INCORPORATING

Helping people to care for our ocean

Marine Careers

So, you want to work with the sea?

Did you know?

- Over 70% of the Earth's surface is ocean.
- Life on Earth is possible because of the oceans.
- We know more about the surface of the moon than we do about the deepest parts of our oceans.
- Most oxygen used on land is generated in the world's oceans.
- The Earth's climate is driven by the oceans.
- 60% of South Africans live within 100 kilometres of the sea.
- The sea provides over one billion people with their primary source of protein.
- 85% of the world's fisheries are fully or over exploited.
- Over 450 cubic kilometres of waste is dumped into the sea each year.
- Widespread marine habitat destruction has left many coastal communities vulnerable.

Why choose a marine career?

Over half of the world's population lives in countries edging on the Indian Ocean. Most of these are developing countries that have a critical need for food security, development opportunities and sustainable use of their resources.

As a growing global population stresses the ability of our society to produce food, water, shelter and energy, we will continue to look to the oceans to help sustain our basic needs.

To survive, we will have to build upon our existing knowledge of the ocean and its potential to help meet the needs of the world and its inhabitants. We urgently have to manage our interactions with this environment.

From scientists to technicians and laboratory assistants... from divers to marine mammal trainers... from resource managers to environmental educators... many different and exciting opportunities are available to those who want to pursue a career in the marine environment.

This booklet, developed and produced by SAAMBRs' uShaka Sea World Education Centre based at uShaka Marine World, is an introduction to marine careers. Information includes: different career options and areas of specialisation; tertiary qualification requirements; working conditions; and potential employment prospects.

Learners are encouraged to research further, to make contact with institutions and organisations working in the marine environment, and to explore options for tertiary education and training.

Most importantly, we encourage learners to discuss Grade 10 subject choices with their educators.

Aquarist

looks after fish and other animals in the aquarium and ensures animals on exhibit are healthy and well fed. Also provides enrichment for the animals to ensure good animal welfare.

Where to begin:

- BSc with Zoology

Coastal engineer

uses engineering techniques in the coastal zone and offshore environment. Coastal and ocean engineering is a branch of civil engineering and involves the development of harbours, recreational facilities, effluent outfalls and mining.

Where to begin:

- BSc Eng specialising in Civil Engineering

Commercial diver

uses SCUBA equipment to do a wide range of different jobs under water. Commercial divers help to build piers or pipelines, or they can help to salvage (recover) the wrecks of ships that have sunk at sea.

Where to begin:

- Class 4 commercial dive qualification (available at a Professional Dive Centre)

Fisheries economist

is concerned with the question of how people's material needs can be satisfied by the marine environment with the aid of such resources as labour, capital, technology and entrepreneurship.

Where to begin:

- BCom with specialisation or
- BEcon with specialisation

Fisheries officer

ensures the public are aware of and adhere to regulations associated with the harvesting of marine species and marine protected areas.

Where to begin:

- National Diploma in Fisheries Resource Management (available at CPUT) or
- BSc

Marine careers are very specialised and it is important to understand that to succeed, you must be prepared to spend a great deal of time and effort acquiring the necessary education and training.

The first, and probably most important thing to consider is your choice of Grade 10 subjects. Subject choices directly influence what career opportunities will be available to you in the future. Your subject choices should match requirements for the specific tertiary training and education you will need to complete to pursue a particular marine career.

This booklet offers you an introduction to what tertiary qualifications are necessary for specific marine careers, as well as suggestions on what and where to study. We encourage you to do further research and to contact the many institutions and organisations mentioned for specific information on entry requirements, syllabus and length of study.

Remember... entrance into tertiary education institutions is by no means guaranteed, and you will be facing tough competition. Tertiary education is expensive and bursaries are only offered to students who have good matric marks.

Fisheries scientist

studies the numbers of different types of fish and other marine animals that are harvested by people. Fisheries scientists work out how marine resources can be harvested sustainably.

Where to begin:

- BSc followed by
- BSc (Hons) in Ichthyology/ Fisheries Science followed by
- MSc in Icthyology/ Fisheries Science

Mariculturalist

farms marine species under controlled or natural conditions.

Where to begin:

- BSc followed by
- BSc (Hons) followed by
- MSc with specialisation

Marine behaviourist

specialists who care for, train, and do educational presentations with dolphins, seals and other marine mammals and birds.

Where to begin:

- BSc or
- National Diploma in Nature Conservation or
- BA/BSocSci (Social Science) with Psychology major or
- BA with Drama major

Marine biologist

studies the animals and plants that live in the sea. Marine biologists study the distribution, abundance and life cycles of organisms and may also study the biological interactions between different species and their environment.

Where to begin:

- BSc followed by
- BSc (Hons) followed by
- MSc with specialisation

Marine chemist

investigates the processes determining the distribution and effect of chemicals, pollutants and micro-nutrients on the marine environment. They also search for natural products from the sea for food production, cure of diseases and industrial applications.

Where to begin:

- BSc with Chemistry

What and where to study

A Bachelor of Science degree is a good place to start and is three years in duration. An Honours degree is a further year of study. In addition to majoring in one or two of Botany, Zoology, Chemistry, Geology, Physics, Microbiology, Environmental or Cell Biology, the prospective marine scientist may include a course in Mathematics, Statistics and/or Computer Science in the degree. A carefully considered combination of minor subjects is also of vital importance.

A degree in Engineering provides an excellent basis for specialisation in certain aspects of physical oceanography. Certain South African universities teach subjects with a marine science content at the honours level, while a number of universities provide post-graduate training in aspects of marine science. Different universities offer different courses and it is important to ensure that the university you select offers the courses that interest you. Be sure to check entry requirements as these could differ from university to university.

Marine educator

creates an awareness of the importance of the marine environment and inspires people, both young and old, to live in harmony with our environment.

Where to begin:

- BSc plus Post Grad Certificate in Education or
- BEd with Science/ Life Science

Marine geoscientist

researches the processes forming the sea floor as well as the sediments and rocks at the bottom of the ocean and along the shoreline.

Where to begin:

- BSc with Geology and Geography
- followed by
- BSc (Hons) followed by
- MSc with specialisation

Marine surveyor

makes maps of the ocean floor. These maps show all of the features under the sea (just as a map of the land would), and help people to find their way around the oceans.

Where to begin:

- BSc with Geology and a course in marine surveying
- The Navy provides training for various careers including marine surveyor

Marine veterinarian

cares for and performs procedures on marine animals to ensure their health and well-being.

Where to begin:

- BVeterinary science or
- BVeterinary nurse at Onderstepoort University of Pretoria
- Complete practical and in-service training

Maritime lawyer

Maritime lawyer works with and helps others to understand the laws that govern international maritime zones and marine resources.

Where to begin:

- BA LLB followed by
- Post Graduate Diploma in Maritime Law (available at UKZN and UCT)

Technical training

For those who do not want to become scientists, there are several marine careers to consider. Laboratory technicians, draughtsman, electronics technicians and instrument makers are required on ships and in laboratories, for example. Cape Peninsular University of Technology offers a National Diploma in Oceanography which concentrates on technical training in the marine field. This is a three-year course, half of which is spent at a research establishment. A skipper's or advanced diving qualification may also be required. For those interested in working in the field of marine conservation, the Nature Conservation Diploma offered at Technikon SA, Tshwane University of Technology, Mangosuthu University of Technology and Cape Peninsular University of Technology provides a good background.

Oceanographer

studies the ocean. There are many different types of oceanographers. For example, a physical oceanographer studies the physical properties of seawater and the forces that move it.

Where to begin:

- BSc or
- National Diploma in Oceanography (available at UCT) followed by
- BTech Oceanography followed by
- MTech Oceanography

Technician

oceanographic technicians perform vital applied functions in many oceanographic fields. They may focus on collecting specimens in the field, working in laboratories, or on making and maintaining equipment.

Where to begin:

- National Diploma in Oceanography (available at CPUT) or
- other technical qulaification

South African Navy

offers a choice of careers from officers' posts such as combat officers and intelligence officers, to posts like surveying, navigation, catering or diving.

Where to begin:

- The Navy provides training . Visit their website www.navy.mil.za

Environmental Health

the use of the sea for sewage and industrial effluent is increasing. It is essential to have people monitoring water quality to determine the impact on the surrounding environment.

Where to begin:

- National Diploma in Environmental Health followed by
- BTech Environmental Health

University entry requirements

Most BSc degrees require a minimum Admission Point Score (APS) of 34-40 points with:
Maths (4/5)
English (4/5)
Life Orientation (4/5)
Biological/Physical Science (4)

National Senior Certificate (NSC)	NSC %	Admission Point Score (APS)	APS%
		8	90-100%
7	80%-100%	7	80-100%
6	70%-79%	6	70-79%
5	60%-69%	5	60-69%
4	50%-59%	4	50-59%
3	40%-49%	3	40-49%
2	30%-39%	2	30-39%
1	0-29%	1	0-29%

Places to study

Area	Institution	Degree or Programme
Durban	Durban University of Technology Mangosuthu University of Technology University of KwaZulu Natal	NDip Engineering NDip Engineering BSc (Biology or Agriculture) and BSc in Marine Biology
Cape Town	Cape Peninsula University of Technology University of Cape Town University of the Western Cape	NDip Oceanography; NDip Environmental Heath Management BSc Oceanography and Marine Biology; BSc Engineering BSc Environmental Science; Conservation; Geology
Stellenbosch	Stellenbosch University	BSc; BEngineering
Grahamstown	Rhodes University	BSc in Ichthyology and Fisheries Science or Environmental Science or Zoology
Port Elizabeth	Nelson Mandela Metropolitan University	NDip Engineering; BSc Economics; NDip Game Ranch Management; BSc
Pretoria	University of Pretoria Tshwane University of Technology	BSc; BEngineering NDip Nature Conservation; NDip Ecotourism
Distance Learning	University of South Africa	BSc; NDip Nature Conservation

Working conditions and employment possibilities

In the marine environment, working conditions vary in relation to the nature of the work being done. Researchers can expect to spend time out in the field, be it at sea, on the beach, or in an estuary. However, not all researchers' time is spent in the field – for every hour spent in the field, there are many more spent in the lab analysing data and writing reports or papers. If your job is more technical, you will spend time in a lab, while educators will spend most of their time working with people, especially children.

Whilst rewarding and often exciting, a marine career should only be considered by dedicated and committed individuals. Salaries are low in comparison to many other professionals even though the work is demanding, specialised and vital to ensure the sustainable future of our marine resources. A marine career is chosen for the love of the job and the environment.

Useful contacts, employment prospects and places of work

Bayworld
PO Box 13147, Humewood
6013 Tel:
041 584 0650
www.bayworld.co.za

Cape Peninsular University of Technology (CPUT)
PO Box 1906, Bellville 7535
Tel: 021 959 6767
www.cput.ac.za

Department of Ichthyology Rhodes University (RU)
PO Box 94, Grahamstown
6140
Tel: 046 603 8111
www.ru.ac.za

Ezemvelo KZN Wildlife
P/Bag X3, Congella 4013
Tel: 031 274 1150
www.kznwildlife.com

Institute of Oceanography University of Cape Town
(UCT)
P/Bag Rondebosch 7701
Tel: 021 650 2712
www.sea.uct.ac.za

Irvin & Johnson Limited
295 Florida Road,
Durban 4001
Tel: 031 313 8400
www.ij.co.za

Lusitania Food Products
PO Box 17391,
Dalebridge 4014
Tel: 031 466 1545
www.lusitania.co.za

Department of Agriculture, Forestry and Fisheries
22 Margaret Mncadi Avenue,
Durban 4001
Tel: 031 337 2755
www.daff.gov.za

Murray & Roberts Construction
(Land and Marine)
PO Box 1000,
Bedfordview 2008
Tel: 011 456 6200
www.constructionmurrob.com

KwaZulu-Natal Sharks Board
P/Bag 2,
Umhlanga Rocks 4320
Tel: 031 566 0400
www.shark.co.za

National Resources and the Environment CSIR
PO Box 395, Pretoria 0001
Tel: 012 841 3256
www.csir.co.za

Nelson Mandela Metropolitan University
PO Box 77000,
Port Elizabeth 6031
Tel: 041 504 3364
www.nmmu.ac.za

School of Geosciences Wits University
P/Bag 3,
Witwatersrand 2050
Tel: 011 717 1000
www.wits.ac.za/geosciences

South African Navy
SA Naval Headquarters
P/Bag X104, Pretoria 0001
www.navy.mil.za

Sea Harvest
PO Box 761,
Cape Town 8000
Tel: 021 468 7900
www.seaharvest.co.za

South African Institute for Aquatic Biodiversity
P/Bag 1015,
Grahamstown 6140
Tel: 046 603 5800
www.saiab.ac.za

South African Naval Hydrographic Office
P/Bag X1, Tokai 7966
Tel: 021 787 2408
www.sanho.co.za

The South African Museum
PO Box 61, Cape Town 8000
Tel: 021 481 3800
www.iziko.org.za

Two Oceans Aquarium
PO Box50603,
Cape Town 8002
Tel: 021 418 3823
www.aquarium.co.za

University of KwaZulu-Natal (UKZN): Durban
King George V Avenue
Durban 4001
Tel: 031 260 1111
www.ukzn.ac.za

University of KwaZulu-Natal (UKZN): Pietermaritzburg
King Edward Avenue
Scottsville 3201
Tel: 033 260 5111
www.ukzn.ac.za

The South African Association for Marine Biological Research (SAAMBR)

- **The Oceanographic Research Institute (ORI)**
- **uShaka Sea World Education Centre**
- **uShaka Sea World**

PO Box 10712,
Marine Parade 4056
Tel: 031 328 8222
www.seaworld.org.za

Marine Careers Programmes

Grade 9 to 12 learners

We have various programmes at uShaka Sea World that expose learners to a range of marine careers within our facility.

For more information please contact:
uShaka Sea World
Education Centre
Tel: 031 3288195/6
Fax: 031 3288211
education@seaworld.org.za