

Nelson Mandela University Ocean Science Campus

Opportunities for Post-Graduate Studies in Marine Science 2018

NELSON MANDELA
UNIVERSITY



In association with



National
Oceanography Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL



RESEARCH
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GCRF
Global Challenges Research Fund

Opportunities to study ocean science are now available starting in February 2018 at the newly opened *Ocean Science Campus* (OSC) located at the Nelson Mandela University in Port Elizabeth, South Africa. Phase 1 of the OSC was completed in September 2017 (above pics). The regional facility embraces state-of-the-art physical oceanography work spaces, laboratories, post graduate offices, board and lecture rooms, experimental aquaria and a scientific diving and training centre — all of which support a range of disciplines including ocean physics, biogeochemistry, phytoplankton, zooplankton, trophic assemblages and ecology, and fisheries across estuaries, coastal, shelf and deep ocean waters. The OSC is a post graduate facility specialising in the impacts of climate change on western Indian Ocean (WIO) marine ecosystems. It is strongly allied with the *International Indian Ocean Expedition 2 (IIOE2)* (<http://www.iioe-2.incois.gov.in/>) initiative and the Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER — <http://www.incois.gov.in/portal/siber/index.jsp>). As the OSC is focused on regional research, post graduate students studying for MSc and PhD degrees and Post-Doctoral candidates are placed in international, multidisciplinary teams which explore and model the varying ecosystems of the WIO. This not only broadens their knowledge base in ocean science and linkages but also prepares early career scientists for the working environment where teamwork is essential to study large, complex earth systems. Ship-based and robotic sampling forms a key component of all research projects. Research and outputs are strongly aligned with food security and science to governance.



This advert for two study positions initiates the South African part of a new, largescale, 4-year international project (2018-21) which investigates ecosystem functioning in the domains of the East African Coastal Current (Kenya and Tanzania) and the Agulhas Bank (South Africa), with reference to climate change and food security. Referred to as SOLSTICE-WIO (*Sustainable Oceans, Livelihoods and food Security Through Increased Capacity in Ecosystem research in the*

Western Indian Ocean — <http://solstice-wio.org/>), the project aims to also build research capability in the WIO and hence student training and early career advancement is of great importance. Funding for SOLSTICE is provided by the UK Global Challenge Research Fund (GCRF) with scientific expertise from the National Oceanography Centre (Southampton) and the Lyell Centre - Heriot-Watt University (Edinburgh).

The chosen Post Graduate students will be based at the OSC but will also be required to travel to the National Oceanography Centre (NOC) and/or Heriot-Watt University (UK) for training and co-supervision during their study period, and therefore must meet UK visa criteria. These visits will provide exposure to international standards for research. They will be part of a transdisciplinary team based between these institutes and will need to work as part of the SOLSTICE team. Students must be highly motivated and determined to succeed as the SOLSTICE team will depend on their results which will be published in peer-reviewed international journals. Scholarships from the Nelson Mandela University will be provided for the duration of study (3 years maximum).

Closing date for applications: 3 April 2018

SOLSTICE Projects and positions

The South African component of SOLSTICE, led by the Nelson Mandela University, is focused on the collapse of the squid fishery in 2013-14, and the underlying ecosystem shifts that might have been responsible. The study encompasses physical and biological oceanography (incl. biogeochemistry) as well as socio-economic aspects of the collapse of squid fishery.

Two PhD positions are still available as of April 2018:

Composition, dynamics and role of Benthic Nepheloid Layers (BNLs) on the Agulhas Bank: This project aims to understand the formation and decay of the BNL on the eastern Agulhas Bank. The BNL is responsible for water clarity near the seabed which appears to play an important role in squid spawning behaviour. Suspended organic bottom particles also support bottom filter-feeders and nutrient regeneration making them key components of the ecosystem. The project will involve going to sea on large and small vessels to collect water samples containing marine snow using a “snow catcher” and analysing these for particulate organic matter (POM) composition and settling rates. Experimentation both in situ and in the laboratory will also be undertaken to determine microbial decomposition rates and products. This work will be undertaken in tandem with another PhD study that uses moorings to measure and monitor the occurrence and intensity of BNLs. Expected level of study will be a PhD with the student have strong skills in microbiology or marine biology, statistical analyses and communications (good English, written and spoken). Candidates with previous experience in experimental set-up and biological oceanography will be an advantage.

Short title: Marine snow Agulhas Bank

Start date: February 2018

[For official purposes: Student # 3]

Composition, dynamics and productivity of phytoplankton on the eastern and central Agulhas Bank:

This project will examine how the community composition and productivity of phytoplankton communities on the Agulhas Bank varies from east to west, using new ship-collected samples and experiments. Central to the project is to gain an understanding of how nutrient ratios (e.g. nitrate to silicate) in fresh and aged upwelled water influence diatom or non-diatom dominance of biomass

(carbon, chlorophyll), primary productivity and ecosystem dynamics. Fresh upwelled water over the central Agulhas Bank may be diluted with aged (silicate-depleted) water upwelled to the east, leading to high ratios of nitrate to silicate, which in turn favour the growth of non-diatom communities such as dinoflagellates and small flagellates. Whilst diatoms support short, productive food chains, dinoflagellates and small flagellates interact more with small and intermediate sized zooplankton and lead to longer, less productive food chains. Hence, the characteristics of localised upwelling leads to selection and dominance of different phytoplankton communities and diverse marine ecosystems. The student will be expected to participate in sample collection and analysis at sea, as well as the enumeration of phytoplankton in preserved water samples in the laboratory. Training in phytoplankton identification, enumeration and community analysis, as well as measurements of chlorophyll concentration, phytoplankton biomass and primary production (using the stable isotope carbon-13) will be provided.

Short title: Phytoplankton Agulhas Bank

Start date: March 2018

[For official purposes: Student # 6b]

Enquires and Applications

Interested students should electronically submit:

1. CV with university courses and grades
2. A letter of motivation of why you want to do the project
3. Copy of ID/passport

These should be sent to:

Dr Margaux Noyon

Ocean Science Campus

Nelson Mandela University

Email: Margaux.Noyon@mandela.ac.za