

Project Number: 200103

Project START year: 2002

Project END year: 2002

Project Manager ; Mike Burczynski

CORE CTD DATA - MDUC

1) Abstract

CTD data collected using MBARI ROV, underway and profiler CTD systems have been designated as core data streams. Support for the maintenance, calibration and configuration of the instruments, electronics and related support hardware as well as support for the processing and archiving of the data, is provided on an institutional basis rather than through individual projects or divisional budgets.

The primary elements of this project are:

- Maintenance, configuration and calibration of MBARI CTD instrumentation and all associated system hardware.
- Maintain measurement accuracy and reliability required for core CTD data.
- Data processing, archiving and dissemination through the BOG database.
- Data validation through Science data “champions”, Reiko Michisaki for the Profiler CTD, Bruce Robison for the ROV CTD, and Gernot Friederich for CTD mapping. Monthly status reports are to be given to MDUC.

The project budget will include expenses for instrument maintenance and calibration, related hardware and electronics, system upgrades, related tools and consumable supplies, CTD Technician time for maintenance, data processing, and data integrity issues and minimal IAG time for software support and development. Additionally, efforts are planned to continue purchasing additional sensors for use as spares in the calibration rotation and to standardize instruments of a certain type.

This project is expected to operate in 2002 as it currently does. The only planned modification is the relocation of the Western Flyer mapping system to the wet lab, and the acquisition of updated Windows based software to run the CTD's.

A determination was made via MDUC that we should not plan to operate the large Seabird 911 rosette onboard the R/V Zephyr in 2002. However, it will be feasible to fit the smaller “Johnson” rosette for 2002 offshore operations. Provisions for operating or acquiring another Seabird 911 for the R/V Zephyr are not included in this proposal or budget. Additionally, the MDUC decided that any AUV related science sensors will not be considered as core, and therefore not in the scope of this project.

2) Proposal

MBARI has designated as 'core' the most mature, accurate, reliable and important measurements of its scientific instrumentation platforms. The purpose of this project is to continue to maintain and support the CTD and related data streams that have been designated as core.

MBARI has designated the following as core data streams:

- **ROV CTD** (Tiburon and Ventana), Conductivity, temperature, pressure, dissolved oxygen and light transmission measurements are considered core.
- **Profiler CTD** (2 SeaBird 911 + 12 position 10 liter system) Conductivity, temperature, pressure, dissolved oxygen, light transmission and fluorometer measurements that are made with MBARI maintained CTD instrumentation on MBARI sponsored and funded cruises are considered core.
- **Underway CTD** (Point Lobos and Western Flyer) Conductivity, temperature, fluorometer, light transmission and navigation position data obtained with MBARI maintained instrumentation is considered core.

Scope – core, core-related and non-core equipment. All core data support hardware and electronics are to be maintained with the same level of commitment, under the same budget and by the same individual as the actual core sensors. These systems must all operate in order for the data stream to maintain its integrity; thus it seems logical to lump them into the same pool of support. These systems are in essence core-related equipment. This includes items like computers, cables, pumps, CTD housings and frames, terminations, etc. Additionally, this budget will cover some items that are not themselves part of the core data stream, however they are so closely related to the rest of the systems that it only makes sense to manage the items in this project. This includes the following items: Niskin CTD bottles, Altimeter, refurbishment for GO pylon, and vessel and ROV related CTD infrastructure.

Changes compared to the 2001 Core CTD project. This 2002 proposal reflects our experience to date with the 2001 Core CTD project. A large effort in 2001 was made to upgrade our systems, and acquire additional spare instrumentation. Therefore we are in a much better position now to realistically estimate the instrument maintenance, calibration, and replacement expenses required to properly maintaining the MBARI CTD instrument infrastructure. Consequently, we are submitting a budget for 2002 that is less than 2001.

The 2002 Core CTD project includes:

- Acquisition and testing of Windows based operations software for Sea Bird systems.
- Necessary upgrades and yearly service for the existing CTD hardware.
- Continuing with the purchase of spare sensors for ALL of the systems.
- Relocation of Western Flyer UCTD.
- Begin evaluation of new Sea Bird O2 sensors for use on Profiler CTD and ROV CTD.
- Continue the evaluation of new fluorometers to replace the extremely old SeaTech units. Designate a new model to be used as the institutes core CTD fluorometer.
- Purchase of fluorometers to phase out the existing Sea tech Flashlamp obsolete units.
- Improvements to data processing and loading techniques via enhanced scripts.

- Improvements to the instrument Access database

Data Quality Specifications. We will continue to evaluate our accuracy estimates for the core CTD and related data. Pre and post use calibration information will be analyzed to determine the accuracy of each of our core instrument types. The present instrument accuracy quotes from the manufacturer will be reviewed and modified if needed. The present specifications are, 0.1-dbar pressure, 0.01 salinity, 0.01 C temperature, 0.1 ml/l dissolved oxygen and 1% light transmission.

Data processing, archiving, dissemination, and quality control. The data processing scheme will operate much the same way as in 2001. The DMO Instrumentation Technician will serve to maintain and archive the SeaBird processing scripts for the Profiler and Underway CTD data acquired with MBARI core instruments. This will include the evaluation and improvement of the current processing and loading techniques. Major changes may be required if the Windows based Sea Bird CTD data acquisition software is adopted. The DMO Instrumentation technician will serve to interface with external data users, train others to run the CTD systems, maintain the MBARI procedures for running the CTD systems, and train others to use the CTD processing software. IAG will provide similar support as last year – modifying as required and maintaining the unix processing and logging jobs for the data streams. The data champions are requested to present the results of the monthly data verification and quality control checks to the MDUC committee

Instrument calibration/maintenance database. The Access database containing all the instrument calibration and model information will continue to be maintained and updated. This system will be used to monitor instruments that need calibration or yearly service. The DMO Instrumentation Technician will make improvements to the database that will allow it to be a more powerful and user friendly tool. A new database structure will be developed through the addition of table keys and the creation of table relationships. New forms will be built to query the database and will include user-friendly features such as dropdown boxes and command menus. The improvements will allow the user to easily cross-reference multiple tables and obtain the desired information in a rapid and accurate method.

Project Team. The Core CTD data team includes:

- Mike Burczynski (Project Manager, MDUC, CTD Technician, DMO)
- Gernot Friederich (Data Champion for mapping CTD, Science)
- Reiko Michisaki (Data Champion for Profiler CTD, Science)
- Bruce Robison (Data Champion for ROV CTD, Science)
- David Caress (MDUC Chair, Science)
- Rich Schramm (IAG, MDUC)

3) Budget (new and continuing projects)

The 2002 budget includes the following:

- 160 days DMO Instrument Technician for CTD hardware support and data processing.
- 5 days Science Gernot Friederich (Data Champion for mapping CTD)
- 5 days Scientist (Bruce Robison) for data validation as Data Champion
- 6 days Research Specialist (Reiko Michisaki) for data validation as Data Champion
- 20 days IAG Software Engineer for general software and evaluation of data specifications and accuracy.
- 4 days IS Administrator for network and computer support.

4) Milestones

	Milestone 1	Milestone 2	Milestone 3	Milestone 4	Milestone 5	Total Resources ¹ for each resource category for all milestones listed here
Milestone date	2-2002	3-2002				
Milestone description	Test new operating software	Relocate UCTD on Flyer				
EE						
SE						
ME						
IAG						
ME Technician						
EE Technician						
Machine Shop						

¹ This number should be same as the number you entered on the resource requests for this particular resource