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Nu-shuttle fitted with a MINI^{pack} CTD-F to measure Conductivity, Temperature, Depth and Fluorescence, as well as an Autonomous Plankton Sampler (APS). It also has the capacity to carry a Fast Repetition Rate Fluorimeter FAST^{track} which gives oceanographers a unique insight into phytoplankton health.

The use of towed undulating oceanographic recorders is seen as a key activity in monitoring long-term trends within LMEs.

Chelsea Technologies Group (CTG) has delivered an instrumented towed undulating oceanographic recorder, Nu-Shuttle, to the Marine and Coastal Management Group of the Department of Environment and Tourism, Cape Town, South Africa to be utilised within their ongoing and future monitoring programs in the Benguela system. This acquisition has been funded by the Benguela Current Large Marine Ecosystem (BCLME) program, in which Angola, Namibia and South Africa jointly identify and manage trans-boundary resources of the BCLME.

Currently there are many ship-based monitoring and survey initiatives underway in the Benguela system. These include nationally-based fishery surveys, dedicated monitoring lines undertaken in the Benguela Environment Fisheries Interaction Training program and process-orientated cruises in the BCLME program examining frontal boundary regions such as the Luderitz-Orange River Cone, the Agulhas Current/Agulhas Bank mixing area, frontal features between upwelled and oceanic waters and the Angola-Benguela Front.

The Nu-Shuttle will first be used on the RV Africana and the RV Algoa to complement the routine St Helena Bay and SARP monitoring lines, which have been undertaken monthly since April 2000. The classical monitoring at fixed locations will be complemented by either towing continuously back along the monitoring line or by towing between stations and retrieving the Nu-Shuttle every 10 nautical miles. This will be repeated as often as possible for one year and the results will be compared to the fixed station data. Scientists from Namibia and Angola will be invited to Cape Town to participate in the cruises to enable them to build up experience in deploying, operating and retrieving the Nu-Shuttle and analyzing data collected at sea and in the laboratory ashore.

November 2005

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Next the equipment will be deployed on the monitoring line off Namibia on the RV Welwitschia and on the Namibe monitoring line in southern Angola during cruises of opportunity. The use of optical sensors for detection of phytoplankton groups or HABS using an optical plankton counter for zooplankton may be added in the future to the sensor payload.

The use of towed undulating oceanographic recorders is seen as a key activity in monitoring long-term trends within the world's 64 Large Marine Ecosystems (LMEs). It has been recognised since the early 1990's that such tools can provide very extensive datasets over large areas at reduced costs using research vessels. The value of such datasets is clearly demonstrated by NMFS, Narragansett Laboratory where the Continuous Plankton Recorder (CPR) surveys have been running from the late 1960s to present.

The Nu-Shuttle supplied for the BCLME programme is fitted with a MINI^{pack} CTD-F to measure Conductivity, Temperature, Depth and Fluorescence, as well as an Autonomous Plankton Sampler (APS). The MINI^{pack} CTD-F is a small, robust and high performance CTD-F. Since it became available, the MINI^{pack} CTD-F has become the central hub of all CTG towed vehicle systems, as well as finding applications on underway flow through systems such as CTG AquaLine Ferrybox System, when used in conjunction with its flow-through manifold.

The Autonomous Plankton Sampler (APS) was developed together with PML as a modern replacement for such sampling mechanisms as that used by the CPR and includes improvements such as motorised advancement of the gauze (indexed advance) and programmable sampling routines. It was designed to maintain data compatibility with the CPR and other monitoring programmes, the hydrodynamics matching those of the Hardy mechanism.

Also, a great deal of interest has been placed in fitting the towed undulating vehicle with a Fast Repetition Rate fluorimeter (FAST^{tracka}). This will allow inclusion of primary productivity data with the main dataset. The FAST^{tracka} has been successfully operated within the LME assessment Nu-Shuttle systems run from the NMFS* in Narragansett, and it may be considered as one of a number of optical instruments to be fitted in the future to the Nu-Shuttle.

Note: *Use of the Nu-shuttle by NMFS does not constitute endorsement by the US Government.

The Chelsea Technologies Group is represented in Southern Africa by SMD Telecommunications CC.

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