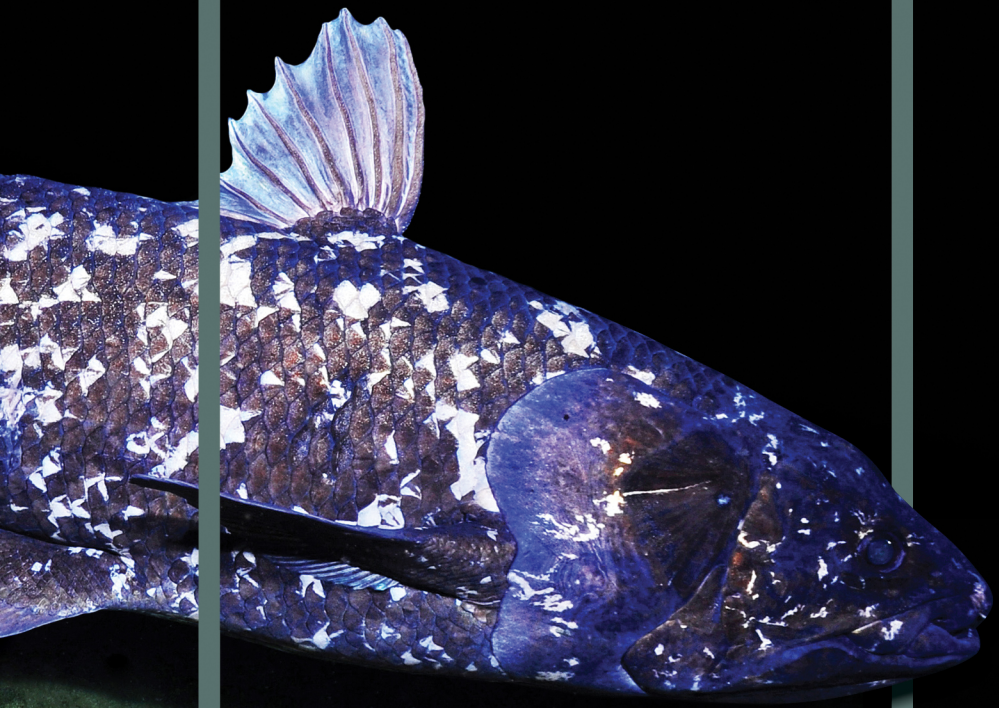
South Africa's New

MARINE PROTECTED AREAS



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MARINE PROTECTED AREAS

By

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SANBI
Biodiversity for Life
South African National Biodiversity Institute

Pretoria
2019

Editor:	Nicole Meyer
Proofreader:	Nicole Meyer
Design & Layout:	Elizma Fouché
Front cover photograph:	Peter Timm
Inside front cover photograph:	Peter Chadwick

Recommended citation:
Sink, K., Adams, R. Mann, J., Whitehead, O., Franken, M. & Maze, K. 2019. South Africa's New Marine Protected Areas. South African National Biodiversity Institute, an entity of the Department of Environmental Affairs, Pretoria.

ISBN: 978-1-928224-31-0

Obtainable from: SANBI Bookshop, Private Bag X101, Pretoria, 0001 South Africa
Tel.: +27 12 843 5000 ■ E-mail: sanbibookshop@sanbi.org.za ■ Website: www.sanbi.org

Printed by:

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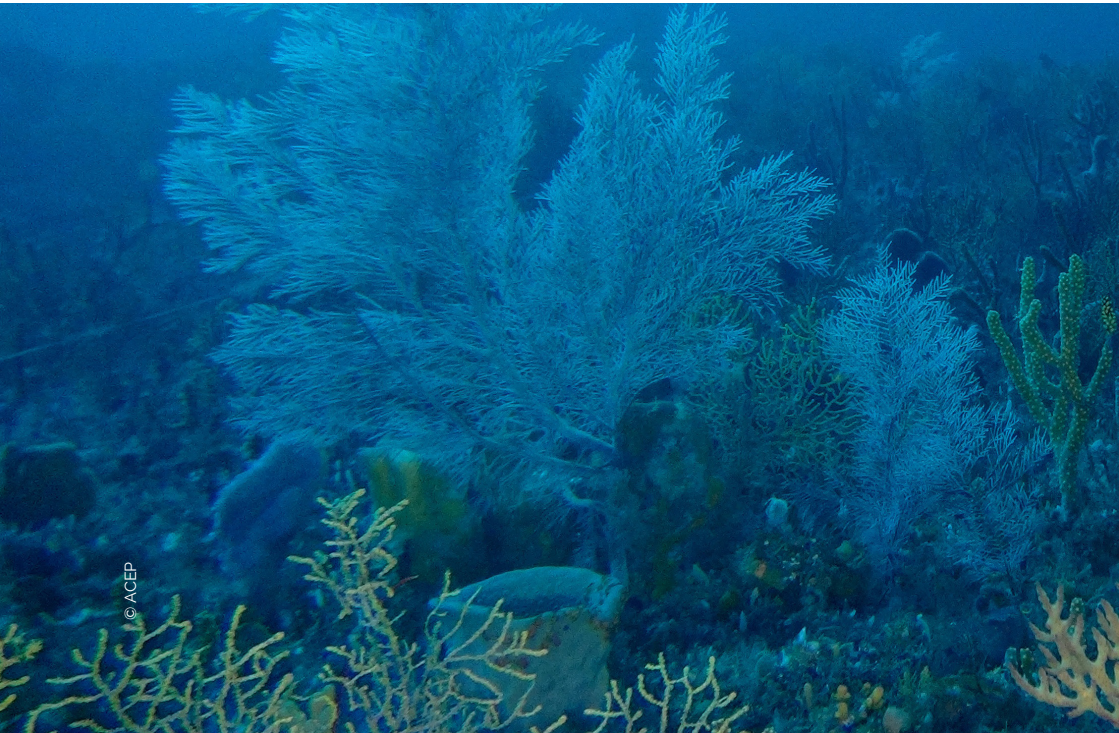
Abstract

In 2019 the South African Minister of Environmental Affairs approved the declaration of 20 new Marine Protected Areas (MPAs). This proclamation was the culmination of over 12 years of research by scientists from DEA, SANBI and a network of research institutions. The research identified areas of ecological and biodiversity importance in the South African EEZ. Through careful Marine Spatial Planning, ocean industries such as fishing, mining and shipping can co-exist with marine protected areas, and in the case of fisheries, even benefit. The government's initiative of *Operation Phakisa*, meaning 'hurry up', fast-tracked the implementation of the planning of these MPAs. In this book each of the new MPAs will be introduced, highlighting their special features and why they are important.



List of abbreviations

ACEP	African Coelacanth Ecosystem Programme
DEA	Department of Environmental Affairs
EBSA	Ecologically and Biologically Significant Area
EEZ	Exclusive Economic Zone
IUCN	International Union for Conservation of Nature
KZN	KwaZulu-Natal Province
MPA	Marine Protected Area
NDP	National Development Plan
NMU	Nelson Mandela University
ROV	Remotely Operated Vehicle
SAAMBR	South African Association for Marine Biological Research
SANBI	South African National Biodiversity Institute
SDGs	Sustainable Development Goals
UKZN	University of KwaZulu-Natal

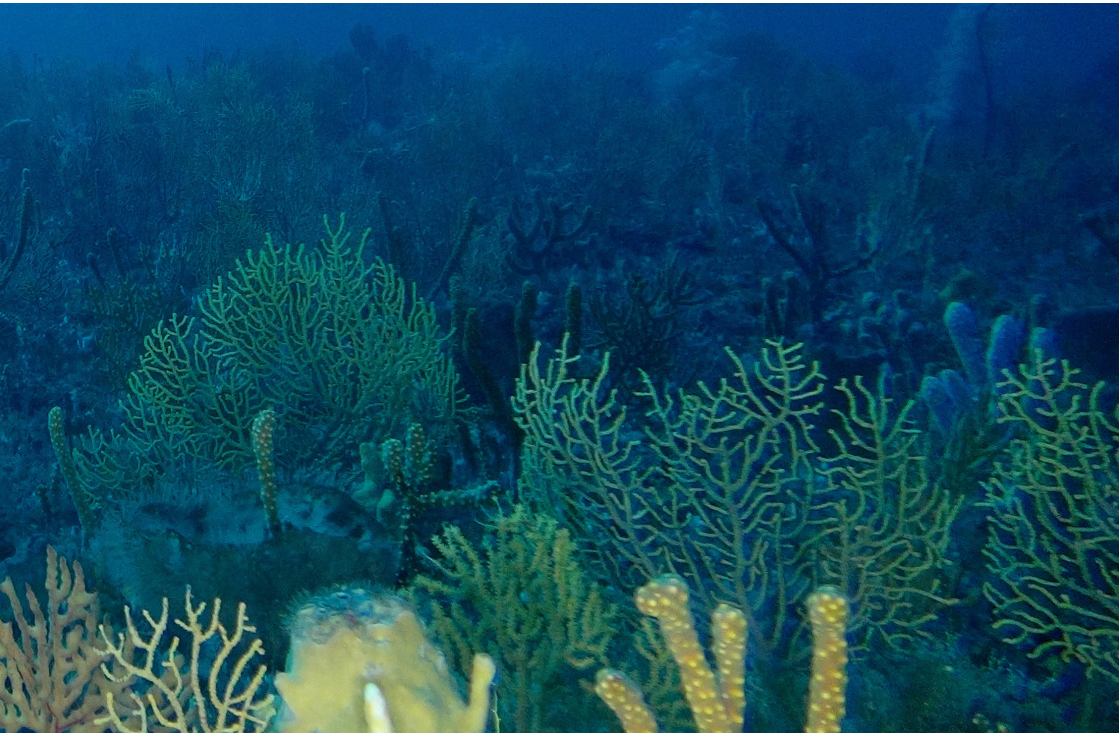


Figure 1. MPAs can provide jobs and supplement livelihoods where conserving species like southern right whales (top) can bring in revenue from the ecotourism sector and provide supplementary sources of income to local communities (© Peter Chadwick). Above: MPAs also create jobs linked directly to the MPA.

Benefits of Marine Protected Areas

What are Marine Protected Areas?

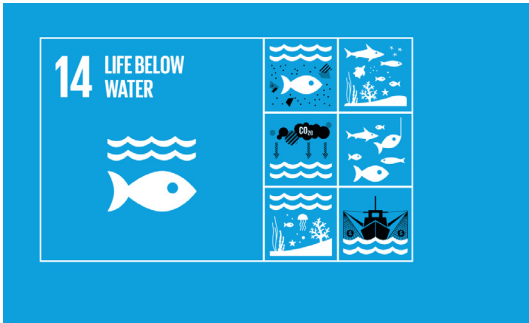
A Marine Protected Area (MPA) is part of our coastline or ocean that is specially protected for the benefit of people and nature. They are more than ocean nature reserves or national parks, because MPAs contribute directly to human wellbeing. MPAs help manage parts of the marine environment to promote fisheries sustainability, keep marine ecosystems working properly, and protect the range of species living there, helping people to benefit from the ocean. MPAs are an insurance policy for healthy ocean systems and economies, and are an investment in our future well-being.

For sustainable development and climate resilience

South Africa's MPAs contribute towards achieving the United Nations Sustainable Development Goals. They contribute to poverty alleviation, increase economic growth, support food and job security, maintain ecosystem resilience and are vital for coping with climate change.

Sustainable Development Goal 14:

Conserve and sustainably use the oceans, seas and marine resources



Fisheries sustainability

MPAs play a critical role in maintaining food and job security in South Africa by supporting sustainable fisheries. Fish stocks can recover in unfished areas where they can reproduce and grow undisturbed, spilling over into adjacent fishing grounds. Sustainable fisheries are economically valuable as they benefit from access to more lucrative international markets. South Africa's Marine Stewardship Council (MSC) certified hake fishery is worth R4 billion while 92% of employees are previously disadvantaged and 70% are women. Certification is estimated to increase the value of the fishery by 40% and provide an additional 12 000 jobs.

Development planning

MPAs can help streamline environmental authorisations and provide a practical approach to manage key parts of Ecologically and Biologically Significant Areas (EBSAs). By setting aside ecologically important habitats, other areas can be opened up for development. MPAs help provide greater certainty for development planning.

Figure 2. A Jacopever hiding in the complex habitat made by deep water corals Besides providing homes and nursery habitat, the microbial communities associated with corals are under investigation

Figure 3. *Cephalodiscus gilcristi* (Hemichordate) has been discovered to contain potent anti-cancer compounds.

Biodiscovery benefits

We are just beginning to unravel the many secrets concealed by our oceans. Protected areas conserve species of future importance and several marine species contain powerful medicinal compounds that may be key to biomedical research. The most effective compound ever tested against cancer was from a deep water marine animal found only in the Agulhas ecoregion of South Africa, *Cephalodiscus gilchristi*.

Social benefits

MPAs preserve special places for people. They provide areas to play, connect, learn and are sites for cultural and spiritual practices. MPAs may be zoned to allow low-impact harvesting, including traditional harvesting.

Figure 4. Many South Africans have powerful spiritual connections to the ocean where the sea is a place of cleansing and spiritual renewal (Kerry Sink).

Eco-tourism benefits

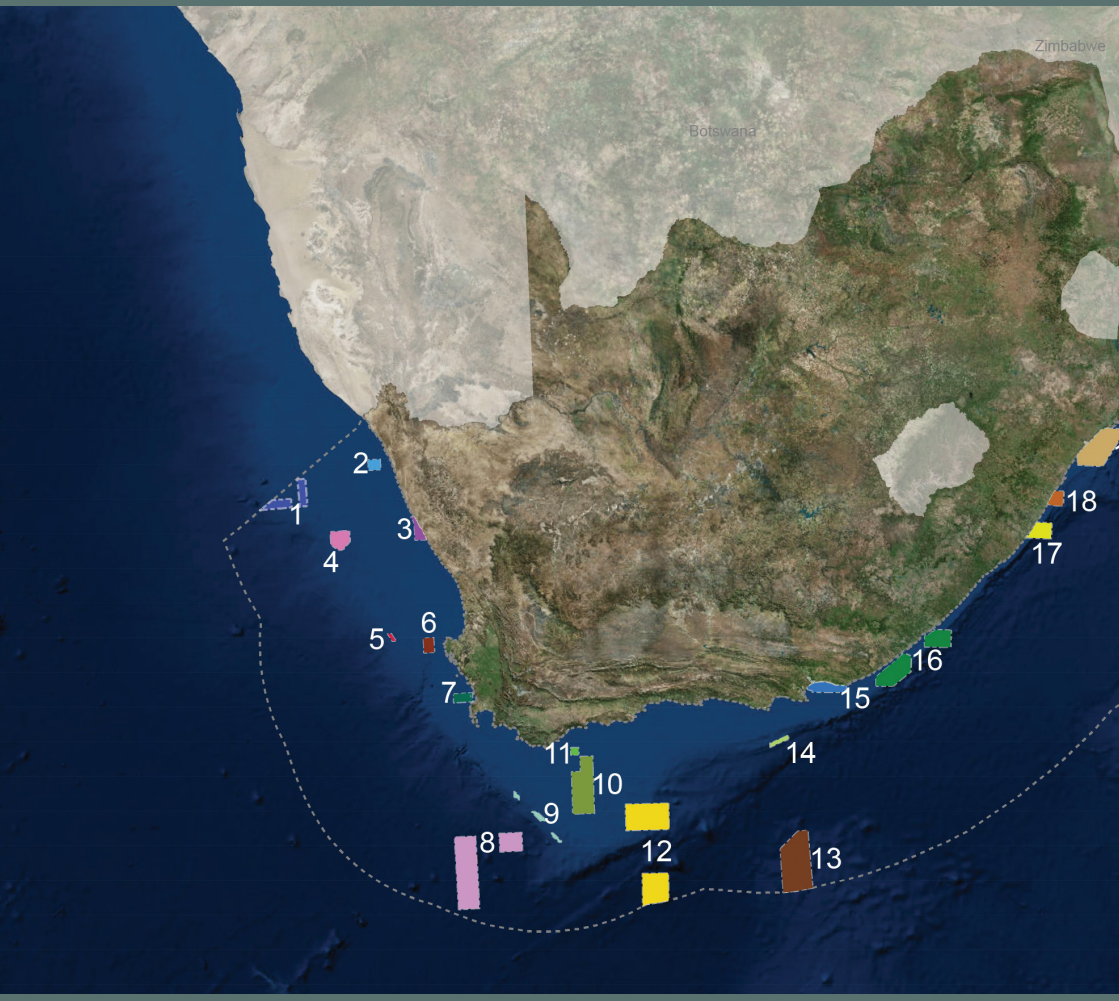
South Africa's diverse ocean and coast provides a wealth of ocean related activities that thousands of people, both local and international enjoy. Tourists come to hike, snorkel, scuba dive and see ocean wildlife such as whales, sharks and penguins. Protecting ocean wildlife benefits local economies, providing jobs and increasing revenue to the tourism sector.

Biodiversity benefits of MPAs

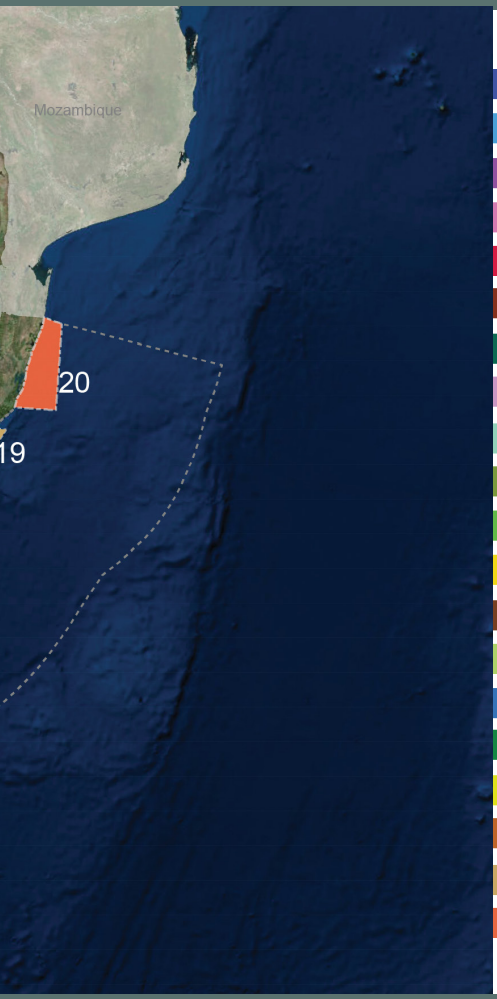
South Africa's new MPA network contributes to the fulfilment of South Africa's international agreements towards a target of 10% marine protection by 2020. The 20 new MPAs represent our ocean diversity as they include different ocean and current systems, depth zones and seabed types. Major advances in protection include:

- The first protection of offshore ecosystems;
- Protection of inshore ecosystem types that previously had no protection, like canyons, seamounts, abyss and plateaus;
- Protection of threatened ecosystem types that had little or no protection;
- Improved protection of fish spawning and nursery areas;
- Food provision for threatened species such as penguins and marine mammals.

South Africa's new **MARINE PROTECTED AREAS**



MPA maps source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNE/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.



1. Orange Shelf Edge MPA
2. Namaqua Fossil Forest MPA
3. Namaqua National Park MPA
4. Childs Bank MPA
5. Benguela Mud MPA
6. Cape Canyon MPA
7. Robben Island MPA
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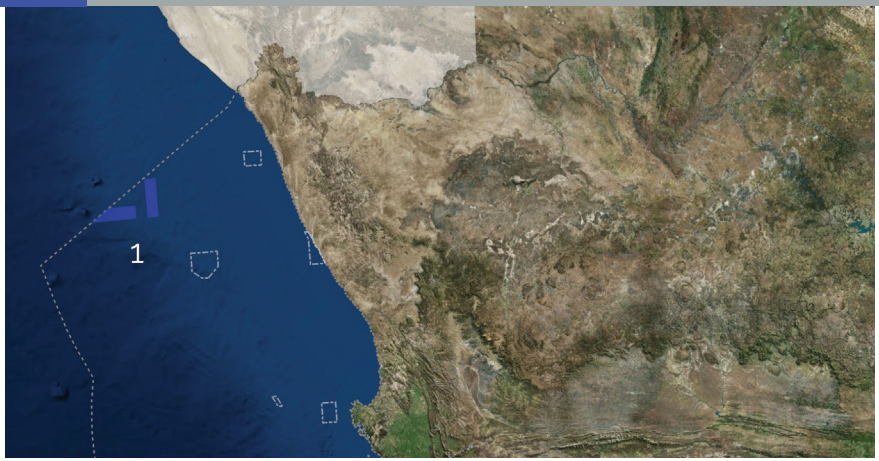
1. Orange Shelf Edge MPA

'Orange Refuge' ± 1 800 km²



The Orange Shelf Edge is an untouched MPA 150 km offshore, which is the last chance to protect Critically Endangered hard grounds and areas of sandy seabed in the southern Benguela that have never been trawled before. Threatened seabirds use this area to feed, while sharks glide in the waters below them. The Orange Shelf Edge MPA will make an important contribution to the sustainability of South African Hake fisheries, which are important for economic benefits, food and job security. This area is an essential site for further research, helping us detect change, build our knowledge of ocean industry impacts and understand the natural state of marine ecosystems.

Ecologically & Biologically Significant Areas

These MPAs help manage several Ecologically and Biologically Significant Areas (EBSAs)

EBSAs are recognized globally for their importance in terms of uniqueness or rarity, special importance for life history stages of species, importance for threatened, endangered or declining species and/or habitats, vulnerability, fragility, sensitivity, or slow recovery, biological productivity, biological diversity and naturalness.

Figure 5. The MPA will help manage fisheries resources like hake (left) and is important in maintaining the eco-certification of the hake trawl fishery (right).

Figure 6. This MPA protects both seabed and open ocean ecosystems including areas that are important for top predators like sharks (© Steve Benjamin).

2. Namaqua Fossil Forest MPA

'Submerged Yellowwoods' ± 500 km²

This MPA is 17 km offshore of Port Nolloth in the Northern Cape. The area hosts a unique fossilised yellowwood forest with sensitive cold water corals, unprotected mud habitat and sponge gardens. This MPA preserves clues to our past climate, supporting research to secure our climate future. It includes a nursery habitat for baby hakes, providing some protection in an important offshore diamond mining area. This protection also facilities eco-certification of the hake trawl fishery, which requires that the protection of young fish and management of fragile seabed habitats are considered to ensure sustainability of the fishery.

Modern technology to find ancient treasures

The fossils found in this area are from a new but extinct species of yellowwood tree *Podocarpoxylon jago*. These are named after the Jago submersible which discovered the fossils. The real yellowwood (*Podocarpus latifolius*) is our National Tree and is found in cool temperate areas like the forests of Tsitsikamma. The submerged fossilised yellowwoods on our West Coast hold clues to our past climate.

Figure 7. The Jago submersible discovered the fossilised forest with cold water corals at 120 m on the seafloor (Stevenson and Bamford 2003).

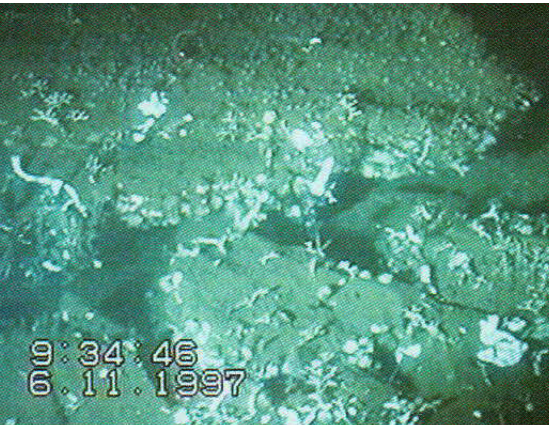


Figure 8. Fossilised yellowwood trees provide habitats for fragile cold water corals and tell us about a temperate climate in our past. Understanding past climate is key to predicting future climate trends (originally published in: Stevenson, I.R. & Bamford, M.K. 2003. Submersible-based observations of in-situ fossil tree trunks in Late Cretaceous seafloor outcrops, Orange Basin, western offshore, South Africa. *South African Journal of Geology*. 106: 315–326).

3. Namaqua National Park MPA

'Forests and Flowers' ± 550 km²

This coastal MPA is situated south of Hondeklipbaai in the Namaqua Region of the Northern Cape and is the first MPA for the Northern Cape. Planning for this MPA started in 1976. Namaqua ecosystem types will be protected, including several that are threatened. It will provide connectivity to an important arid area estuary and protection of giant kelp forests and deep mussel beds, sustaining an abundance of life. It will help protect valuable fisheries resources by preserving hake nursery areas and supports the recovery of overexploited West Coast rock lobster. The Northern Cape is known for its colourful displays of spring wildflowers and will benefit from increased marine ecotourism opportunities.

Figure 9. The MPA provides a refuge for West Coast rock lobster, assisting with the recovery of this over-exploited resource (© Geoff Spiby).

Climate Adaptation Strategies

This MPA is an important component of South Africa's climate adaptation strategy. Novel ecological research, detailed ecosystem mapping and monitoring has been taking place in this area since the 1980's. This provides baselines to understand human impacts and can tell us how harvesting, mining, and climate change affect our environment. This research also helps us detect and understand the impact of alien species, like European mussels and barnacles.

Figure 10. Due in part to protected area management, populations of African Black Oystercatchers have improved significantly and are no longer listed on the IUCN red list of threatened species (© Peter Chadwick).

Figure 11. This MPA supports ecotourism. Marine mammals that visitors come to experience include dolphins and Cape fur seals (© Peter Chadwick).

Figure 12. Kelp forests thrive on the nutrient-rich West Coast and support diverse inter-tidal communities (© Peter Chadwick).

4. Childs Bank MPA

'Coral Corner' ± 1 200 km²

Childs Bank MPA is a unique and sensitive seabed feature situated more than 100 km off Hondeklip Baai in the Northern Cape. Named after Captain Childs, who led a research team who discovered this flat top, steep-sided underwater hill in the 1970's, this MPA is home to fragile deep-water corals in the 200–300 m depth range. The seafloor fauna at Childs Bank is diverse with a kaleidoscope of sea stars, brittle stars, pancake stars and large basket stars, which stretch their branching arms to feed in the currents of the bank's steep walls. Despite trawling in some parts of the bank, some coral gardens remain intact on the steep sides of the feature. This MPA is essential for maintaining the eco-certification of the hake fishery as the importance of coral grounds as habitat and nurseries for baby fish is increasingly realised. Additionally, this MPA will help manage bycatch species that are accidently caught when other species are targeted.

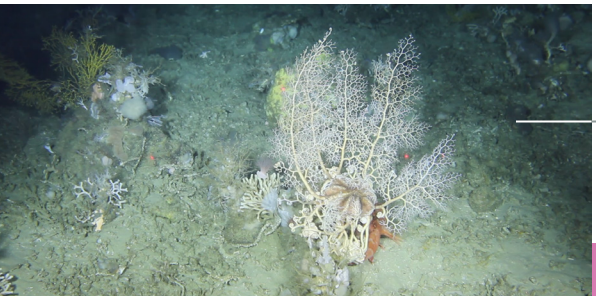


Figure 13. Large basket stars use their branched arms to feed in the currents of the bank's steep sides.

Fragile Deep-Sea Corals

Childs Bank has unique deep-water corals not known from any other MPA – the identity of which is still being scientifically investigated. Cold water corals **increase diversity** of seafloor communities by providing habitats and refuges for other species. These corals act as fish nurseries, where female fish use the corals to hold and keep their newly laid eggs safe. Many corals are very slow growing and highly sensitive to destructive activities like seabed mining, trawling and anchoring.

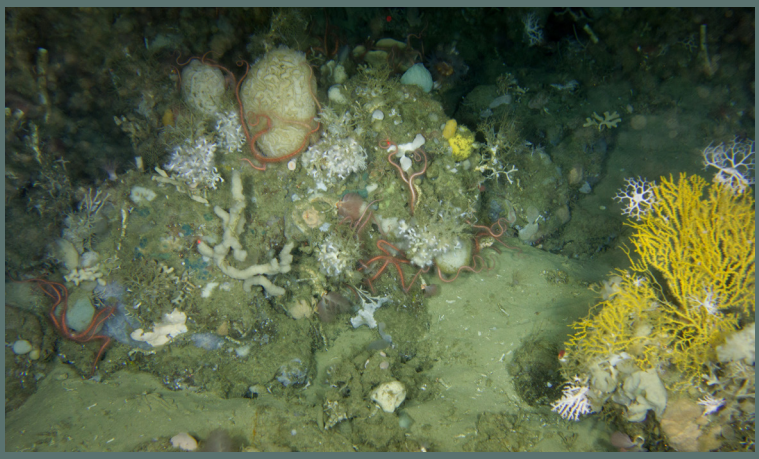


Figure 14. Sensitive cold water corals often increase seafloor diversity as other animals use them for shelter, food or points of attachment (© SAEON).

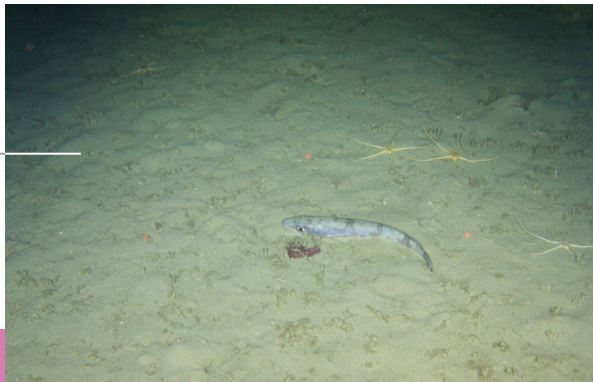


Figure 15. Deep habitats are critical in managing fish populations. Unfished areas can provide nursery areas, enabling populations to recover.

5. Benguela Mud MPA

'Magic Mud' ± 90 km²

This is the smallest MPA in the network and is situated offshore of Cape Columbine. This MPA is characterised by its deep muddy habitat that is considered threatened because the entire ecosystem type has been trawled. This part of the muddy ecosystem has only been lightly fished, making it the least trawled stretch of the deep muddy seabed on the West Coast. Protecting good condition mud habitats near fishing areas is important for maintaining fisheries eco-certification. Muddy ecosystems can take longer to recover than sandy habitats, particularly in deep water where natural disturbance is less frequent.

Changing the Status Quo

South Africa's marine realm was once the most unprotected realm in the country. Until the declaration of 20 new MPAs in 2019, only 0.4% of our ocean space was protected in marine protected areas. The implementation of new MPAs drastically improves this, providing 5% protection, a tenfold increase in a single leap! This means that we are on our way to achieving international protected area targets.

Figure 16. Deposit feeding worms (polychaetes) are key fauna in mud habitats, and use their long tentacles to collect food.

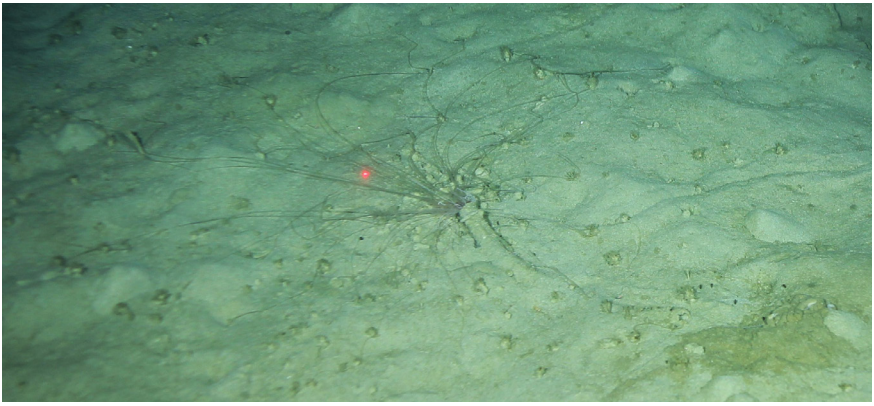


Figure 17. High numbers of brittle stars, sea pens and rattails were captured on the first camera survey of the MPA.

6. Cape Canyon MPA

'South Africa's Grand Canyon' ± 580 km²

Figure 18. The Canyon provides refuges for fish species like John Dory.

Offshore of Saldanha Bay in the Western Cape lies an enormous underwater canyon carved into the continental shelf, where cold nutrient-rich waters interact with a complex seascape to support the productive Benguela Marine System. Discovered in the 1960's and explored for diamonds in the 1980's, this deep feature supports fragile rocky habitats on which sensitive animals grow. The canyon is characterised by rocky, sandy and muddy habitats, home to a suite of different species, often in great abundance. This MPA is vital in protecting diverse seafloor communities and contributes to the protection of key fish species. Popular seafood species like hake, monk and John Dory reside on the soft canyon floor. The range of charismatic ocean wildlife in this MPA provides new ecotourism opportunities. This MPA protects important feeding grounds of seabirds, humpback whales and Cape fur seals - known to hunt at depths of over 400 m!

South Africa's Grand Canyon

Cape Canyon is known as South Africa's 'Grand Canyon'. The Cape Canyon is the longest and widest known canyon in South Africa at a length of 200 km. The maximum depth of the Canyon on the lower slope, at 3 600 m, is almost twice as deep as the Grand Canyon in Arizona, USA. The new MPA covers the most productive canyon head in the 180–500 m depth range.

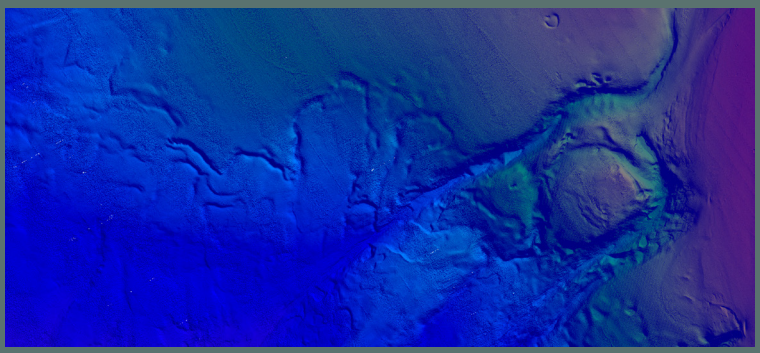
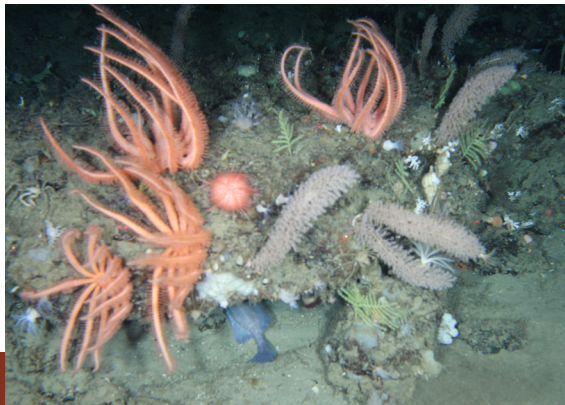


Figure 19. This seabed image of the Cape Canyon shows very complex seafloor features in the deeper part of the canyon.

Figure 20. Many albatross species travel thousands of kilometres to feed in the rich waters above the Cape Canyon (© Peter Chadwick).

Figure 21. The MPA protects diverse seafloor communities sensitive to disturbance, like these ancient brisingid sea stars and bottlebrush soft corals found to host fish eggs.



7. Robben Island MPA

'Island Treasures' ± 600 km²

In the vicinity of one of South Africa's busiest ports and surrounding a UNESCO World Heritage Site is an MPA that protects threatened island habitats and ensures a natural ocean legacy. The Robben Island MPA is a sanctuary for Endangered African Penguins, Endangered Bank Cormorants and Terns. Few people have seen the underwater beauty of its kelp forests, which teem with life and provide nutrients that underpin the complex food web that sustains the island inhabitants.

Figure 22. The MPA helps protect the African Penguin, an endangered species that is also an important ecotourism asset (© Peter Chadwick).

MPAs promote stock recovery

Robben Island is one of the few places to continue to support viable abalone stocks. *Haliotis midae* is an overexploited resource and protection of this area may promote stock recovery. This MPA also helps protect our West Coast rock lobster which needs help to recover. These important nearshore resources are considered in crisis, but well-managed MPAs can help these valuable stocks recover.

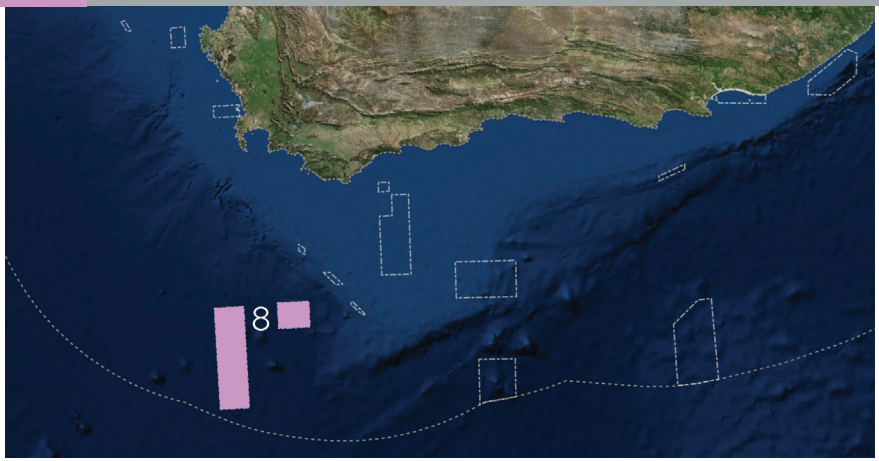
Figure 23. Populations of abalone, which have been overexploited elsewhere on the mainland coast, may have a chance to recover at Robben Island (© Peter Chadwick).

Figure 24. Robben Island is a UNESCO World Heritage Site and the MPA preserves our natural and cultural heritage (© Peter Chadwick).

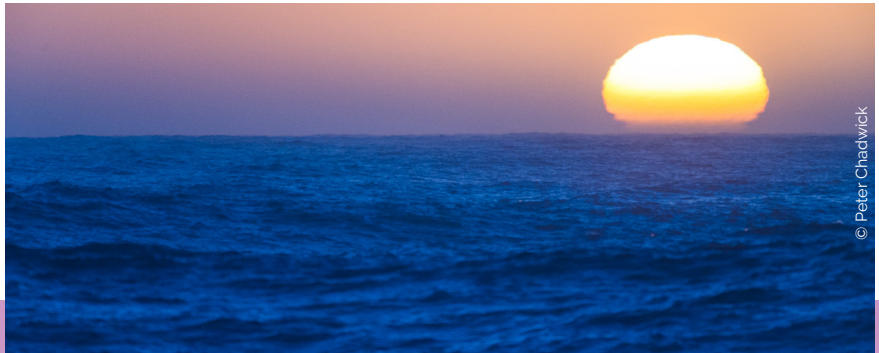
Figure 25. Kelp forests surround the islands and provide important habitats for several species (© Geoff Spiby).

8. Southeast Atlantic Seamounts MPA

'Mountains in the Sea' ± 7 700 km²



Just as parts of the Drakensberg Mountains are protected on land, this MPA provides the first protection of South Africa's volcanic undersea mountains. The MPA, situated more than 200km south of Cape Point, is divided into two parts to incorporate Protea and Argentina Seamounts in the west and an officially unnamed seamount (we call Mount Marek) in the east. Corals line the rocky slopes of seamounts while fish rely on seamount habitats for food and shelter. The deep sections of this MPA protect abyssal plains, the largest and least understood part of our planet, yet these areas have astounded scientists with their diversity and abundance of deepsea life. South African scientists still need to develop the technical capacity and experience to conduct research in the abyss.



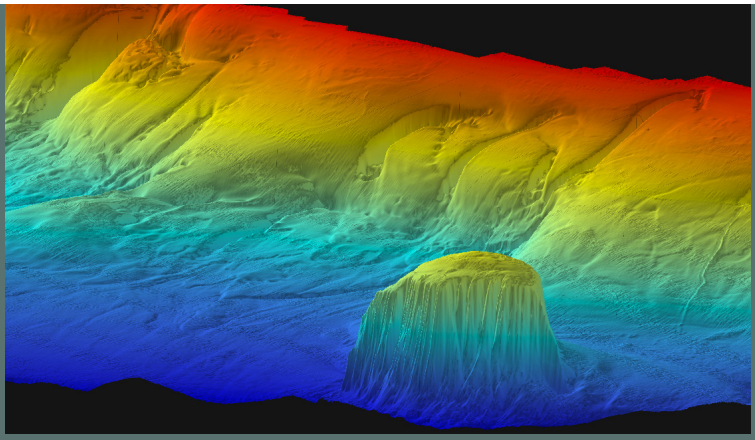


Figure 26. 'Mount Marek' is an undersea mountain on the slope. South African seamounts and their seabed biodiversity have never been sampled by scientists.

Unexplored Mountains in the Deep

Seamounts are globally recognised as biological hotspots supporting a dazzling array of marine animals, the ecology of which scientists are only just beginning to understand. South Africa's seamounts rise up from depths of more than 2 500 m, ascending to around 800 m at the shallowest point. The biological richness of seamount habitats is as a result of their shape with steep slopes that carry nutrients upwards from the depths of the oceans towards the surface.

Figure 27. Orange Roughy are protected in the deep waters of this MPA (© Lara Atkinson).

Figure 28. Threatened seabird species like this albatross, feed within this region.

9. Browns Bank Corals

'Coral Kaleidoscope' ± 340 km²

This MPA is situated offshore of Cape Agulhas and consists of three small areas. Several types of deep sea coral have been discovered here, including fossilised corals that hold clues to our past climate. This priority research area is being used by young South African scientists to study corals and potentially make amazing ocean discoveries. Hake spawn on the rough grounds of this MPA, where the bottlebrush corals provide nurseries for fish eggs and larvae. The protection of this area supports fisheries certification, contributing to food and job security.

Figure 29. Fossilised cold water corals have been discovered at Browns Bank.

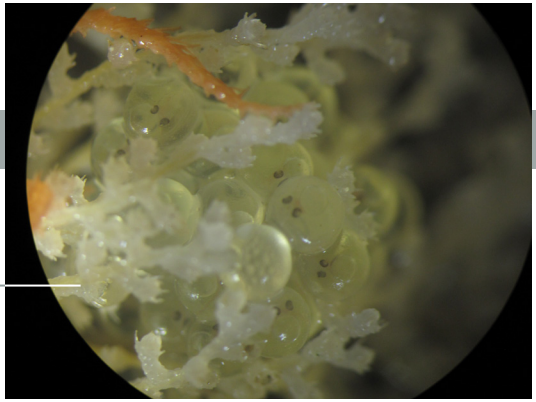


Figure 30. The eyes of future fish can be seen in these fish eggs resting in the arms of soft corals within the Browns Bank Corals MPA (© ACEP).

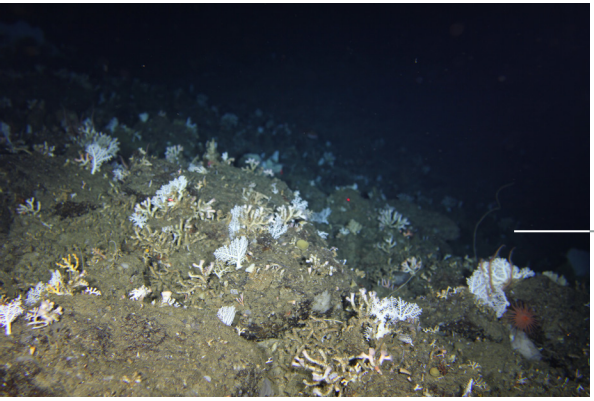
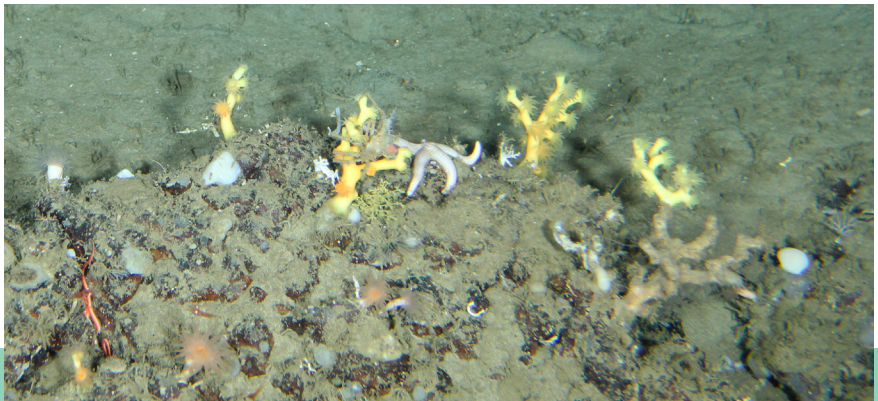


Figure 31. On the seafloor, reef building cold water corals form habitats for many species, increasing seafloor diversity. While above the surface, the MPA protects the foraging grounds of several threatened and endangered seabird species.

Figure 32. MPAs help maintain opportunities for future scientists and a PhD student is studying South Africa's deep water corals.



10. Agulhas Bank Complex MPA

'Precious Pinnacles' ± 4 300 km²

Figure 33. Our endemic South Coast rock lobsters will receive some protection in this MPA.

About 60 km south of Cape Infanta, spectacular volcanic pinnacles rise up from a depth of 80 m into a shallow bank of 14 m where *Ecklonia* kelp forests thrive. The unique forests blanketing Alphard Banks are teeming with shoals of yellowtail, geelbek, stingrays and Endangered red stumpnose, fondly known as Miss Lucy. In areas too deep for kelp, the forest transforms into fragile gardens of lace corals and sea fans. The beauty of the area attracts scuba divers while the pinnacles attract ocean wanderers like blue marlin, stingrays and turtles. South Africa's iconic seabream, the red steenbras gathers to spawn on deep reefs in this MPA and the wider Agulhas Bank is considered a nursery area for other species. This MPA supports the recovery of fisheries resources and protects fish and invertebrates found nowhere else on earth.

Protecting the largest seabream

The endemic red steenbras is the largest living seabream in the world. These Endangered fish can reach over one metre in length and an age of 55 years. The MPA protects spawning aggregations of this over-exploited fish, as well as fragile coral gardens and reefs from the impacts of trawling.

Peter Chadwick

Figure 34. Yellowtail rely on these offshore pinnacles to feed (© Steve Benjamin).

Figure 35. The MPA spans a wide depth range and incorporates diverse kelp forests with short-tailed stingrays (left, © Steve Benjamin) and fragile cold water coral gardens (right, © ACEP).

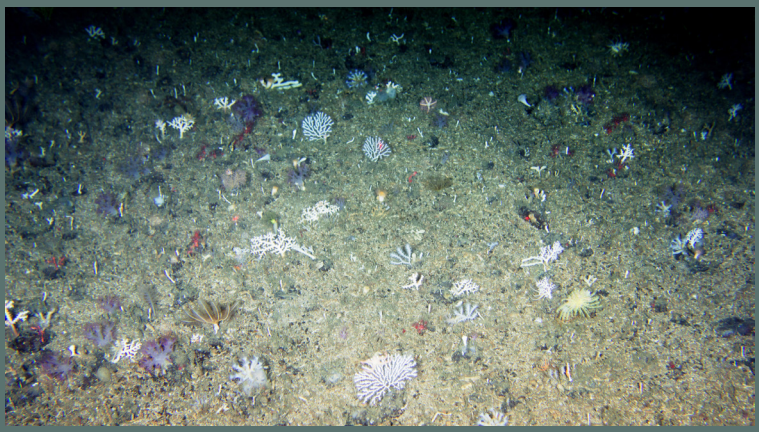
11. Agulhas Muds MPA

'Sole Food' ± 200 km²

The second smallest MPA in the network is situated offshore of Struisbaai on the south coast of South Africa. Marine mud habitats have suffered from reduced riverine flow and more than 100 years of commercial trawling. This MPA was carefully selected to avoid prime trawl and mining grounds, while protecting shallow mud habitats which are still in good condition. These mud flats provide critical refuges for sole, one of the main flatfishes targeted by the inshore trawl fishery. Recent sampling of this area revealed unidentified mud prawns (with pink stripes), many worms and other small invertebrates that provide food for fish. This MPA will be an important reference area to conduct research on mud habitats. This will help scientists understand how fish such as sole use mud habitats, information that will support eco-certification of the inshore trawl fishery and allow access to more lucrative markets.

Living Laboratories

MPAs serve as examples of what healthy ecosystems should look like. This information can be used to measure change in unprotected areas. These scientific baselines enable us to measure the impacts of climate change, invasive species or fishing, mining and other activities that take place outside the MPAs.



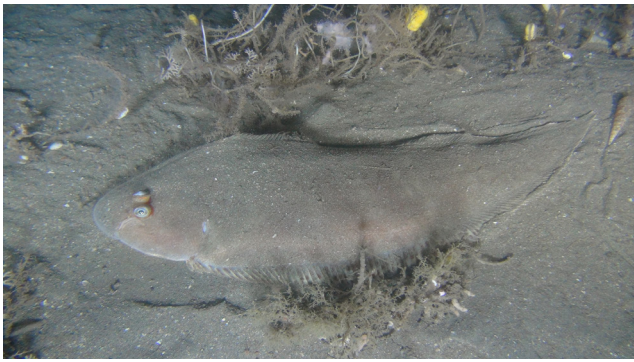


Figure 36. Gurnards (left) and soles (right, © ACEP Deep Forests project) occur on these muddy sediments of the Agulhas Muds.

12. Southwest Indian Seamount MPA

'Climate Refuge' ± 7 500 km²

This MPA is divided in two parts, and includes the only Indian Ocean Seamount in the new MPA network. The shallower part includes untrawled rocky shelf edge, with several kinds of habitat-forming cold water corals, including coral gardens at a depth of 300 m and reef-building taxa that build towers of coral standing more than 50 m off the seabed at depths of 800 to 1 200 m. These corals are sensitive to environmental changes but also form habitats for many species, increasing the diversity on the seafloor. The deeper part of the MPA protects slope and abyssal habitats in the 3 800 to 5 200 m range, making it the deepest MPA in the network. Fossilised whalebones from extinct species have been recovered from depths below 900 m and the sensitive corals in the area may hold clues to South Africa's past climate. Threatened seabirds forage here and Endangered mako sharks use the area to breed.

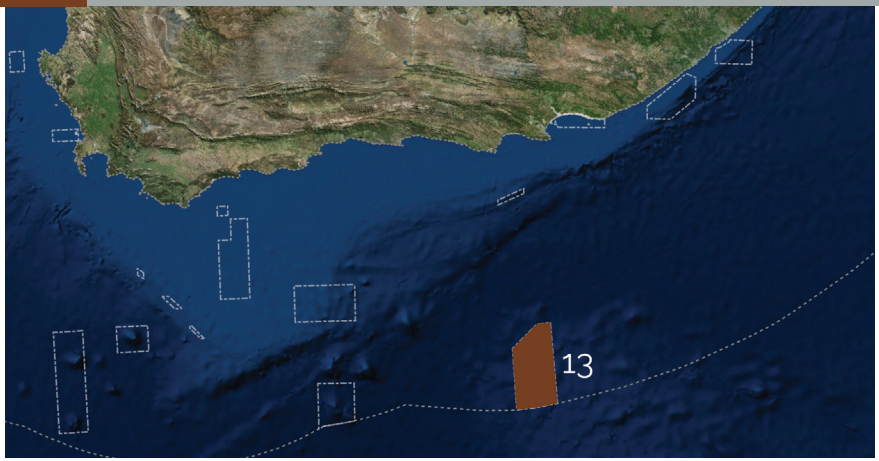
Figure 37. The South West Indian Seamount MPA includes Mako Shark nursery habitats (© Steve Benjamin).

Building climate resilience

The broad depth and temperature ranges in this MPA will enable animals to respond to changes in their physical environment as a result of climate change. This will protect habitat-forming cold water corals and the species that rely on them. The MPA will therefore help detect and provide resilience against climate change.

13. Agulhas Front MPA

'Turtle Tuckshop' ± 6 200 km²



More than 250 km offshore of Port Elizabeth is one of the deepest MPAs in the network. Abyssal habitats of the Indian Ocean, the flat deep plains of the deep sea, part of the Agulhas Plateau, a rise in the deep ocean floor, and open ocean habitats are protected in this MPA. The MPA was designed to include one of the core feeding areas of Critically Endangered leatherback turtles which feed mostly on jellyfish. Bycatch of turtles in longline and trawl fisheries is one of the main causes for population declines. The Agulhas Front MPA is critical in protecting the 'turtle tuckshop' of this iconic species, within an Ecologically and Biologically Significant Area (EBSA) recognised for its role in the life history of turtles and seabirds.

Protecting Ocean Wanderers

Protection of long-lived, far-ranging species like turtles is a conservation challenge. Offshore protected areas that cover ocean fronts, eddies and other oceanographic features can help secure feeding areas for migratory animals. Although South Africa's turtles nest in iSimangaliso, they can travel more than 5 000 km between their nesting and feeding grounds. Leatherback turtles dive more than 1 km deep!

Figure 38. This MPA is recognised as an EBSA for its role in the important life history stages of Critically Endangered leatherback turtles.

Figure 39. The MPA preserves the foraging habitat of threatened seabirds like the Black-Browed Albatross.

14. Port Elizabeth Corals MPA

'Kingklip Kingdom' ± 270 km²

Scientific research and collaboration has been integral to identifying this Ecologically and Biologically Significant Area, situated offshore of Cape St Francis, as the area was redesigned to better protect a unique seabed feature based on information from the petroleum industry and results from the Deep Secrets offshore research cruise. The area protects a deep sea ridge and coral ecosystem, providing benefits to fisheries. Kingklip, which are a valuable fisheries resource, gather to spawn in this ridge using drumming muscles to call to each other across the ocean. Deep-water coral species found in this MPA include reef-building species that make tall mounds on the slope, like giant mushroom corals (a red soft coral with enormous coral polyps) and the delicate and feathery primnoid soft corals. The MPA is situated next to a seasonal fisheries management area that protects the overexploited kingklip during their spawning time. The health of corals may rely on the protection provided by this MPA, with the aim that the complex three-dimensional structure provided by the corals may continue to provide homes and hiding places for precious seafood resources.

Protecting Fragile Corals

The MPA protects fragile corals from trawling. Corals are slow growing and may take years to recover. Untrawled habitats have significantly more biodiversity than trawled grounds in the same areas.

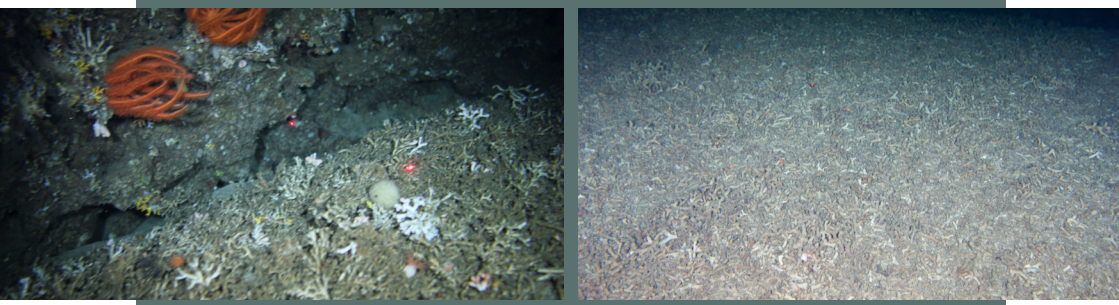


Figure 40. Untrawled (left) and trawled (right) parts of the seabed. Trawling can break down the complex three-dimensional structure that provides homes for deepsea animals.

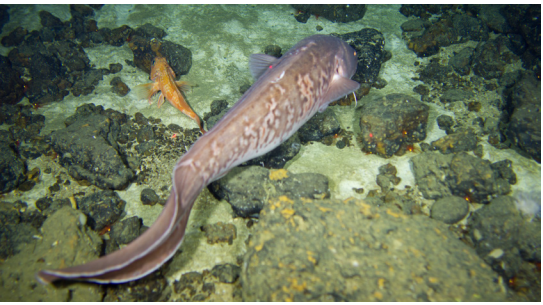


Figure 41. Kingklip aggregate to spawn here, using drumming muscles to call to each other across the ocean.

Figure 42. The ACEP Deep Secrets team used tow and drop cameras to video the seabed in seven new MPAs.

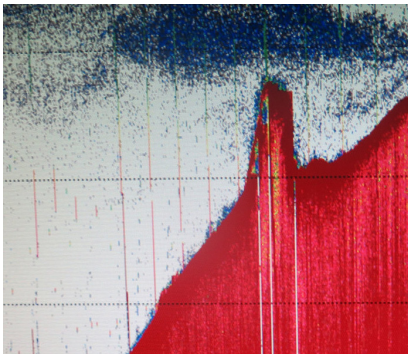


Figure 43. On this echosounder image swarms of plankton and fish above the 300 m high ridge where kingklip, a commercially important fish, aggregate to spawn. The ridge is located on the slope and rises from a depth of 700 m.

15. Addo Elephant National Park MPA

'The Big Seven' ± 1 100 km²

The Addo Elephant Park is renowned for protecting the 'big five' and with the expansion of the park into the ocean this extends to the 'big seven', also protecting great white sharks and whales. Close encounters with dolphins, white sharks, orcas and four species of whale (brydes, minke, humpback and right whales) provide significant ecotourism opportunities and this MPA in a growing Metro provides outdoor classrooms for the next generation. Algoa Bay has the highest percentage of endemic (not found outside of South Africa) marine invertebrates and seaweeds along the entire South African coastline, making it an excellent place to conserve biodiversity. The offshore expansion will increase island protection, provide protection to a beautiful bay that is under increasing pressure, and help protect an interconnected system of estuary, shore, bay, reefs and islands that is important for the recovery of resources like abalone and kob. The MPA affords protection to the largest breeding colonies of Endangered African Penguins and Cape Gannets on earth. St Croix and Bird Island holds approximately 9 000 breeding pairs of African Penguins and Bird Island has approximately 60 000 pairs of Cape Gannets.

Medicines from the deep

This MPA provides untapped possibilities for **bio-discovery** and the **bio-economy**. Marine species may produce powerful medicines and other compounds and services that are yet to be discovered. The endemic **frilled nudibranch** is found in this region, a sea slug that produces an **effective compound against Oesophageal cancer**.

Figure 44. The proclamation of the MPA will upgrade the 'big five' already protected by the park to the 'big seven', with the protection of Great White Sharks and Southern Right Whales (© Peter Chadwick).

Figure 45. The worlds largest Cape Gannet (*Morus capensis*) Colony breed on two offshore islands in Algoa Bay, St Croix and Bird Island (© Peter Chadwick).

16. Amathole Offshore MPA

'Lace Coral Gardens' ± 4 200 km²

Multidisciplinary research confirmed the importance of these two areas, which extended the existing coastal MPAs on either side of East London offshore. The MPA extension provides the first protection for several unprotected ecosystem types which are trawled elsewhere in the Agulhas Ecoregion. Unique habitats in good condition will be protected including a spectacular canyon, just offshore of the site where the first coelacanth known to science was caught. The MPA also protects fragile lace coral gardens, which are only known from this area of shelf edge and canyon margin. These corals provide refuge to endemic South Coast rock lobster, a valuable resource species. The northern part of the MPA protects the river fan of the magnificent Kei River and is home to sponges and soft corals. Endangered red steenbras, the world's largest seabream, need refuge in this MPA to boost the recovery of their populations, which have become threatened due to overfishing.

Lace Corals-Underwater Fynbos

The Cape Region is renowned for its attractive natural vegetation, fynbos. Lace corals have been described to be underwater fynbos as they are only found in a small region and are famous for their beauty. Also like fynbos, they allow a great diversity of organisms to live on and around them.

Figure 46. The first coelacanth known to science was caught in the Gxulu section of this MPA (© Peter Timm).

Figure 47. Whip and spiral wire corals are found on the deep reefs (© ACEP Imida Project).

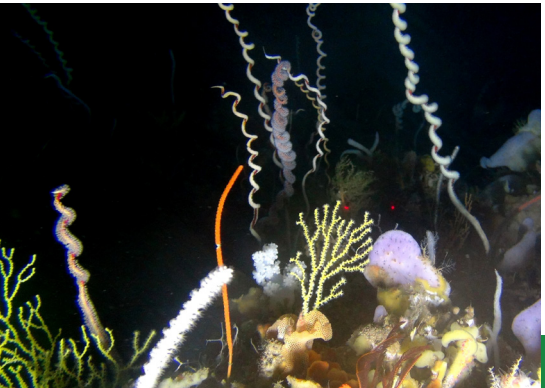
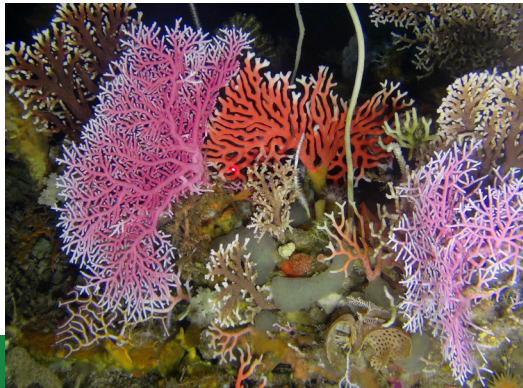


Figure 48. Fragile lace corals decorate the seafloor of this MPA (© ACEP Imida Project).



17. Protea Banks MPA

'Shark Park' ± 1 200 km²

This MPA is offshore of the existing Trafalgar MPA in southern KwaZulu-Natal, which protects rocky shores with diverse seaweed gardens, beach fossils and nutrient-rich reefs. The offshore area between the Mzimkhulu and Mpenjati Estuaries includes three submarine canyons, the world famous shark diving destination of Protea Banks, and sponge and coral habitats. The MPA is zoned to allow line fishing in some areas but sharks receive full protection. In Zulu, *vungu* refers to the sound of a waterfall or wind in a gorge, which describes the strong nature of deep sea currents gushing through the Vungu, Margate and Mzimkhulu Canyons. These currents carry food to a diversity of filter feeders such as stony, lace and soft corals, sea fans, sponges and benthic comb jellies. Several recorded species are unknown to science, which provides opportunities for young scientists to describe and discover new species and their benefits. The annual sardine run is a drawcard for local and international tourists, which provides economic opportunities for locals. The MPA aims to support new initiatives to help support a thriving tourism economy on the Hibiscus Coast.

Shark Sanctuary

This large MPA is renowned for its shark aggregations and at least seven species of shark are regularly seen in this area. Divers are drawn to the area by huge schools of hammerheads, large groups of raggedtooth sharks and the only known aggregations of giant guitar sharks in the world. All sharks are fully protected in this MPA to maintain this valuable tourism asset.

Figure 49. Raggedtooth sharks are one of 7 species that divers come to see (© Geoff Spiby).

Figure 50. Protea Banks is a world famous shark diving site (© Geoff Spiby).

18. Aliwal Shoal MPA

'Spawning Seabreams' ± 670 km²

The existing MPA south of Durban was expanded inshore and offshore, improving protection to the KwaZulu-Natal south coast. It extends between the Illovo and Mzimayi Estuaries and includes the iconic Greenpoint, the popular shore fishing area of Mamba Alley (zoned to accommodate shore fishing) and the Clansthal area. Key deep reefs and the historic spawning grounds of overexploited seabreams such as South Africa's seventy-four. Seventy-four was once the most common table fish in KZN but stocks have since collapsed and it is now a specially protected species. By protecting the area where fish gather to spawn, there is hope that seventy-four populations will re-establish and stocks will recover. This MPA also protects other overexploited fisheries resources like geelbek and dusky kob. The Crown Area is popular with divers that are attracted by aggregations of raggedtooth, tiger and blacktip sharks. The expanded MPA protects this main area of the Aliwal Shoal Reef but adds protection to deeper water ecosystems and species such as catsharks, deep-water corals and the mysteries of the upper slope that scientists are just starting to explore (down to 2 200 m). The expansion of Aliwal Shoal will increase tourism development as it links to Blue Flag beaches, scuba operations and educational sites to amplify social benefits.

Figure 51. The Aliwal Shoal expansion is important for growing the ecotourism sector. Each year, thousands of divers are attracted to the coral reefs, wrecks and shark aggregations (© Geoff Spiby).

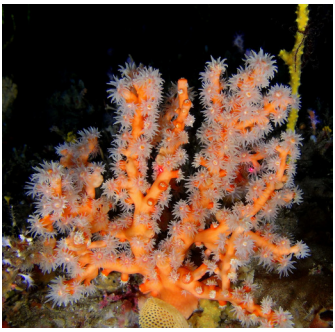
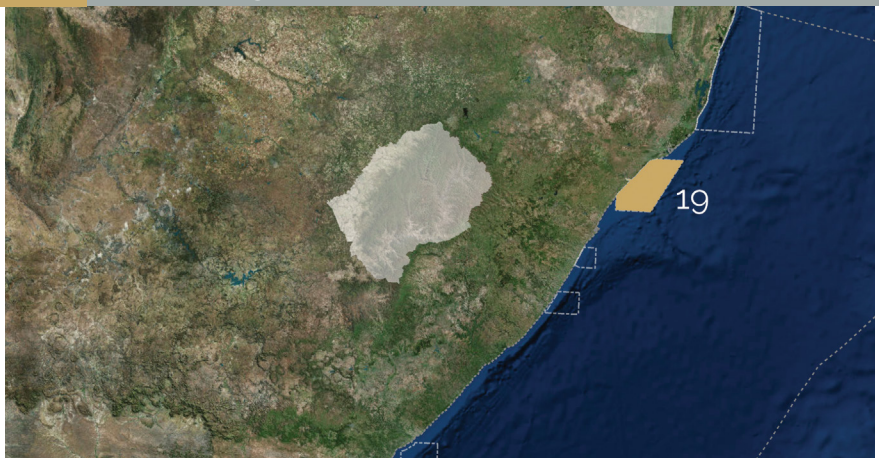


Figure 52. The reefs and wrecks of Aliwal Shoal host diverse species including Dendrophylliid corals (left) and Yellow-mouthed Moray eels (right, © Geoff Spiby).

Figure 53. The polyps of a hydroid and an anemone in Aliwal Shoal (© Geoff Spiby).

19. uThukela Banks MPA

'Startling Surprises' ± 4 100 km²



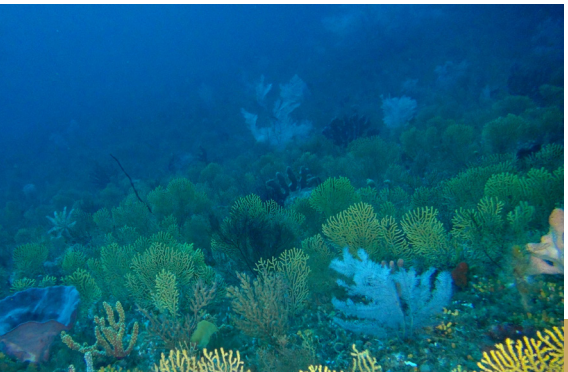
The beauty of this Critical Biodiversity Area amazed and surprised scientists exploring it using Remotely Operated Vehicles (ROV), and hence the name uThukela, meaning 'something that startles'. The MPA protects key ecosystems and processes linked to the essential role of freshwater input from the uThukela river, including the supply of nutrients and sediments. As such, rich muddy habitats and fish such as kobs were not unexpected, but the spectacular pinnacles and large seabreams observed during surveys were not anticipated. Large seabreams, including the seventy-four, take refuge on the deep reefs, coexisting with large adult black musselcrackers (fondly known as poenskop), yellowbelly rock cods and catface rock cods. Seahorses have been seen in this MPA while in the deeper muds, fields of sea pens (soft corals adapted to living

Figure 54. The uThukela Banks support South Africa's prawn trawl fishery.

Figure 55. Large seabreams such as this black musselcracker (poenskop) will be protected in this MPA (© ACEP Spatial solutions).

on soft sediment) occur alongside thistle corals, an amazing variety of living seashells and many species of crabs, prawns, starfish and urchins. The deep reefs are home to sea fans under investigation for their antibacterial properties. Tall rocky pinnacles are crowned with dense carpets of sea fans and giant slow-growing black coral trees. These long-lived species make excellent indicators to help monitor the state of our oceans. This MPA protects nursery and spawning grounds allowing the recovery of commercially important fish and crustacean species. uThukela Banks MPA affords protection to baby hammerhead sharks and the nursery areas of other species that rely on the rich, turbid muddy water for feeding and hiding from predators.

Figure 56. The MPA preserves beautiful coral gardens and unique deep muddy and gravel habitats (© ACEP Spatial Solutions Project).



20. iSimangaliso MPA

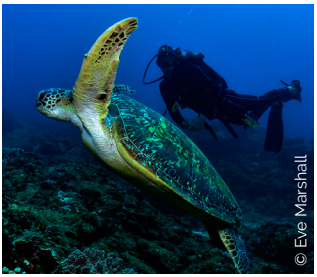
'Miracles and Wonder' ± 10 700 km²

This MPA on the north coast of KwaZulu-Natal expands and consolidates the original St Lucia and Maputaland Marine Reserves by between 22 and 83 km offshore, and also extends the southern boundary of this World Heritage Site. *iSimangaliso*, the Zulu word for 'miracle and wonder', describes the pristine and intricate connected ecosystems of this Wetland Park that protects estuaries, a coastal lake, coral reefs, deep reefs, canyons and the open ocean. The expansion increases eco-tourism opportunities by providing increased protection for many wildlife species that scuba divers come to see: turtles, whale sharks, manta rays, marlin, sailfish, raggedtooth sharks, reef sharks and even coelacanths. This MPA will protect the entire deep canyon systems where ancient coelacanths rest and feed, while also protecting dense deep forests of sea pens (soft corals adapted to living in sand) and giant sponges. The spectacular coral and deep reefs are home to more than 1 000 recorded fish species and may be critical refuges as climate change has yet to seriously impact South Africa's coral communities.

Dinosaur Fish

iSimangaliso is home to the most accessible population of coelacanths on the planet. Thought to be extinct for millions of years, these fish shared the earth with dinosaurs. The offshore expansion will protect the entire canyons and offshore range of iSimangaliso's thirty three known individual coelacanths, each recognised by their unique spot patterns.

Figure 57. Expansion of MPAs at iSimangaliso enables better protection of deep reefs, entire submarine canyons and open ocean wanderers like whale sharks, manta rays and turtles.



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SANBI

The Marine team of the South African National Biodiversity Institute (SANBI), as an entity of the Department of Environmental Affairs, has provided science based advice and contributes to South Africa's Marine Biodiversity sector. The team, led by Dr Kerry Sink, played a central role in co-ordinating research to identify sites for MPA expansion by forming relationships with academic institutions, government and industry.

CMR and NMU

The Institute for Coastal and Marine Research (CMR) has a long history of coastal and marine research and engagement at the Nelson Mandela University (NMU). It comprises a multi-disciplinary collection of staff and postgraduate students across six faculties within the University, including research associates, and local and international collaborators. The institute aims to build capacity and provide cross cutting research to advance our understanding of the coastal and marine environment.

ORI and SAAMBR

The Oceanographic Research Institute (ORI) is the research division of the South African Association for Marine Biological Research (SAAMBR), a non-government, non-profit company with a long history of involvement in research leading to the proclamation and selection of MPAs including iSimangaliso, uThukela Banks, Aliwal Shoal and Protea Banks MPAs. Staff members have taken part in ACEP Surrogacy and Spatial Solutions Projects and led the ACEP uThukela Bight Project providing foundational science on the functioning of the KwaZulu-Natal Bight. SAAMBR has also provided marine social science and substantial science communication support.


© Peter Chadwick

In 2019 the South African Minister of Environmental Affairs approved the declaration of 20 new Marine Protected Areas (MPAs). This proclamation was the culmination of over 12 years of research by scientists from DEA, SANBI and a network of research institutions. The research identified areas of ecological and biodiversity importance in the South African EEZ. Through careful Marine Spatial Planning, ocean industries such as fishing, mining and shipping can co-exist with marine protected areas, and in the case of fisheries, even benefit. The government's initiative of *Operation Phakisa*, meaning 'hurry up', fast-tracked the implementation of the planning of these MPAs. In this book each of the new MPAs will be introduced, highlighting their special features and why they are important.

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ISBN 978-1-928224-31-0

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