority Area: Land and marine-based sources of pollution

GOAL: Minimise the impacts of pollution and waste on the health of coastal communities and coastal ecosystems			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Develop and implement water quality improvement programmes for prioritised coastal areas	Assessment of coastal water quality in KZN	Annually	Annual report of coastal water quality in KZN
Develop and implement pollution control measures using best practice	Support to the development of oil and hazard spill contingency plans for sections of the KZN coast not covered by existing plans	Ongoing	Oil and hazard spill contingency plans

5.9 Priority Area: Monitoring, compliance and enforcement

GOAL: Monitor the State of the Coast (SoC) and promote compliance with coastal and other regulations			
Objectives	Action	Targets	
		Completion Date	Performance indicator
Reporting on the state of the KZN coastal environment	Identification of indicators for State of the Coast reporting	2017/2018	List of indicators for State of the Coast reporting
	Develop State of the Coast (SoC) Report for KZN	2018/2019	SoC Report completed
	Develop a strategy for coastal monitoring and reporting	2018/2019	Provincial SoC monitoring and reporting implementation plan developed
Long-term coastal monitoring	Undertake aerial inspection surveys of the coastline	Bi-annually	Reports on inspection surveys to inform compliance and enforcement
	Shoreline change monitoring	Ongoing	Annual data update report



Implementation of this PCMP is driven by the KZN Department of Economic Development, Tourism and Environmental Affairs. This includes commitment to meeting the priorities, objectives and actions outlined by the PCMP as well as various relevant national drivers such as the National Development Plan, NCMP and Operation Phakisa.

Implementation of the programme is pivotal to success of the PCMP and achievement of its objectives through the actions detailed. Each action should outline key targets and resource requirements to assist with implementation. The PCMP requires monitoring and reporting procedures as well as indicators and interim indicators (adapted from DEA, 2014 after IUCN, 2003). A summary of the proposed timing for implementation is shown in Table 8, from which it is evident that there is much to do over the next five years.

While the PCMP provides the policy directive for the management of the KZN coastal zone, it duly recognises the importance that MCMP's and the iSimangaliso Integrated Management Plan play in the management of the coast at the local level. Future revisions of the MCMP's and the iSimangaliso Integrated Management Plan should therefore take guidance from the PCMP.

The next substantive review and amendment of the PCMP will occur five years after publication of this PCMP, in compliance with the requirements of the ICM Act.

Table 8: Summary of proposed implementation timing for identified actions

Priority Area	Goal	Management Objectives	Action	Performance indicator	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022	
Coastal access	Promote safe and equitable access to the coast	Enable physical public access to the sea, and along the seashore, on a managed basis	Continue the management of public launch sites in KZN	Listing (gazetting) of public launch sites in KZN						
			Support to municipalities for the designation of coastal access land through undertaking a baseline coastal access assessment	Annual boat launch sites report						
				Baseline mapping of KZN coastal access						
Coastal and marine planning	Promote balance between economic development and conservation of natural resources	Ensure coastal development is appropriate	Management measures and tools for development in the coastal zone	Best practice guideline for developing in the coastal zone						
		Protect the existing natural coastal environment	Identification of areas/zones (special management areas) for protection	List of priority areas/zones (special management areas) for protection provided to DEA						
Coastal information and research	Promote relevant research and access to information	Develop an appropriate information management and sharing system	Develop a public coastal information sharing portal	Live, interactive Information-sharing portal						
		Identify research priorities and opportunities in support of ICM	Develop a KZN coastal management research strategy	KZN coastal management research strategy						
Coastal vulnerability: adaptation and building resilient communities	Promote resilience to the effects of climate change, dynamic coastal processes and natural hazards	Ensure that coastal planning and development minimises the exposure of people, infrastructure and economic activities to significant risk from dynamic coastal processes	Develop coastal management lines (CML's) for KZN	Gazetted coastal management lines for KZN						
			Identify appropriate avenues to implement CML's	Framework for implementation of CML's						
			Develop CML's for estuaries	Gazetted coastal management lines for KZN estuaries						
			Facilitate rehabilitation of degraded natural coastal infrastructure, coastal ecosystems and habitats	Identify and prioritise hot spots for coastal rehabilitation in KZN	Identified hot spots for coastal rehabilitation					
Cooperative governance	Establish and strengthen institutional partnerships and mechanisms for ICM to facilitate better management	Promote provincial as well as local government objectives through participation in the National Coastal Committee (MINTEC Working Group 8)	Ensure formal nomination and representation at the NCC (MINTEC Working Group 8)	Official letter of nomination issued by Head of Department						
			Evaluation of relevant issues from Municipal Coastal Committees (MCC's) and the KZN PCC to NCC	List of evaluated issues elevated to Working Group 8						
			Formally appoint KZN PCC members	Official letters of appointment issued by MEC						
			Strengthen and support Provincial and Municipal Coastal Committees	Convene and record quarterly KZN PCC meetings	Records of quarterly KZN PCC meetings					
				Provincial representation and support to MCC's	EDTEA representative nominated for each MCC					
			Establish strategic PCC sub-committees with Terms of Reference specific to improve governance and ICM implementation.	Identify key focus areas in need of sub-committee support	Terms of reference for at least two sub-committees finalised and first meetings held					
				Develop TOR for (1) MPA liaison and (2) Estuarine sub-committees						

Priority Area	Goal	Management Objectives	Action	Performance indicator	2017 / 2018	2018 / 2019	2019 / 2020	2020 / 2021	2021 / 2022
Education, awareness and training	Develop capacity and promote public awareness and education for integrated coastal management	Build political and stakeholder support for effective coastal management in KZN	Develop and disseminate popular materials to support the implementation of the KZN PCMP	KZN PCMP summary distributed to stakeholders and politicians					
		Create general awareness about the coast and coastal issues in KZN, in order to change behaviour (linked to understanding & appreciating the value of the coast)	Continue to produce an annual coastal newsletter for KZN (Ulwandle)	Annual coastal newsletter					
		Undertake a prioritised ICM training and capacity development programme	Roll-out interpretive and informative signage along the KZN coast	Number of interpretive and informative signage boards along the KZN coast					
			Needs analysis for ICM training in KZN	Annual needs analysis report developed					
			ICM training workshops and appropriate short courses convened	1 dedicated ICM training course per year					
Estuarine management	Undertake estuarine management which optimises the value of these systems on a sustainable basis	Ensure management of estuaries in accordance with the National Estuarine Management Protocol	Identification of KZN priority estuaries for the development of estuarine management plans	List of priority estuaries for the development of estuarine management plans					
			Develop KZN estuary breaching policy	KZN estuary breaching policy					
			Develop estuarine management plan for the Kongweni Estuary	Estuarine management plan for the Kongweni Estuary					
			Develop estuarine management plans for the Tongati and Mahlongwa estuaries	Estuarine management plans for the Tongati and Mahlongwa estuaries					
		Long-term monitoring of estuaries	Visual assessment of estuarine status	A three-yearly report with annual updates					
			Physical monitoring of priority estuaries						
Land and marine-based sources of pollution	Minimise the impacts of pollution and waste on the health of coastal communities and coastal ecosystems	Develop and implement water quality improvement programmes for prioritised coastal areas	Assessment of coastal water quality in KZN	Annual report of coastal water quality in KZN					
		Develop and implement pollution control measures using best practice	Support to the development of oil and hazard spill contingency plans for sections of the KZN coast not covered by existing plans	Oil and hazard spill contingency plans					
Monitoring, compliance and enforcement	Monitor the State of the Coast (SoC) and promote compliance with coastal and other regulations	Reporting on the state of the KZN coastal environment	Identification of indicators for State of the Coast reporting	List of indicators for State of the Coast reporting					
			Develop State of the Coast (SoC) Report for KZN	SoC Report completed					
			Develop a strategy for coastal monitoring and reporting	Provincial SoC monitoring and reporting implementation plan developed					
		Long-term coastal monitoring	Undertake aerial inspection surveys of the coastline	Reports on inspection surveys to inform compliance and enforcement					
			Shoreline change monitoring	Annual data update report					



The KZN coastal environment is unique and complex to manage, and coastal management authorities are faced with a diverse range of challenges. Strategic coastal management objectives are required to set definitive and implementable goals in order to improve coastal management within KZN.

The PCMP is intended to function as an integrative planning and policy instrument, guiding the management of a diverse array of activities within the KZN coastal zone, without compromising environmental integrity or economic development. The PCMP recognises the paradox of the high levels of poverty and unemployment in an otherwise rich coastal environment, and strives towards equity in access to coastal resources and opportunities.

The growing pace of climate change and its impacts on the coast, the high level of urbanisation and ribbon development along the coast, and the increasing demand for coastal land and resources all add elements of urgency and importance to this PCMP process. In this context, however, the PCMP acknowledges the important role that MCMP's and the iSimangaliso Integrated Management Plan must play in managing the coastal zone at the local level. The PCMP further recognises the respective mandates of DAFF, DEA, DMR, DPW, DWS and Ezemvelo KZN Wildlife in contributing to the overall management of the KZN coastal zone.



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- 1: Coastal erosion on Durban's beachfront (Bronwyn Goble)
- 2: A formal coastal access point (Marinel Willemse)
- 3: Enjoying the KZN coast (SAAMBR)



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