



Understanding our Coast



agriculture, environmental affairs
& rural development

Department:
Agriculture, Environmental Affairs
& Rural Development
PROVINCE OF KWAZULU-NATAL



A synopsis of KZN's coastal zone

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This document is jointly produced by the KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEA&RD) and the Oceanographic Research Institute (ORI), and is distributed at no cost.



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Introduction

What is the coast?

Your initial response might be that it is “the beach” or “the seaside”, a place where people go to relax, go fishing, go on holiday or practice rituals. In fact the coast can be described in many ways. Developing an understanding of the distinctive characteristics and qualities of the coast is essential to all “coast” users.

The coastal zone is loosely defined as the zone where land meets sea. It is an area with many unique natural attributes and development challenges, not least its popularity as a site for human settlement, development, recreation and leisure. This presents a set of complex management scenarios that calls for a truly integrated approach.

What does this guide do?

The coastal zone is a priceless treasure where a number of people live, work and spend leisure time. In response, the South African Government has developed and enacted the National Environmental Management: Integrated Coastal Management (ICM) Act (No. 24 of 2008). This is a far-reaching and innovative piece of legislation that not only provides for improved integration of management, but also contributes to a more precise system of defining the coast and its features. The new Act also promotes equitable access to, and use of, coastal resources.

It is therefore important to engage with stakeholders to heighten their awareness of the legislation and the benefits and risks of living in this unique environment, as well as the potential impacts that their activities may have on the coast. This guide is a contribution to that process and provides a brief description of the physical, biological and human components of the KwaZulu-Natal (KZN) coastal environment. It also considers some of the intrinsic assets and economic values of goods and services derived from the coastal zone. The guide also highlights challenges of living in the coastal zone and further provides an overview of the legislation that governs activities in the coastal zone.

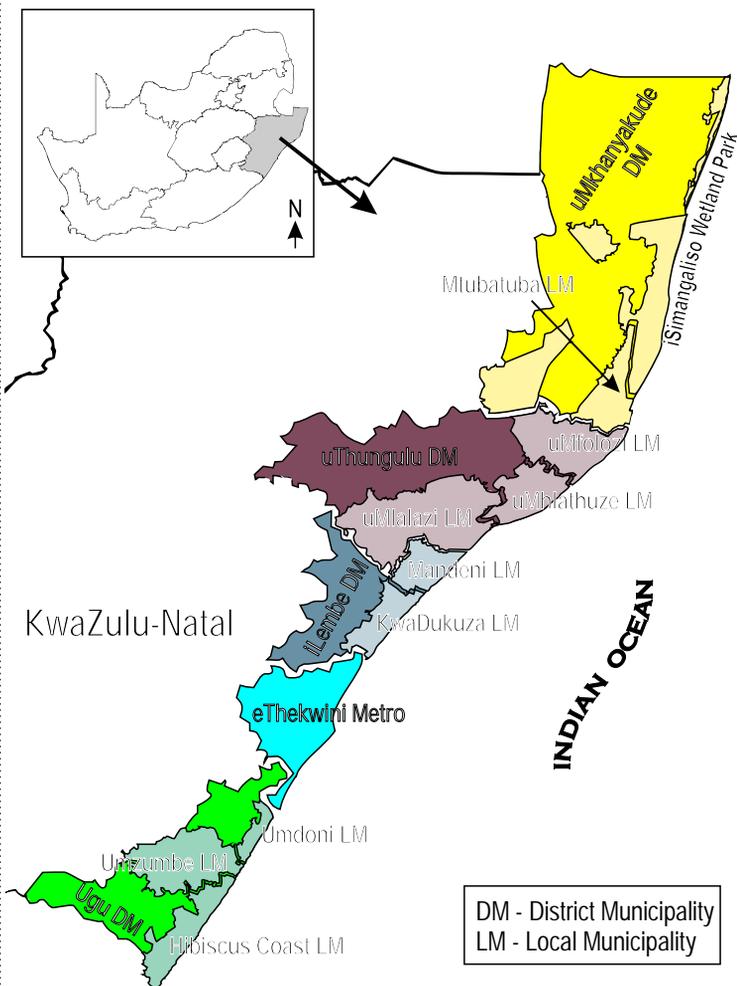
Who should read this guide?

Do you own property in the coastal zone? Do you & your family cherish using the variety of coastal services & resources? If you do, then you would want your investment & enjoyment protected through careful planning & management. This guide is primarily directed at people who live or work in the coastal zone of KZN, including those who frequent the coast, draw direct benefit from it or those whose activities impact on the coastal environment.



Map of the KZN coast

The map below shows the location of all the KZN district and local municipalities involved in coastal management. For contact details see the *Contact Details* section, pg 31.



Our KZN Coast

The KZN coast stretches some 580km in length, from the Mozambique border near Kosi Bay in the north to the Mtamvuna Estuary on the border with the Eastern Cape, and can broadly be divided into three biogeographic sections:

1. the North Coast from the Mozambique border to Richards Bay with its clear water, coral reefs and tropical environment;
2. the Central Coast from Richards Bay to Durban with its wider continental shelf, muddy bottoms and often discoloured water; and
3. the South Coast from Durban to the Mtamvuna Estuary, with its narrower continental shelf, many rivers, rocky shores and cooler environment.

The coastal climate is subtropical, often hot and humid, especially in the far north. Coastal temperatures range from the low 20°C's to high 30°C's in the summer months and from the low teens to mid 20°C's in winter, with rainfall of up to 1200mm falling mostly in summer.

All these features make the KZN coastal environment a special and very attractive place. Not surprisingly, the KZN coast has an exceptionally high population density. Coastal tourism is very popular and is one of the most important economic activities for coastal towns, offering attractive beaches, fishing and diving, affordable accommodation and accessibility from other parts of South Africa. Agriculture and, to a lesser degree, mining and timber also contribute to the coastal zone's economy: agricultural lands are generally dominated by sugar cane and subtropical fruit cultivation.

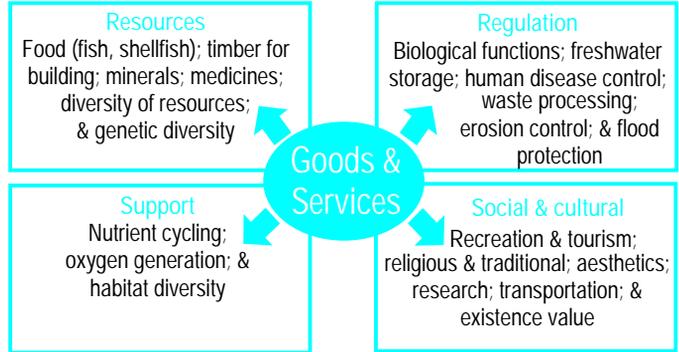
The cities of Durban and Richards Bay are the main centres of commercial and industrial activity in the province. Durban hosts the busiest port in Africa, while the Port of Richards Bay is the continent's deepest, handling a greater volume of cargo than any other port in Africa. Between them, they handle 80% of South Africa's sea-going cargo.

The coastal environment is one of the most important economic contributors for coastal towns.



GOODS & SERVICES OF OUR COAST

The coastal environment provides a wide range of benefits, also called *ecosystem goods and services*. While the more obvious benefits are fish, bathing beaches and other direct values, there are many less obvious but essential services provided by the coastal environment. These goods and services include...



Each of these goods and services has a value, often much greater than we appreciate. Based on some authors' calculations it is estimated that the direct value of goods from the KZN coast is about R17 billion annually added to the R50 billion for indirect services – totalling R67 billion each year¹.

WAVES, TIDES & CURRENTS

Waves

Waves are a primary force shaping the coastline. Their character, including height, length and frequency, determines the effect they have on the coastline. Waves are caused by the drag effects of wind on surface waters and therefore vary according to weather conditions. Hence, when storms occur at sea more forceful waves are created. There are two key wave types, constructive and destructive. Constructive "fair weather" waves are of low wave height and break gently on the shore, and these are associated with sand deposition. Destructive "storm" waves have greater wave heights and are associated with erosion. The area in which these waves break, forming the foamy, bubbly surface water, is known as the *surf zone*.



Tides

Tides are the result of gravitational forces of the moon and the sun on the world's oceans. For this reason, the tidal patterns around the world vary considerably. Along the KZN coast we have a maximal tidal range (from low to high tide) of about two metres with a periodicity of about 12½ hours, so that there are two high and two low tides per day.

¹Based on White Paper for Sustainable Coastal Development in South Africa - calculations upgraded at 6% per annum.

Our KZN Coast

As the moon has most influence on our tides, so the tidal strengths (thus heights) vary with phases of the moon. On two days each month the moon and the sun are aligned on the same side of the Earth, thus "pulling" together and creating especially high and low tides called *spring tides*, coinciding with full and new moons respectively. Twice yearly, around the end of March and September, when the lengths of day and night are equal, the centre of the sun lies in the same plane as the Earth's equator. At this time the tides may be even further increased, known as *equinox tides*.

Want to predict the next tide?

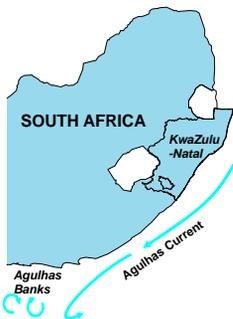
Tides are linked to phases of the moon so you can predict when they occur by simply knowing the phases of the moon. Look at the table below - it gives you approximate times of high & low tide on the KZN coast from 6am to 6pm. Add 12½ hours for the next nocturnal tide.

	Days before new or full moon							Full Moon	Days after new or full moon						
	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7
High	9.35	10.55	12.25	1.35	2.10	3.05	3.50	4.20	4.55	5.25	6.05	6.40	7.15	7.55	8.45
Low	3.10	4.30	6.00	7.10	7.45	8.40	9.25	9.55	10.30	11.00	11.40	12.15	15.50	1.30	2.20

The Agulhas Current

Water in the world's ocean basins broadly flows in a westerly direction and where this water meets land it creates so-called western boundary currents, some flowing north- and some southward. Examples are the Japan-Kuroshio Current, the USA-Gulf Stream, the Brazil Current, the Somali Current and our own Agulhas Current off KwaZulu-Natal and eastern South Africa. The Agulhas is one of the largest and swiftest currents on Earth reaching a depth of 1000m and attaining a maximum speed of 9km per hour. The Agulhas is usually no more than 100km wide and broadly follows the outer edge of the continental shelf, shifting warm water, sometimes 6°C higher than surrounding water, southwards. But the Agulhas can also meander and, in so doing, creates eddies and reverse currents that strongly influence oceanographic conditions off the KZN coast.

The Agulhas Current affects weather patterns, storm events & the diversity of marine life along the KZN coast.



The Agulhas Current contributes to the rich tropical biodiversity of our region and plays a crucial role in the distribution of much of our marine life. This boundary current also strongly influences our weather, especially storm events and rainfall. The Agulhas can create havoc, generating "giant" waves that have been known to cripple ships and impact the coast. The large Agulhas Current may seem to be out of sight, but it is usually there! On many days you will see a bank of cloud at sea that lies directly over the Agulhas.

ECOSYSTEMS

An ecosystem is a biological environment, including all its living organisms as well as the physical components with which the organisms interact. The KZN coast has many different ecosystems, some described here.

Sandy beaches

Some 80% of the KZN coast is dominated by sandy beaches, most of them located on the North Coast. Sandy beaches are dynamic and mobile ecosystems comprising sand particles, coral and shell fragments that are always on the move - the waves shifting sand along the shore as well as offshore, while winds move sand up the beach. This process is persistent but the scale of sand movement varies with the seasons. During stormy weather, seas "take" more sand and deposit it offshore, while during calm conditions gentle waves carry sand back to the beach. At first glance sandy beaches look barren. However, there is a remarkable amount of life tucked away between the sand grains. Animals in this ecosystem are specialised to deal with the harsh and dynamic conditions and typically include tiny crustaceans, worms and burrowing animals, such as molecrabs, clams, scavenging plough snails and the ubiquitous ghost crabs. Also at home are birds, such as the sand plover and to the north our sandy beaches are a critical ecosystem for turtle nesting.



Sandy beaches are always on the move - the waves continually lift & move sand.



Rocky shores are dynamic, being covered by the sea at high tide & exposed to the air at low tide.



Rocky shores

Much of the South Coast comprises rocky shores, either in the form of headlands, wide wave-cut platforms or simply as rocky outcrops separated by sandy shores. As rocky shores traverse the rise and fall of the tides, so the animals are exposed to different periods of inundation and exposure. This leads to vertical zonation with the hardest and most tolerant organisms highest up on the rocks. Four such zones can normally be recognised, with the lowest normally rich in seaweed. Typically, organisms on rocky shores are attached in some way and include barnacles, mussels, limpets and red-bait. More mobile animals include crabs, small fish, sea urchins and sea stars.

Our KZN Coast

Estuaries are productive systems that are critical for the survival of many species.



Estuaries

Estuaries comprise the unique zone where rivers meet the sea. They are highly variable systems that may experience water chemistry fluctuations, depending on tidal strength and river flow. Not surprisingly, animals and plants living in these environments are specially adapted. The KZN coast has more than 70 estuaries, ranging from very small streamlets to the largest of them all: the St Lucia estuary. Some estuaries in KZN are permanently open to the sea while most are temporarily closed by a sandbar.

It is difficult to define the estuarine area because of fluctuating salinities. It is generally accepted that the seaward boundary of the estuary is the high-water mark and the upstream boundary is the point where the system is no longer subject to tidal action or has no trace of salinity. The outer perimeter of estuaries is taken as the 5m height contour. Estuaries are among the most productive ecosystems and support a wide range of habitats such as nutrient rich mud banks, mangrove forests and seagrass meadows that in turn are critical for the survival of many species, especially providing refuge for the young. A unique range of animals, from burrowing prawns and shellfish to larger fish and birds, depend on estuaries as places to live, feed and reproduce.

Coastal vegetation

Coastal vegetation is unique in that it has to be resilient to the harsh salt spray, wind and unstable sand conditions of the coastal zone. However, this resilience allows vegetation to serve as a protective barrier to coastal vulnerability. Different vegetation types can be identified. There are colonisers that stabilise the shifting frontal dune which in turn allows other plants to establish over time. Coastal forests represent the final stage of such succession, comprising climax forest often found cladding the very high sand dunes in the iSimangaliso Wetland Park. Then there are the



Coastal vegetation serves as a protective barrier to coastal vulnerability.



mangrove forests which comprise several species specially adapted to live on the tidal fringes of estuaries, thereby providing nutrients and shoreline protection. In a few places, such as at Mapelane, unique fresh water swamp forests are found. Coastal wetlands also support salt marshes, comprising special plants that are highly salt resistant and able to generate considerable amounts of nutrients. Notably rare are coastal grasslands, of which only a few small patches remain. Clearly, protecting coastal vegetation has positive biodiversity implications and helps to protect our shorelines and sensitive dune systems.

Subtidal reefs

Along much of the KZN coast, just below the surface, are reef ecosystems. Mostly these comprise of rock heavily encrusted with marine life, but in the north (iSimangaliso Wetland Park), the reefs are covered with a rich layer of hard and soft coral. These reefs may be small or extensive and are invariably refuge to shoals of fish, rock lobsters and a wide diversity of other invertebrate animals. In KZN many reefs support endemic fish species, such as the seventy four, slingers and other bream-like species. Shallower reefs are usually covered with seaweed as the light penetration is better.



KZN reefs are an environmental asset that support a range of diversity.



The Sardine Run sees masses of sardines migrating to the cooler waters of KZN.

The Sardine Run

A spectacle not to be missed is the annual Sardine Run, alias "The Greatest Shoal on Earth". Each winter, in early June, enormous shoals of sardines migrate in from Cape waters into the cooling winter seas of KZN. This mass migration attracts an enormous number of gamefish such as elf/shad, garrick/leervis, Cape yellowtail, geelbek and dusky kob. Copper and dusky sharks also take advantage of this bountiful food supply as do common and bottlenose dolphins, whales and an armada of Cape gannets that rain down on the luckless sardines. When the shoals move close inshore, licensed commercial fishermen attempt to net shoals using beach seines and excited anglers try to catch the pursuing gamefish and sharks. This annual event injects major economic benefit through tourism into the region.

Marine reserves

Marine Protected Areas (MPA) are a management tool to safeguard our marine biodiversity, to protect critical hotspots and to look after our marine and coastal resources. They serve as sanctuaries from which marine life can disperse and restock other areas and are also valuable as reference sites against which the effects of man's disturbance on marine life can be measured. The KZN coast has four MPAs: St Lucia and Maputaland (as part of the iSimangaliso Wetland Park), Aliwal Shoal and Trafalgar. Each has a management plan that regulates activities within it. In most cases this does not prohibit fishing but instead limits the species and daily bag limits. Several other sections of coast are under some form of protection and, with time, more MPAs may be proclaimed in order to achieve the international standard of 10-15 % protection of coastal and marine ecosystems. Certain activities in MPAs require permits, such as diving. For more information contact the relevant authorities (see *Contact Details section, pg 30*).

Animals of the Coast and Sea

Our seas are home to a spectacular diversity of marine life. At least 2 500 species of fish have been recorded, five species of sea turtle, 28 types of whales and dolphins, more than 46 species of seabird and tens of thousands of invertebrate species, from tiny cryptic shellfish to larger lobsters and octopus. Sea turtles, amongst the most ancient of reptiles, are dependent on the coastal zone, with leatherback and loggerhead turtles nesting on northern beaches each summer. Several species of dolphin can be seen from the beach and whales can be sighted as they seasonally migrate along the KZN coast in considerable numbers.



Seabirds, too, enhance our coastal biodiversity. Notable is the small white-fronted sand plover that nests on our beaches, often at great risk to itself and its chicks. An endemic species to the southern reaches of KZN is the endangered African black oystercatcher.

Dangerous or not?

There is much misunderstanding about potentially dangerous animals. Certainly, some sea creatures can bite, sting or may be venomous, while others are poisonous to eat. Forewarned with a little information is all that is needed to avoid any unpleasant experience. Sharks are often feared yet an attack is highly unlikely if the basic precautions are adhered to. Moray eels have been known to bite the hand of an unwary diver as he reaches in a cave for crayfish.

Venomous creatures use spines, teeth or stinging cells to inject venom, which may be painful or even dangerous. For example, the stonefish is one of the most venomous fish and may be found in shallow waters along northern KZN regions. The spines of stingray and sea catfish also cause an adverse reaction to human flesh. Rarely, a sea snake may be encountered which, though venomous, is seldom able to inflict a bite unless provoked. Most problems are associated with common bluebottles and jellyfish, which can inflict a mild to moderately painful sting. If you have been

If stung by a bluebottle or jellyfish rinse the area in salt water.

“stung”, remove any pieces of tentacle and rinse the area in salt water (fresh water could make it worse). Treatment with vinegar and ice, or soaking the area in hot water, also brings relief. Although we may not like them, bluebottles are an important source of food for turtle hatchlings.

Be careful of creatures that are poisonous to eat - some can cause serious reactions and even death when eaten. The most deadly of these is the puffer fish, which contains neurotoxin in its organs and flesh.

Beached marine animals

From time to time larger marine animals are found “beached” on our shores. These include seals, turtles, cetaceans (dolphins and whales), seabirds and whale sharks. Animals may come ashore as a result of general trauma and starvation caused by disease and parasite infestation, harmful algal blooms (red tide), exposure to pollution (such as oil), injuries caused by ship strikes or entanglements with nets. Beaching may also occur after stormy weather or very rough seas which force animals ashore.

A marine animal is considered “stranded” when it is unable to return to its natural habitat without assistance. Animals that strand may be alive or dead, in groups (mass stranding) or as single individuals.

However, not all of these incidents are unnatural and in many cases the animals may simply be exhausted or taking a break. This is especially true of seals during the winter Sardine Run. Hence, it is best to leave the animals alone and contact Ezemvelo KZN Wildlife’s Fishcare hotline on +27 83 380 6298. They can protect and, if necessary, move the animal. The care and rescue of stranded animals is very specialised. The key is to prevent any further injury and keep the animal comfortable by minimising handling and disturbance, so it is best to contact the conservation experts. It would be most useful if you could provide details such as the exact location of the animal(s), the time and date of your observation and the name and contact number of yourself or someone at the site. If there are many animals involved, say what animal(s) are involved and, if possible, the condition of the animal(s), i.e. alive, dead or injured.

Remember these are wild animals and are under an incredible amount of stress. As a result they may act aggressively and bite or deliver an accidental smack with their tail. It is important to watch the animal until help arrives. Keep everyone away, be as quiet as possible, provide some shade if appropriate, keep dogs and other pets away and don't attempt to move the animal. In the case of dead seabirds and turtles you may want to check if the animal has been ringed or tagged, in which case you should inform Ezemvelo KZN Wildlife with details.



If you come across a beached animal it is best to contact the Fishcare hotline. Approaching the animal could startle or scare it, causing it to be aggressive.

Integrated Coastal Management



The Need for Integrated Coastal Management

The coastal zone is a highly complex environment with a wide range of goods and services, high-density populations, urbanisation and much infrastructure in support of economic development. This increased pressure diminishes the natural goods and services the coast provides and makes it and its people more vulnerable to the potential effects of climate change, sea-level rise and coastal erosion. Unless properly managed, there will be a loss of natural coastal assets as they are successively converted to man-made structures such as refineries, power stations, mining operations, ports, marinas, tourist facilities and residential developments.

Increased pressure on the coastal environment diminishes the goods & services the coast provides, making it & its people more vulnerable to the effects of climate change, sea-level rise & coastal erosion.

The coast therefore needs to be managed as an integrated system in order to make optimal use of the opportunities and services it provides. In light of these pressures on the coastal environment, and in keeping with international best practice, South Africa has developed and enacted the ICM Act. This piece of legislation is very important for the KZN coastal zone in that it ensures integrated/holistic management of the coastal and estuarine environments and entrenches the principles of co-operative governance.

About the Integrated Coastal Management Act

The National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008) was signed into enforcement on 1 December 2009. Most environmental policy and legislation is set at national level and falls under the umbrella of the National Environmental Management Act (NEMA), 1998. The ICM Act represents the culmination in the development of a management regime that started with a position Green Paper and was followed by a policy White Paper endorsed by Parliament. The ICM Act establishes a system of integrated coastal and estuarine management regimes that protects the coastal environment and the maintenance of its natural functioning, while ensuring that development and the use of coastal resources is sustainable and sympathetic to prevailing coastal conditions.

The Act outlines a clear definition of the coastal zone, key to which is the determination of coastal public property and a coastal protection zone.

Coastal public property is land designated as such for use by people of the Republic - this is based on the principle that all people have a constitutional right to access and enjoy the coast. For the first time ownership of the coastal zone vests in the citizens of the Republic, is held in trust by the Government and is inalienable. Coastal public property broadly includes land submerged by coastal waters, the seashore, admiralty reserve* and state-owned land.



*Admiralty reserve is a strip of state-owned land approximately 45-60m wide inland of the high-water mark. This strip includes land owned by the State and/or where it is specifically described in title deeds of private land. The admiralty reserve is therefore not continuous along the coast. It was administered by the Seashore Act (No. 21 of 1935) until the enactment of the ICM Act and it is now included in coastal public property.

The **coastal protection zone** is established to ensure the protection of the ecological integrity, natural character and economic, social and aesthetic values of the coast. The coastal protection zone nominally includes land falling within 100m of the high-water mark in urban areas and within 1km in rural areas, unless otherwise determined by the MEC (Member of Executive Council).

The ICM Act calls for the development of a coastal management programme (CMP) at the national, provincial and local levels. These, aligned with each other, ensure integrated, holistic coastal management at all levels of government.

The ICM Act follows the principle of participatory management & calls for the public to participate in ensuring sustainable management & development in the coastal zone.

One of the core elements of the ICM Act is the role played by stakeholders. The Act attaches great importance to the principle of participatory management, whereby all parties that have jurisdiction over the area in question should be consulted. It also calls for the public to participate in management changes in the coastal zone. This ensures that you, the public, has a voice in the management of our coast.

Integrated Coastal Management



Principles of the ICM Act

PRINCIPLE	DETAILS
National Asset	The coast should be retained as a national asset, with public rights to access and benefit from the many opportunities provided by coastal resources.
Economic Development	Economic development opportunities should be optimised to meet coastal social needs and to promote the wellbeing of coastal communities.
Social Equity	Coastal management efforts should ensure that all people, including future generations, enjoy the rights of human dignity, equality and freedom.
Ecological Integrity	Coastal diversity, health and productivity must be maintained and, where appropriate, rehabilitated.
Holism	The coast must be treated as a distinctive and indivisible system. Interrelationships between coastal users, ecosystems, the terrestrial and marine environments should be recognised and managed.
Risk Aversion & Precaution	Coastal management needs to adopt a strategy of risk-averse and precautionary management under conditions of uncertainty.
Accountability & Responsibility	Coastal management is a shared responsibility and all people must be held accountable for the consequences of their actions.
Duty of care	All people and organisations must act with due care in order to avoid negative impacts on the coastal environment and its resources.
Integration & Participation	A dedicated, co-ordinated and integrated coastal management approach must be developed and conducted in a participatory, inclusive and transparent manner.
Co-operative Governance	Government, private sector and civil society must form partnerships to ensure co-responsibility for coastal management and to empower stakeholders to participate effectively.

Chapters of the ICM Act

1: Interpretation, objectives and application of the Act	7: Protection of coastal resources
2: The coastal zone	8: Marine and coastal pollution control
3: Boundaries of coastal areas	9: Appeals
4: Estuaries	10: Enforcement
5: Institutional arrangements	11: General powers and duties
6: Coastal management	12: Miscellaneous matters

You and the Integrated Coastal Management Act

The Act places responsibility on all spheres of government and also the public. Hence, it is imperative that people living and working in the coastal environment have a sound understanding of the issues and risks associated with this unique environment.

What part of the Act applies to me, as a member of civil society?

SECTOR	CHAPTER											
	1	2	3	4	5	6	7	8	9	10	11	12
Industry												
Business community/tourism												
NGOs/CBOs												
Legal fraternity												
Environmental practitioners												
Surveyors												
Scientific/academic community												
Coastal property owners/developers												
Vessel owners/operators												
Coastal lease holders												

Accessing and Enjoying the Coast



Reasonable access to & use of the coast is provided for all citizens BUT it comes with a duty to protect and not to cause adverse impacts on the coast.

The Act is very clear on access to the coast, confirming that citizens should have reasonable access to the coast so as to enjoy its benefits. However, this comes with a duty to protect it and not to cause adverse impacts on the coast and others who use it. Municipalities are working towards establishing appropriate access points that ensure fair access for all while minimising impacts on the coastal environment. The Act also envisions that public amenities such as parking lots, ablution facilities and boardwalks are provided and maintained by municipalities.

Driving in the coastal zone

Public recreational beach driving was banned in 2001 because of the considerable environmental risk it presented. In some cases vehicle traffic led to the degradation of coastal dunes, causing loss of habitat and natural coastal defences.

Vehicle access to the coastal zone is now controlled by the National Department of Environmental Affairs through the application and issuing of permits². People can apply for permits for specific uses which they feel may require vehicles in the coastal zone, such as organised recreational sport fishing competitions held under the auspices of a recognised national or provincial sport fishing organisation. A physically challenged person may also need to use a vehicle to access the beach. The application process can be lengthy and appropriate time should be allowed for the processing of your application. Persons with a disability must provide a letter from the National Council for Persons with Physical Disabilities, certifying their impaired mobility (see *Contact Details section, pg 30*).



Permits for driving in the coastal zone can be obtained from the National Department of Environmental Affairs.

Any organ of state may use a vehicle in the coastal zone without a permit for the purposes of performing its public duties. Equally, the National Sea Rescue Institute (NSRI) and Lifesaving South Africa are allowed to access the coastal zone in the public interest. Persons launching boats are permitted to access officially registered launch areas under the regulations governing these sites.



Launching boats in the coastal zone

The lack of bays and inlets along the KZN coast has not deterred the development of a very active boating fraternity. Besides launching larger craft through the ports of Durban and Richards Bay, there is a thriving beach-based boat launching community, using specially designed skiboats, semi-inflatable craft and jetskis capable of launching through the rough surf zone. The safety of boat launching is controlled by the South African Maritime Safety Authority (SAMSA) which sets operational limits on boating. Vessels must be licensed for seaworthiness and persons taking vessels to sea must be in possession of a valid Skipper's Ticket³ for that class of vessel.

Launching of motorised vessels may only take place at recognised launch sites, which are authorised by the DAEA&RD and monitored by Ezemvelo KZN Wildlife in the interests of safety and resource management. These restrictions do not currently apply to non-motorised vessels such as paddle-craft (e.g. paddle skis, fishing skis, etc.) except in the iSimangaliso Wetland Park where all types of boat launching activity is restricted to designated launch sites. Valuable environmental information about boating and fishing activities is collected at licensed boat launch sites through a mandatory launch site register, which contributes to the sustainable use of the coast and its resources. For a list of official marine boat launching sites along the KZN coast, visit www.ori.org.za.

Remember, fishing off a boat means you need to be in possession of a fishing permit (see *Harvesting Marine Resources section, pg 24*) and the skipper will require a boat fishing permit.



If you wish to launch a boat anywhere in KZN you need to be in possession of a valid skipper's licence & your vessel must be licensed.

If you want to fish off your boat, you need to get a fishing permit.

Accessing and Enjoying the Coast

Swimming

There are great swimming beaches along KZN's coastline, but it is always best to swim at a protected beach that is designated for this purpose. These beaches have lifeguards on duty for your safety, although at some of the less popular beaches this is only at weekends or during school holidays.

It is best to swim at a protected beach, where lifeguards are on duty for your safety.



Shark nets

Although the incidence of shark attack is extremely low, some beaches along the KZN coastline do have large-mesh shark control nets and, from Hibberdene southwards, both nets and drumlines have been installed. These act as deterrents to sharks in these areas. Each net measures 214m x 6m deep and nets are laid parallel to the coast approximately 400m offshore and in water depths of 10-14m. Drumlines consist of a large anchored float from which a single baited hook is suspended. Most beaches are protected either by two nets or by one net and four drumlines, although the quantity of gear varies from beach to beach.

In KZN shark nets and drumlines are controlled by the KwaZulu-Natal Sharks Board, which has a commitment to minimise the environmental impact associated with protecting sea users from shark attacks. To this end, the Sharks Board is planning to replace some nets with more environmentally-friendly drumlines at beaches north of Hibberdene. During the annual winter Sardine Run the nets and drumlines may be out of the water for several weeks to prevent mortalities of animals which follow the sardines.



environmentally-friendly drumlines at beaches north of Hibberdene. During the annual winter Sardine Run the nets and drumlines may be out of the water for several weeks to prevent mortalities of animals which follow the sardines.



Shark nets help deter sharks at some swimming beaches. Shark nets are raised for several weeks during the annual Sardine Run.



If you want to dive, make sure you have the right certification & if diving in an MPA, make sure you get a permit.



Blue Flag beaches

Blue Flag is an international beach accreditation initiative, facilitated locally by the Wildlife and Environment Society of South Africa (WESSA) and participating municipalities. The programme evaluates beach conditions based on bathing water quality, environmental management, safety and services provided, and environmental information. The criteria are set by the international co-ordinators of the programme, the Foundation for Environmental Education (FEE). South Africa was the first country outside Europe to be granted Blue Flag accreditation for its beaches.

Look out for a Blue Flag flying at some beaches in KZN where the local municipalities are certified to have complied with the programme's criteria and standards. More information can be found at www.blueflag.org.za.



Snorkelling and diving

Thousands of people regularly enjoy the underwater realm of the KZN coast. They do so by snorkelling in tidal pools along the coast or, if they are more adventurous, dive with SCUBA (Self-Contained Underwater Breathing Apparatus) gear at several outstanding dive sites. In order to SCUBA dive you need to possess the relevant qualification acquired through a recognised SCUBA training agency such as PADI⁴ or NAUI⁵.

Some of KZN's dive sites are located within Marine Protected Areas (Aliwal and Sodwana) because they are home to an amazing array of underwater life. Diving in these sensitive areas requires a diving permit, which is obtainable from any Post Office (some dive operators have permits for sale). The proceeds from the permits are directed towards the conservation and management of these MPAs.

Coastline Changes

There are a number of physical factors that affect the coastal zone which in turn may have an impact on people and properties along the coast. These include climate change, sea-level rise, coastal erosion and changes in the position of the high-water mark.

Climate change

Climate variability may be unwelcome but it is a natural phenomenon that gives rise to cycles of drought, periodic floods, cyclones and El Niño events. However, there is growing evidence that human activities are accentuating climate variability through "global warming". This warming process is attributable to the greenhouse effect by which excessive naturally occurring greenhouse gasses are released into the atmosphere, causing superfluous trapping of heat and hence increased average temperatures. The Earth's average surface temperature has risen by approximately 0.6°C in the last 100 years, and the nine warmest years on record have all occurred since 1980. Such changes can lead to altered weather patterns, including rainfall and storm events. Changes in climate will affect society, the economy and the biophysical environment. In KZN it is anticipated that coastal areas will be wetter and there will be increased episodic storm events.

Our daily activities contribute to climate change, which will in turn affect all aspects of our lives.



Sea-level rise will lead to a loss of land, threatening properties & residents of coastal areas.

Sea-level rise

One of the impacts of climate change is a change in sea level, attributable to the melting of polar ice and the thermal expansion of water as it heats. The Intergovernmental Panel on Climate Change (IPCC) estimates global sea-level rise at 3mm per year while research along our KZN coast suggests sea-level is rising at about 2.7mm/yr. Although changes in sea level have taken place over time, this accelerated rise will in a shorter time result in submergence of land and threaten properties and coastal areas. In particular, storm events will have a greater impact on the coast. It is certainly a concern that within four generations sea levels are likely to rise as much as 30cm.



Coastal erosion

Coastal erosion is the natural weathering of rocks and the removal of beach sand or dune sediments by wave action, tidal currents or drainage. It is driven by storm events, cyclones, erratic weather patterns, sea-level rise or a combination of these and other factors. Guarding against excessive erosion are natural areas such as dunes, wide sandy beaches, vegetation and flood plains that act as the coastal environment's natural defences. If these are lost then the ability of the coast to absorb the impacts of extreme events is reduced, placing at risk parts of the coast, including natural assets, infrastructure and properties. Therefore, developments and people living at the coast should be careful not to remove, alter or damage these natural coastal assets, especially dune vegetation and dune systems.



In order to protect your property from coastal erosion DON'T remove any natural vegetation or disturb the dune system.



Changes in the high-water mark

An important defining feature of the coast is the "official" high-water mark. This line along the coast approximately coincides with the highest normal spring tide and is officially surveyed and proclaimed as such. However, due to the dynamic nature of the marine and coastal environments, the high-water mark constantly changes. Therefore the "official" high-water mark needs to be re-determined every so often. The ICM Act stipulates that in cases where the high-water mark moves inland due to sea-level rise, erosion or other processes, ownership of any land seaward of the newly determined and proclaimed high-water mark is deemed to be part of coastal public property and can no longer be owned privately. In the event that this happens, this could have serious implications for coastal property owners.

The position of the high-water mark may change over time... so be sure to know where it falls because land below this line cannot be privately owned.



Development in the Coastal Zone

Environmental authorisation

If you plan to undertake a development in the coastal zone, it is likely that your plans will require environmental authorisation in terms of the NEMA: Environmental Impact Assessment (EIA) Regulations. These regulations require the developer to appoint an Environmental Assessment Practitioner (EAP) to undertake either a Basic Environmental Assessment or a Full Scoping and EIA, depending on the nature of the proposed development. Details of activities that require authorisation are specifically listed in the relevant Gazettes. For instance:

- Basic assessment: activities of small footprint or low impact, such as the construction of canals, bridges or buildings exceeding 50m².
- Full assessment: activities of high footprint or high impact, such as the development of undeveloped or vacant land for residential, retail or commercial activities, where transformation exceeds 20 ha.
- Geographical exclusion: refers to specific geographical areas where activities that are not otherwise controlled will be identified, e.g. the construction of billboards and telecommunication masts seaward of the coastal development set-back line.



These listing notices are comprehensive and cover all aspects of development. Should you wish to undertake development of any kind it is best to consult an Environmental Assessment Practitioner (EAP) before initiating a development.

Any environmental assessment requires a public participation process whereby the public can comment on and provide input to the proposed activity. Thereafter the environmental authority (national or provincial, where applicable) will issue an Environmental Authorisation (positive or negative), depending on their adjudication. This assessment process ensures that the potentially adverse impacts on the environment are identified and avoided, and where they cannot be avoided are mitigated to reduce these impacts. Should environmental authorisation be attained, developers are obliged to follow best-practice in terms of design, materials and building methods.

Repair or removal notice

If developments are undertaken without authorisation or existing structures are shown to have an adverse effect on the coastal environment, then a repair or removal notice may be issued in terms of the ICM Act by the MEC. This will compel the owner to remediate or remove the structure and rehabilitate the area, as directed.

Set-back lines

A coastal set-back line is a line seaward of which development is controlled and only coast-dependent activities can be considered. This will ensure that developments are undertaken in such a way as to minimise impacts on the coastal environment. Set-back lines also serve to protect coastal properties from the effects of sea-level rise, coastal erosion and coastal flooding. They ensure that the ecological functioning of the coast is sustained for future generations to enjoy, and that people and developments are protected from the increasing vulnerability of the coastal zone to natural forces and the effects of climate change.



Set-back lines protect the natural environment & coastal properties from damage.



Protection of properties

In terms of the ICM Act, no protection measures against the effects of coastal erosion, sea-level rise or changes in the high-water mark can be undertaken on coastal public property. This is so that protection measures do not interfere with the natural functioning of the coast. Persons who wish to protect their own properties against such impacts may be allowed to do so at their own cost, on their own property. It is best to contact an EAP to determine whether any environmental authorisation is required.

Emergencies

Where your property may be at immediate risk you should contact the DAEA&RD for urgent advice and authorisation to undertake soft engineering measures.

Soft engineering

Soft engineering options should be utilised for coastal protection as these are best suited to work with the natural functioning of the coastal environment. An example of soft engineering is geofabric sand bags along the immediate front of the dune system - they should be as high as the original foredune and covered with appropriate sand fill to a gradient not more than 24°. The dune should then be vegetated with suitable dune species. Remember that any hard engineering measures will in all likelihood be subject to environmental assessment.



Harvesting Marine Resources

KwaZulu-Natal has a rich coastal and marine environment with hundreds of species potentially available for harvest, as a source of food and/or for recreation. These resources include fish such as shad/elf, king mackerel/cuda and slinger as well as invertebrates such as East Coast rock lobster, mussels and oysters. Regulations are in place to protect these resources from over-fishing. In addition, permits are issued which specify certain conditions, e.g. closed areas, closed seasons, bag limits and size limits. If you wish to harvest any marine resource, including in estuaries, it is important to purchase the necessary permits from a Post Office. Details of the specific regulations for each species you intend harvesting can be found on www.daff.gov.za. Permits are not transferable and must be available for inspection at all times.

Line-fishing

Line-fishing refers collectively to general angling, spear-fishing, vessel fishing, collection of bait and aquarium fish, cast-netting, etc. There are many fish and shark species that can be caught by line-fishing along the KZN coast, some of which are seasonally abundant. This diversity means that the KZN coast offers considerable fishing opportunities, ranging from basic subsistence harvesting for food security, to recreational, charter and commercial fishing. Persons who have a recreational fishing permit are not allowed to sell fish. Only legitimate commercial fishers, who have fishing rights, may sell fish commercially and permitted subsistence fishers may trade their catch within their community only.

Unfortunately, many line-fish species have been over-exploited in the past or are naturally scarce and thus especially threatened. Strict controls, through the issuing of permits as outlined above, are therefore in place to protect vulnerable species and to ensure sustainable use. It is important to be familiar with the rules and regulations, including the correct identification of species, how your catch should be measured, prevailing catch limits, closed seasons, etc.

A number of regulations are in place to ensure the protection of our fisheries - please be aware of these if you are a keen fisher.



Other marine resources

There are a great number of other marine resources that can also be harvested along the KZN coast. These include mussels, oysters, crabs, East Coast rock lobsters and octopus. Also popular are several bait species, such as sand prawns, mud prawns, red-bait and mole-crabs. To ensure sustainable utilization of these resources, permits are required - available from any Post Office. For KZN, permits include: East Coast rock lobster, mud crab, mussel, oyster and general bait.

Specific regulations apply to each species in terms of size limits and bag limits as well as the methods allowed for harvesting. It is your responsibility to be in possession of the appropriate permit/s and to have a good understanding of the regulations pertaining to the species which you plan to harvest.

Are you fish-friendly?

Given that many resources are depleted, several initiatives have been introduced that provide certification of their conservation status. Globally there is the Marine Stewardship Council (MSC) which certifies fisheries that have been comprehensively assessed and audited, including their stock status, the environmental effects of fishing and the management measures in place to protect such species. Look out for their logo when next you purchase fish.



Locally there is the Southern African Sustainable Seafood Initiative (SASSI), which aims to inform and educate people about their choice of seafood by grouping species into categories of vulnerability: **Green** (Best Choice) - the most sustainable choice; **Orange** (Think Twice) - these species may have sustainability concerns; and **Red** (Don't Buy) - avoid because they are from unsustainable populations, have extreme environmental concerns or are illegal to sell. To find out where a particular species is grouped simply SMS the name of the fish to FishMS (+27 79 499 8795). Visit www.wwf.org.za/sassi for more information.



The SASSI initiative helps you to make the best choice when buying fish.



Disturbing Ecosystems

Our coast has a range of ecosystems. Human interference often results in adverse impacts on these systems. Some examples are sandwinning, fresh water extraction, artificial estuary mouth breaching and changes to natural vegetation.

Sandwinning upsets the natural functioning of coastal systems. Do your part and report any suspected illegal sandwinning to the DMR.

Sandwinning

In KZN there is considerable extraction of sand from river beds, estuaries and coastal areas, mostly for building purposes. However, sand also has an important coastal ecosystem function by constantly replenishing our beaches and sustaining the sandy beach ecosystem.

Excessive removal of sand has been shown to result in depleted beaches and thus higher levels of vulnerability to storms. In law, sandwinning is in fact considered a form of mining and is regulated under the Mineral and Petroleum Resources Development Act (No. 28 of 2002). A permit must be obtained from the Department of Mineral Resources (DMR) before any sand is removed.

Fresh water extraction

Fresh water is an essential ingredient for all aquatic and terrestrial life. It is particularly important to estuarine ecosystems where it influences the character and condition of the estuary, its salinity, circulation patterns, water quality and species distribution. Reduction in fresh water inputs can cause increased frequency of mouth closures, thereby limiting the recruitment of juvenile fishes from the sea, as well as increasing the extent of saline intrusion of permanently open systems. Impacts on large rivers that push fresh water far out to sea, such as the Thukela, are also important. These systems nourish unique and rich offshore muddy ecosystems that sustain many of our fisheries. As the demand for fresh water to meet domestic, industrial and agricultural needs increases, so the volume of water reaching estuarine and marine environments is reduced, which in turn adversely affects the supply of other goods and services. If we wish to continue drawing environmental benefits, fresh water resources must be managed not only to meet human demand but also to nourish estuarine and offshore ecosystems.

Fresh water is a precious resource & demand is constantly increasing. Think about the long-term effects next time you open a tap. Be responsible - use fresh water wisely.



Breaching the mouths of estuaries

Many estuaries in KwaZulu-Natal close periodically as part of their natural cycle, normally opening again after rain. When closed, upstream flooding may occur, causing damage or loss of infrastructure and amenities located within the floodplain of the estuary. However, this is mostly attributable to poor planning, not because the system has not breached naturally. In response, there is pressure on authorities to artificially breach these estuaries. However, many species are adapted to live in these temporarily open-closed systems and have life cycles that are dependent on the natural opening and closing of the system. The closed phases of estuaries are generally also more productive than the open phases. It follows that artificial breaching of the estuary mouth (by opening the sandbar) will result in species being exposed prematurely to the marine environment, thus preventing them from successfully completing their natural life cycle. Artificial breaching may also make a system less productive and less able to deliver goods and services. Artificial estuary breaching is not allowed and can only occur under special circumstances with permission from Ezemvelo KZN Wildlife.

The functioning of estuaries & their ability to deliver goods & services is affected by artificial mouth breaching.

Changes to natural vegetation

Coastal vegetation provides a protective buffer to the coast, rendering it less vulnerable to impacts, and contributing to its biodiversity and provision of goods and services. The clearing of natural vegetation for urban developments, overgrazing, cultivation of river banks and flood plains is increasingly a cause for concern. Destruction of vegetation leads to higher silt loads in our coastal waterways, causing estuaries to silt-up and leading to degradation of these systems.

Also of concern is invasive alien vegetation that tends to consume more water than natural vegetation, resulting in reduced water yields. It is estimated that in some areas alien vegetation reduces stream flow by as much as 10%. So next time you plant something in your garden choose an indigenous plant and help conserve water resources.



Remember to leave natural vegetation intact as this helps protect the natural coastal environment. Plant indigenous vegetation as this uses less water.

Harvesting of natural coastal vegetation must be sustainable in order to prevent the loss of important habitats. For example, mangrove forests are harvested for their wood products such as charcoal, firewood and timber, leading to the increased loss of this valuable and threatened habitat.

Pollution and Litter

Marine pollution

Pollution is the introduction of harmful substances into the natural environment as a result of human activities. Marine pollution is more than an eyesore - it is an environmental, economic, health and aesthetic problem affecting marine and coastal environments around the world. Pollution can be intentional or accidental, it can be derived from one point or from a range of sources and it can be once-off or cumulative. In short, it includes a range of different human-induced environmental disturbances and the KZN coast is not immune to it. Sources of pollution along our coast range from industrial and domestic waste discharges (like sewage) to terrestrial run-off (including agricultural waste, pesticides and fertilisers) and other contaminants. These find their way into rivers and estuaries and eventually the coastal zone, causing degradation and loss along the way.



Pollution causes adverse effects for both the natural environment & you the user of the environment. So think before you discard waste.



Sewage pollution affects people's immediate environment and causes water-related illnesses such as cholera. It also introduces excessive amounts of nutrients to the estuarine and marine environments. Similarly, chemical fertilisers that are used by farmers drain into rivers and make their way to the estuarine and marine environments where they add to this "fertilising effect", resulting in algal and plankton blooms. These blooms are problematic because they remove oxygen from the water, often to the point that fish and other aquatic animals suffocate and die.

Marine litter

Marine litter is derived from marine and land-based activities. Solid waste enters the marine environment from poorly managed dump sites adjacent to rivers or coastal areas, together with wind blown refuse and litter collected in stormwater systems. Most of the litter consists of material that does not degrade so the continued input of these accumulate in the marine and coastal environment. Plastics are a particular problem for marine mammals, turtles and birds as they ingest or get entangled in it.

Almost everything we use from cigarettes to washing detergents to spilled fuel, oil, brake fluid and other waste eventually end up in the marine environment - even if you are kilometres away from the coast.

It takes many years for our litter to degrade...



International Coastal Cleanup

Debris, litter and pollution persist in the marine environment, fouling beaches and threatening our health. As a result, the International Coastal Cleanup was started in which volunteers from more than 90 countries give time to clean up their beaches and marine environment. The aim is that this not only cleans our beaches, but educates people and encourages changes in behaviour which causes pollution, litter and debris in the first place.



To get involved in the International Coastal Cleanup contact Ezemvelo KZN Wildlife.

Oil spills

An oil spill occurs when large amounts of crude or refined oil seeps or pours into the sea. This can happen at the site of drilling, during transportation and as a result of accidents, often causing huge environmental impacts. In terms of the Marine Pollution Control Act (No. 6 of 1981), the SAMSA facilitates the development of Coastal Oil Spill Contingency Plans for each of a number of zones around the South African coast. These plans ensure preparedness and a co-ordinated response strategy to major oil spills. Should you witness an oil spill be sure to contact SAMSA.

The short-term impacts of oil are devastating - tarred beaches, dead wildlife, loss of fisheries and contaminated water supplies. Moreover, in the long-term toxic materials remain in the water, building up in the food chain to lethal levels. This eventually disrupts or destroys ecosystems.

Oil spills are not only the result of large scale spills - every day activities also play a role. When you change your car's oil be careful not to dump the used oil on the ground or down a waterway as this all ends up in the sea. If you added up all the oil dumped on land it would surpass a serious oil tanker spill.



Oil 'spills' are also the result of our daily activities ... so think before you dispose of your car's oil.

Contact Details

Roles & Responsibilities	Contact Details
Department of Environmental Affairs: Oceans and Coasts	
Lead agent for coastal management in South Africa.	Website: www.environment.gov.za Call centre: +27 86 111 2468
Beach driving permit applications.	Phone: +27 21 819 2493
Department of Mineral Resources	
Authority responsible for mineral resources in South Africa.	Website: www.dmr.gov.za Phone: +27 31 335 9600
Department of Agriculture, Forestry and Fisheries	
Custodian of marine biodiversity in South Africa.	Website: www.daff.gov.za Phone: +27 12 319 6000 KZN Office: +27 31 368 2223
Department of Water Affairs	
Custodian of South Africa's water resources.	Website: www.dwa.gov.za KZN Office: +27 31 336 2700
KZN Department of Agriculture, Environmental Affairs and Rural Development	
Lead agent for coastal management in KZN tasked with the implementation of the ICM Act.	Website: www.kzndae.gov.za Head Office: +27 33 355 9434/8 Ugu: +27 39 682 2040 eThekweni: +27 31 302 2800 iLembe: +27 32 437 7500 uThungulu: +27 35 792 1624 uMkhanyakude: +27 35 572 1011
Ezemvelo KZN Wildlife	
Protects marine biodiversity, implements the Marine Living Resources Act and manages the Aliwal Shoal and Trafalgar MPA's.	Website: www.kznwildlife.com General enquiries: +27 33 845 1999 Coastal Office: +27 31 274 1150 Email: webmail@kznwildlife.com
iSimangaliso Wetland Park Authority	
Authority of the iSimangaliso Wetland Park (a World Heritage Site) and manager of the St Lucia and Maputaland MPA's.	Website: www.isimangaliso.com General enquiries: +27 35 590 1633 Email: info@isimangaliso.com
South African Maritime Safety Authority	
Responsible for marine safety in South Africa.	Website: www.samsa.org.za Durban Office: +27 31 307 1501 Richards Bay Office: +27 35 788 0068
National Sea Rescue Institute	
A voluntary non-profit organisation tasked with saving lives at sea.	Website: www.nsr.org.za KZN Office: +27 31 361 8567 Emergencies: +27 82 380 3800
KZN Sharks Board	
Provides protection against shark attacks at popular swimming beaches in KZN.	Website: www.shark.co.za Phone: +27 31 566 0400
Oceanographic Research Institute	
Undertakes marine and coastal research.	Website: www.ori.org.za General enquiries: +27 31 328 8222

District Municipalities	
Ugu	Website: www.ugu.gov.za General enquiries: +27 39 688 5700
eThekweni Metro	Website: www.durban.gov.za General enquiries: +27 31 311 1111
iLembe	Website: www.ilembe.gov.za General enquiries: +27 32 437 9300
uThungulu	Website: www.uthungulu.org.za General enquiries: +27 35 799 2500
uMkhanyakude	General enquiries: +27 35 573 8600
Local Municipalities	
Hibiscus Coast	Website: www.hcm.gov.za General enquiries: +27 39 682 2000
Umzumbe	Website: http://umzumbe.local.gov.za General enquiries: +27 39 972 0005
Umdoni	Website: www.umdoni.gov.za General enquiries: +27 39 974 1061
KwaDukuza	Website: www.kwadukuza.gov.za General enquiries: +27 32 946 2711
Mandeni	Website: www.mandeni.gov.za General enquiries: +27 32 456 8200
uMlalazi	Website: www.umlalazi.org.za General enquiries: +27 35 450 2082
uMhlathuze	Website: www.richemp.org.za General enquiries: +27 35 907 5000
uMfolozi	General enquiries: +27 35 580 1421
Mtubatuba	General enquiries: +27 35 550 0069

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