



## Tanzanian and UK scientists develop affordable ocean drifters to investigate the sustainability of local fisheries

*Partners from the Tanzanian Institute of Marine Studies and the UK National Oceanography Centre deployed a series of user-developed satellite-tracked ocean drifters in the Pemba Channel in a de-risking exercise ahead of experiments with marine robots in 2019.*

The experiment used nine simple surface drifters that were constructed from inexpensive, off-the-shelf electronics, and locally available materials, to identify the complexity of flow in the lee of Pemba Island, north of Zanzibar, during the South-East monsoon season, the most energetic period for this part of the West Indian Ocean (WIO).

The deployment had two objectives. First, to better understand the small-scale dynamics of the flow of the Pemba Channel, which is not typically covered by established global drifter monitoring programmes; and second, to identify potential challenges and risks ahead of a more comprehensive SOLSTICE observational campaign due to take place in 2019, that will include deployment of submarine gliders from the National Oceanography Centre's National Marine Facilities – Marine Autonomous and Robotic Systems (NMF-MARS) fleet.

Zanzibar and mainland Tanzanian coastal communities are dependent on local small pelagic fish (anchovies, sardines, mackerel, threadfin and herring) for food

and income. The abundance of these fish varies from year-to-year, and these fluctuations may be linked with changes in the climate and marine environment, which can affect the food supply for both larval and adult fish. However there has been limited scientific research in this region, and consequently knowledge of the physical and biogeochemical mechanisms supporting these important fisheries is largely based on remote sensing and existing model data.



The drifter experiment successfully identified numerous physical features, including the fast-flowing central currents associated with incoming WIO waters, and persistent eddies in the lee of small islands and outcropping shallow reefs. Tidal modulation of these features was clearly evident, and the drifters that managed to

exit the Pemba Channel also identified the time dependency of flows into Kenyan waters to the north. These data will now be used – along with high resolution remote sensing data – to validate regional scale models to identify physical mechanisms contributing to productivity in the region.



The project outcome described in this Success Story contributes to the following objectives of the GCRF programme “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