

CRISe abstract for WIOMSA

Oral Presentation Requested

Abstract Title:

Application of satellite data as a tool for managing coastal risk and sustainable development in the South West Indian Ocean. The C-RISe Project

Authors:

D. Cotton¹ (d.cotton@satoc.eu), A.E. Becker^{2,3} (abeck@noc.ac.uk), E. Ash¹ (e.ash@satoc.eu), A. Hibbert² (anhi@noc.ac.uk), V. Byfield⁴ (valborg@noc.soton.ac.uk), C. Sams⁴ (chrams@noc.ac.uk), C. Maueua⁵ (clousamaueua@gmail.com), F. Nehama⁶ (fialho.nehama@gmail.com), H. Razafindrainibe⁷ (hajaniry@gmail.com), L. Randriamarolaza⁸ (luc.randriamarolaza@gmail.com), J Bemiasa⁹ (j.bemiasa@odinafrica.net), A Rabearisoa¹⁰ (arabearisoa@conservation.org), H. Rakotondrazafy¹¹ (hrakotondrazafy@wwf.panda.org), R. Pretorius¹² (HEaston@csir.co.za)

¹Satellite Oceanographic Consultants Ltd, 49 Seal Road, Stockport, SK7 2JS, UK

²National Oceanography Centre, 6 Brownlow Street, Liverpool L3 5DA, UK

³University of Liverpool, Dept of Geography and Planning, Liverpool L69 7ZT, UK

⁴National Oceanography Centre, European Way, Southampton SO14 3ZH, UK

⁵INAHINA, Karl Marx avenue, 153- 5/12, P.O. Box: 2089, Maputo, Republic of Mozambique.

⁶Universidade Eduardo Mondlane, Escola Superior de Ciências Marinhas e Costeiras, Av 1° de Julho, CP 128, Quelimane, Republic of Mozambique

⁷Centre National de Recherches Océanographiques, Sarodravay Marodoka, Nosy Be Madagascar

⁸BP 1254 Ampandrianomby, Direction Générale de la Météorologie, 101 Antananarivo, Madagascar

⁹Institut Halieutique et des Sciences Marines (IH.SM), University of Toliara, 48B042, Avenue de France, B.P. 141, TOLIARA-601, Madagascar

¹⁰Conservation International, II W 27 D – Rue Vitton Francois, BP 5178, Ankorahotra-Antananarivo 101, Madagascar

¹¹World Wide Fund for Nature, Antsakaviro, POBox 738 – 101, Antananarivo, Madagascar

¹²Council for Scientific and Industrial Research, Meiring Naude Road, Brummeria, Pretoria, 0002, Republic of South Africa

Abstract:

It is well established that global sea level is increasing and that large-scale weather patterns are changing. However, across large parts of the world, there is a lack of observational data from in-situ instrumentation available on which to implement evidence-based approaches to coastal adaptation. In the South West Indian Ocean, Mozambique, Madagascar and Mauritius have large coastal populations whose lives and economic security are vulnerable to the consequences of climate variability and change.

Access to improved regional information on coastal risk factors (sea level, wave and wind extremes) will improve plans to protect coastal communities and safeguard economic activity. This information also contributes to improving industrial and commercial competitiveness in the maritime sector, which is heavily dependent on access to accurate relevant oceanographic information

In the past it has been difficult to retrieve satellite altimeter data close to the coast, due to land contamination of the return waveform. Using an innovative coastal processor, developed by researchers at the National Oceanography Centre in the UK, a new satellite altimeter sea level dataset for the South West African coastline has been generated. These data are now being validated against available tide gauge data and analysed for regional characteristics in sea-level variability, including long-term sea-level trends.

These data, together with climatological ocean wind, wave and surface current data are being provided through C-RISe, a Coastal Risk Information Service, to partner organisations in Mozambique, Madagascar and Mauritius to inform decision making and reduce the impact of coastal inundation and increasingly variable weather patterns.

The three main objectives of C-RISe project are:

- Deliver a Coastal Risk Information service, providing satellite-derived information about coastal vulnerability to environmental threats such as sea-level rise and extreme wind and wave events.
- Apply and evaluate the C-RISe service through a set of Use Cases, applying the C-RISe products to end use applications meeting local priorities.
- Build local capacity to use satellite data for strategy development, governance and management of coastal areas to increase resilience to coastal hazards.

A key objective of C-RISe is to support the development of local capacity to access, process and apply satellite data. This is achieved through more than 30 Use Cases, led by partners in Mozambique and Madagascar, which are evaluating the C-RISe service in different application areas, including: maritime safety, coastal erosion, coastal defence planning, fisheries, and marine and coastal ecosystem management.

The C-RISe data sets are available through an online Data Portal developed and implemented by CSIR specifically for the project.

Local users are also being trained in the use of marine satellite data to quantify coastal hazards and incorporate this information into ongoing programmes. Two series of training workshops have been organised and held in Mozambique and Madagascar: “Wind, Wave and Sea Level Information from Satellites”, and “Tools to Apply Satellite Data to Coastal Risk”.

This presentation will introduce the project, summarise key findings, and present high level results from the Use Cases, highlighting areas of most benefit and greatest future interest.

C-RISe is funded by the UK Space Agency under the International Partnership Programme. The UK Space Agency’s International Partnership Programme (IPP) is a five-year, £152 million programme designed to partner UK space expertise with overseas governments and organisations. It is funded from the Department for Business, Energy and Industrial Strategy’s Global Challenges Research Fund (GCRF).