



## SOLSTICE lays the foundation for marine robotics in the Western Indian Ocean

The GCRF-funded SOLSTICE project has initiated a Centre for Autonomous Marine Operations and Systems (AMOS) at the Nelson Mandela University's (NMU) brand new Ocean Science Campus.

Understanding the impact of climate change on marine ecosystems is pivotal to addressing societal challenges in the Western Indian Ocean (WIO) region - most notably food security and poverty. SOLSTICE uses powerful state-of-the-art technologies to probe the functioning of WIO ecosystems and their future states: modelling, remote sensing, and marine robotics.

While ocean models are capable of providing scenarios for the future, they also need to be ground-truthed using observations from in-situ measurements. However data collected by ships are costly to acquire. Few developing countries have the resources to own and operate research vessels.

Marine robotics offer a real solution to in-situ data collection as they are relatively inexpensive compared to ships and easy to deploy. SOLSTICE aims to demonstrate some of the key marine robotic technologies in the Tanzania and South African Case Studies.

Owing to strong local logistical support, the new Ocean Science Campus at NMU has been chosen as the hub for marine robotics in the UK-SA-WIO wide research network presently being established by SOLSTICE.



NMU engineers being briefed at the NOC MARS-NMF facility on the latest robotics technologies

The WIO-AMOS Centre operating under NMU Faculty of Engineering will perform two functions. It will support WIO-wide research through the deployment and operation of off-the-shelf robotics such as gliders. The Centre will host and maintain the robotics equipment with dedicated engineers who will also execute data collection missions. The other function will be to stimulate innovation in marine robotics, i.e. design and build new robots to support the ocean sciences, in collaboration with the National Oceanography Centre, UK. The Centre will have a strong training component involving postgraduate students from both institutions and the wider WIO.

In preparation for WIO-AMOS, The Dean of Engineering, Prof Ossie Franks, accompanied by two NMU engineers and postgraduate students visited the NOC MARS facility in May 2018 to learn of the latest developments (pictured left). On their return, NMU was awarded \$850,000 over three years by the merSETA<sup>1</sup> to initiate the new facility. Core funding from the South African Government to purchase a small fleet of robots is now being pursued. Full growth of WIO-AMOS will be facilitated by a 5-year appointment of the Chair in Marine Robotics.

1. merSETA, is a Public Entity incorporated in terms of the Skills Development Act (Act 97 of 1998), responsible to facilitate Skills Development in the Manufacturing and Engineering Sectors in South Africa



The Global Challenges Research Fund (GCRF) is a £1.5 billion fund, which supports cutting-edge research and innovation that addresses the global issues faced by developing countries. SOLSTICE is part of the Research Councils' GCRF Growing Research Capability call launched in 2016. The call was developed to grow research capacity around the globe and to strengthen and broaden skills and expertise to address specific challenges of developing regions and countries.



## About the SOLSTICE Project

Poor coastal communities are at the frontier for climate change impacts, compounded by population growth and food demand, but are among the least resilient to the challenges of the future.

SOLSTICE is a four year collaborative Global Challenges Research Fund project that brings together recent advances in marine technologies, local knowledge and research expertise to address challenges facing the Western Indian Ocean region in a cost-effective way via state-of-the-art technology transfer, collaborative environmental and socio-economic research and hands-on training.



The project outcome described in this Success Story contributes to the following objectives of the GCRF program “Growing research capability to meet the challenges faced by developing countries.”

Objective	Contribution
Strengthening capacity of individuals, organisations and institutions of DAC-listed countries to effectively carry out and disseminate high quality research	HIGH
Strengthening capacity of UK organisations to undertake interdisciplinary research in ODA context	HIGH
Strengthening capacity of UK organisations to apply leading-edge technologies in developing countries (remote sensing, ocean modelling, robotics)	HIGH
Creating equitable partnerships characterised by transparency, joint ownership, mutual responsibility and benefits for all partners	HIGH
Addressing GCRF challenge area “Secure and resilient food systems supported by sustainable marine resources and agriculture”	LOW/MEDIUM
Interdisciplinarity (collaborations which bring together a breadth of disciplines to effectively tackle the development challenges)	LOW
Developing global research networks	MEDIUM