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ODINAFRICA

Inside this issue:

PERSONAL VIEW (editorial)

Alberto MAVUME (Physical Oceanographer)

Welcome to the Mozambique National Oceanographic Data and Information Center Newsletter. It's objective is to inform on the activities undertaken by the center, within the framework of ODINAFRICA[1] and related programs.

The present issue presents an article emphasizing the importance of the ARGO[2] data collected in ocean environments worldwide, including those of East Africa and the Mozambique Channel. ARGO is an array of 3000 free-floating buoys making vertical profiles (temperature and salinity) of the upper 2000 m of the ocean once every 10 days *(Fig 1).* These data allows us to address a new range of oceanographic problems, including the issue of tropical cyclone induced surface cooling and intensification, as indicated in the article *(page 5).*

The new data represent a challenge for data managers. The coastal data management systems should be modernized and integrated to promote interdisciplinary studies and provide useful information products to policy makers, fisheries and the general public.

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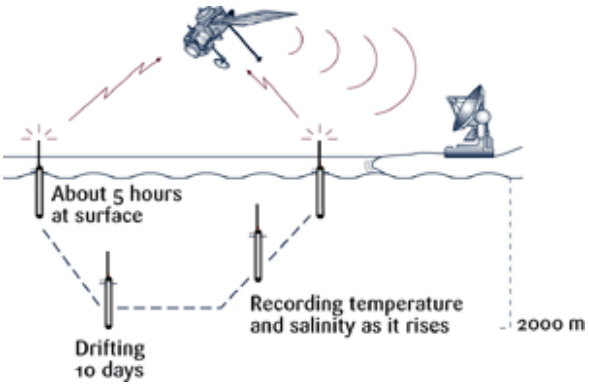

Fig. 1 Most ARGO floats drift at a depth of 1000 m for about 9 days, then they make a profile of temperature and salinity from 2000 m to the surface, after descending. Then they stay at the surface for about five hrs, sending the data to a satellite, after that they descend again to resting depth (1000 m).

[1]Ocean Data and Information Network for Africa

[2]Array for Real-Time Geostrophic Oceanography

ESTABLISHMENT OF THE SCHOOL OF MARINE AND COASTAL SCIENCES IN MOZAMBIQUE

Students in a laboratory

In 2006, the Eduardo Mondlane University established a School of Marine and Coastal Sciences at Quelimane, Mozambique. The University Strategic Plan that envisages curricula development, establishes new courses in emerging areas of major economic and social importance, and the expansion of the the university throughout the country. Furthermore, the establishment of the school is an appropriate response to the long-term trend of increased emphasis on oceans, coasts and associated resources.

The school's main mission is to promote professional teaching of degree courses in applied oceanography and marine biology, conduct applied research, and implement projects for sustainable use of natural resources.

Courses in marine chemistry and marine geology will be added shortly.

The UNESCO Chair in Marine Sciences and Oceanography and the the British Council, through the Academic Link with the University of Bangor created in 1997, contributed for the establishment of the school.

The school opened with 40 students and seven lecturers, in February 2006, and now it has 80 students and 11 full time lectures.

The school has been undertaking many applied research projects to achieve its mission, some of which are as follows: (i) assessment of shrimp catches in the northern Sofala Bank, (ii) production of microalgae (iii) assessment of the salt intrusion and its effects on the distribution and abundance of shrimp larvae and juveniles in the *Bons Sinais* estuary, (iv) use of remote sensing for surveillance of fishing boats, (v) promotion of sustainable management of mangroves in Mozambique trough reduction of anthropogenic pressure on the ecosystem, (vi) deployment of drifter buoys in the continental shelf at Sofala Bank. Furthermore an oceanographic buoy is being built at the school.

TRAINING ON OCEAN TEACHER AT SCHOOL OF MARINE AND COASTAL SCIENCES

Within the scope of implementation of the national activities, under the Odinafrica Project, a training workshop was conducted from 19 to 20 October 2007, at the School of Marine and Coastal Sciences, in Quelimane, Mozambique.

The workshop covered issues related to *OceanTeacher, African Marine Atlas* and the usage of ODIN web based information sources, namely *OceanDocs* and *Afrilib* and *types of buoys*. The workshop aimed at spreading the different strategies of data and information management.

In her speech Mrs. Clousa Maueua referred to the objective of OceanTeacher that is to provide training tools for Oceanographic Data and Information management, having stressed that they were used during IODE training courses, however can be used for

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self-training and continuous professional development. A demonstration was made.

She also gave a brief on the African Marine Atlas (AMA), with emphasis on the structure, objectives and usage. As shown, the AMA provides maps, images, (geospatial datasets on the marine environment) collated and compiled for provision to coastal resource managers, planners, decision-makers and the general students. The ESCMC students were very impressed with AMA and considered them possibility of developing an Atlas for Mozambique, with basic parameters on Physical and Biological Oceanography.

By the other side, Ms Ana Maria Alfredo conducted some demonstrations on the usage of Afrilib and OceanDocs, as key sources for literature research. She referred to those sources of information as a collective catalogue and an electronic e-repository of scientific publications on marine science and oceanography, respectively, which contain holdings of the institutions collaborating in Odinafrica.

In her last remarks, she highlighted the fact that OceanDocs enables researchers to make their works (conference papers, articles, technical reports and thesis) and themselves visible worldwide and, on course of that, she raised on an appeal for colaboration on populating the Moz repository. The occasion was extended for a meeting with the school library staff and the parts agreed on including the school holdings in Afrilib and OceanDocs.

Ms. Ana Maria Alfredo demonstrating to the students the usage of Afrilib and OceanDocs.

Regarding buoys and on the interest of the students which are building a buoy for anchor instruments to measure currents, Mr. Lucas António, a Commissioned Agent for INAHINA, in Quelimane, made a presentation on *types of buoys*. This theme brought the students to a clear understanding concerning the difference between navigational buoys and those for anchor instruments.

Working group at ESCMC. Quelimane, Mozambique

LIST OF FISH ASSOCIATED TO SEA GRASS BEDS IN INHASSORO, INHAMBANE PROVINCE, IN SOUTHERN MOZAMBIQUE

Research work on fish associated to sea grass beds in Inhassoro district, Inhambane province has been undertaken by the Center of Sustainable Development for the Coastal Zones (CDS-ZC). The research was funded by CENADO under the framework of ODINÁFRICA project. The aim of the study was to examine the diversity, abundance of the fish associated to sea grass beds, it was made in the eastern part of the coast of the Bazaruto bay in the village of Inhassoro, along the intertidal zone, from December 2006 to June 2007, covering an area of about 17 km of the shoreline.

The main objective was to measure the length parameters, species identification, the quantitification of the fish species from the trawl artisanal fish catches in sea grass beds exclusively and during the low tide. A total of 3.317 fishes have been sampled, distributed in 43 families and grouped in 102 species.

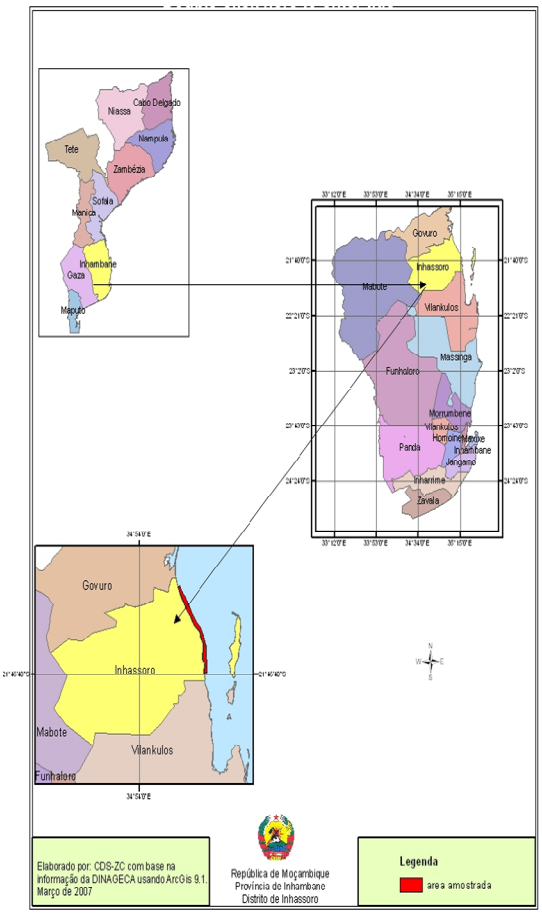

Figure 1- study area

The most common families were: *Carangidae, Haemulidae, Lethrinidae, Mullidae and Sphyraenidae*. In the remaining families, the number of identified species was below five (5).

A quantitative analysis indicate that the most abundant species is *Ovena Gerres (Gerredae),* with 968 individuals (29.18% of species identified) followed by the *Lenthrinus Lentjan (Lethrinidae)* with 409 individuals (12.33%) and *sutor Siganus (Siganidae)* with 301 individuals (9.07%). The length of the majority of specimens varied from 2 cm to 18 cm.

A comparison enters the average values of the observed total length and the average length of literature for each species, indicated the catch of lesser individuals that the adult size.

Bibliographic citation:

Balidy, HJ; HH Pacule; AT Guissamulo e M.J Mafambissa (2007). Lista de Peixes Associados aos Tapetes de Ervas Marinhas em Inhassoro. CDS-ZC. 19 pp.

A quantitative analysis, in Bazaruto bay, indicate that the most abundant species are *Ovena Gerres (Gerredae)*, the *Lenthrinus Lentjan (Lethrinidae) and the sutor Siganus (Sigani)*

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THE USE OF ARGO DATA IN STUDYING OCEAN RESPONSE TO TROPICAL CYCLONES

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Tropical cyclones represent the most extreme cases of air-sea interaction with energy that is supplied mainly from warm ocean waters through surface heat flux. Strong winds (Fig 1) associated with tropical cyclones induce entrainment of cold deep water into the mixed surface waters, resulting in strong cooling and a deeper mixed layer. The sea surface temperatures fall by several degrees in response to the passage of a cyclone.

Sea surface cooling of the order of 1°C takes place in large areas around the cyclone (typically within 100-250 km), whereas, in the cold wake along with the track, the SSTs may be much more decreased [3], up to 7-9°C (Fig 1). Mixing and upwelling also result in enhanced chlorophyll concentrations as indicated in Fig 2.

Due to severe weather conditions (e.g large surface waves, winds, and currents), as well as , unpredictable locations of TCs, it is not easy to acquire in-situ observations of an upper ocean during the passage of tropical cyclones.

However, in some cases, ARGO data have been available close to the locations of TCs, whereby it has been possible to obtain a much improved insight in the processes of sea surface cooling. Figure 3 shows one such example where four profiles over a 30-day period indicate first the warm (29˚C) and shallow (30m) mixed layer before the passage of TC Japhet, and then, after the passage, on 4 March, a deeper (60 m) and colder (26˚C) mixed layer. The change is due to a combination of upwelling (lifting the whole water column, resulting in a more shallow profile) and wind mixing (homogenising the upper mixed layer). Upwelling in this case is approx 60 m.

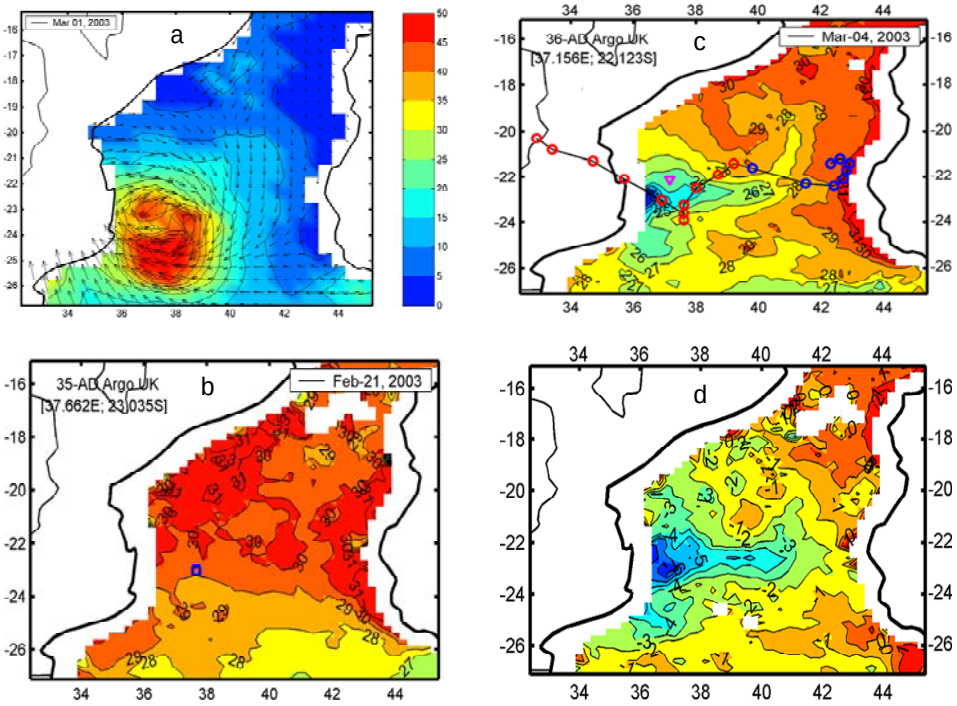

Fig. 1 (a) QuikSCAT winds (intensification) prior to Japhet landfall, (b) pre-cyclone and (c) post-cyclone sea surface temperatures left by TC Japhet in early March 2003. The line indicates cyclone track and circles show the 6 hourly position of the cyclone (from Feb 26) at given intensity as it moves towards west. (d) shows the SST change, with a maximum of about 7°C.

[3]References

Sakaida, F., Kawamura, H. and Yoshiaki, T. (1998). Sea surface cooling caused by typhoons in the Tohoku Area in August 1989. *J. Geophys. Res.*, **103**, 1053-1065

Emanuel, K.A. (1999). Thermodynamic control of hurricane intensity. *Nature* **401,** 665-669.

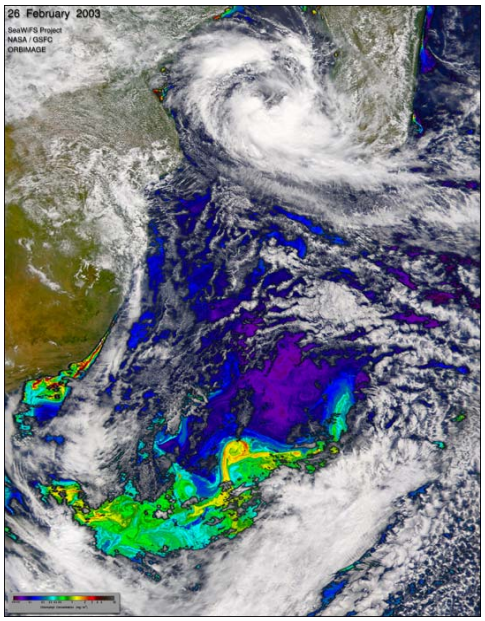

Fig. 2 On February 26, 2003, SeaWIFS captured this view of TC Japhet in the Mozambique Channel. Further south, enhanced chlorophyll concentrations are visible where the Agulhas Current interacts with the Antartic Circumpolar Current and sea floor.

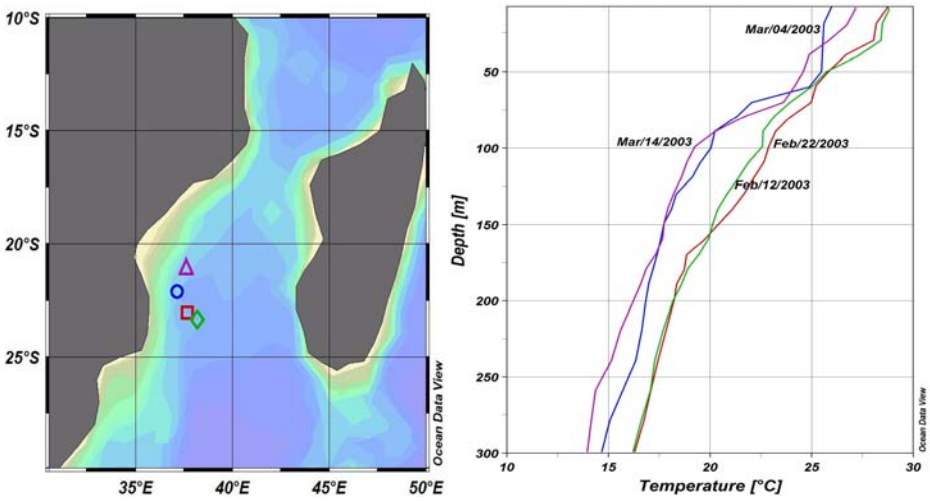

Fig. 3 Shows the position of the ARGO floats in the Mozambique Channel and the temp-depth profiles before (Feb 12, 22) and after (Mar 4, 14) TC Japhet. The float moved northward during this month, in accordance with the north-going current at the 1000m level. Upwelling according to the difference in the profile positions before and after the passage of TC Japhet is approx. 60 m.

THE OCEANOGRAPHIC CENTER

The Mozambique National Data and Information Center (CENADO), created in 1998 under the framework of ODINAFRICA, is hosted and coordinated by the National Institute of Hydrography and Navigation (INAHINA).

The center's main activities are, among others, the manipulation of data, preparation of data and information products, development of infrastructure for archival, analysis and dissemination of the data and information products.

Besides this, a Coastal and Marine Resources and Environment Meta-database was established. This Meta-database consist of Institutions, Scientists, Coastal districts Information, GIS layers, MPAs, softwares, data-sets, Documents, Programs and Projects.

ODINAFRICA- Ocean Data and Information Network for Africa. This network brings together marine institutions from twenty-five Member States of the Intergovernmental Oceanographic Commission of UNESCO from Africa.

For more information visit: http://www.odinafrica.net/