



Sustainable Oceans, Livelihoods and food Security
Through Increased Capacity in Ecosystem
research in the Western Indian Ocean



Global Challenges Research Fund

Building research capacity to address the challenges of food security in Western Indian Ocean countries

Poor coastal communities are at the frontier of 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 socioeconomic research and hands-on training.





Marine technologies for societal challenges

Combining robotics, satellite data and models for cost-effective monitoring and predictions in data poor areas

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

Marine robotics is becoming ever more reliable and easy to use for making environmental observations – at a fraction of the cost of a research ship. Earth observation

satellites monitor the oceans daily, collecting a wide range of marine data – freely available.

Ocean models of increasingly high resolution make it possible to explore regional ecosystem dynamics, gain insights into reasons for variability and change, and deliver predictions to inform policy development, resource management and adaptation to future change.



Ecosystem shifts and stability of fisheries

Case study: Environmental drivers and socio-economic consequences of the South African Chokka squid fishery collapsing

The collapse of the Chokka squid fishery in 2013 had a devastating effect on the Eastern Cape, one of the poorest provinces in South Africa. The reasons for the collapse are unknown, although local fishermen believe it happened as a result of environmental change.

SOLSTICE will address key environmental

and anthropogenic factors controlling the ecosystem dynamics of the Agulhas Bank. The results will help explain why the fishery collapsed, and inform the fishery and government as to whether the current recovery is stable, or whether similar collapses are likely in the future.



Living marine resources and impacts of climate change

Case study: Pemba Channel small pelagic fishery under climate threat

The small pelagic fishery is important for local communities in Zanzibar and mainland Tanzania as a source of food security, nutrition and livelihood support.

This diverse group includes mackerel, sardines and anchovies which are found in schools over the continental shelf, in bays and in deep lagoons with nutrient rich waters. They are more abundant during the southeast monsoon, when stronger winds drive upwelling that brings nutrient rich water to the surface.

Despite its importance for coastal economies, there is a lack of data and information about the fishery, which hampers effective management.

Using robotics, modelling, remote sensing, field observations and socio-economic studies, SOLSTICE will identify key environmental and anthropogenic drivers of the main species and address climatic pressures on this fishery.



New frontiers for food security and economic growth

Case study: Emerging fishery of the North Kenya Bank, an opportunity for coastal populations

The North Kenya Bank fishery is expected to spur economic growth for local communities. If well managed, it could help achieve national development goals, including poverty alleviation and wealth creation. Sustainability requires informed management interventions, but there is only scant information on the ecological status and drivers of the fishery.

Using modelling, remote sensing, field observations and socio-economic studies, SOLSTICE will explore processes related to productivity and resilience of the ecosystems supporting the fishery, identify the main drivers of variability and change, and advise the fishery and government on how to optimise use of this important resource.

