

Project Manager: Mike McCann

# MOOS Data Management



*Requested Incremental Budget: \$15,750*

*Total Project Costs, Including Labor:*

*Duration of Project: 1 year*

*Date Submitted: Sept. 1, 1999*

*Lead Scientist: Francisco Chavez*

*Lead Engineer: Todd Anderson*

*Project Team: Reiko Michisaki, Brian Schlining, Holly Baum, Mike Matthews, Bob Herlien, Duane Edgington, Dan Davis*

*Summary of Resources Requested (Total No. of days per Division for 1999):*

*R&D Total: 269 (160 IAG + 39 Sci + 70 Engr)*

*TSD Total:*

*DMO Total:*

*ITD Total:*

## 1) Abstract

The purpose of this project is to address issues of mooring data management and representation. There are three prongs to this work:

- A. Strategic planning for methods to deal with MOOS data streams.
- B. Coordination with the Instrumentation Software Infrastructure for MOOS project.
- C. Developing data access tools for existing OASIS data, serving as a prototype for future MOOS data.

Combining these three activities into one project is appropriate, as the overall goal is to provide accurate and precise observations of oceanographic phenomena. Coordination among these activities is required if we are to meet our short- and long-term needs.

## 2) Proposal

### a) The problem addressed

#### A. Strategic Planning

Data management and representation issues were not fully addressed in the February 1999 MOOS planning workshop. The February workshop identified the issue of shore-side MOOS data management as deserving its own separate discussion. This issue requires strategic planning.

#### B. Coordination with Instrument Software Infrastructure for MOOS

New software technology is being proposed for interfacing with MOOS sensors (the Instrument Software Infrastructure for MOOS proposal). This will provide new capabilities for up-front sensor identification, application of calibrations, and other features that require a close coordination with the data management development activities that are part of this proposal.

#### C. Operational data management effort

This effort will enhance our operational mooring data management system. The general goal for this system is to provide first-level quality-controlled mooring data to the web. Systems like this have been developed before, but proved difficult to maintain as they were structured such that the software developer was the sole maintainer. A high priority in this work will be to develop tools such that the end users will participate in the data management and quality control.

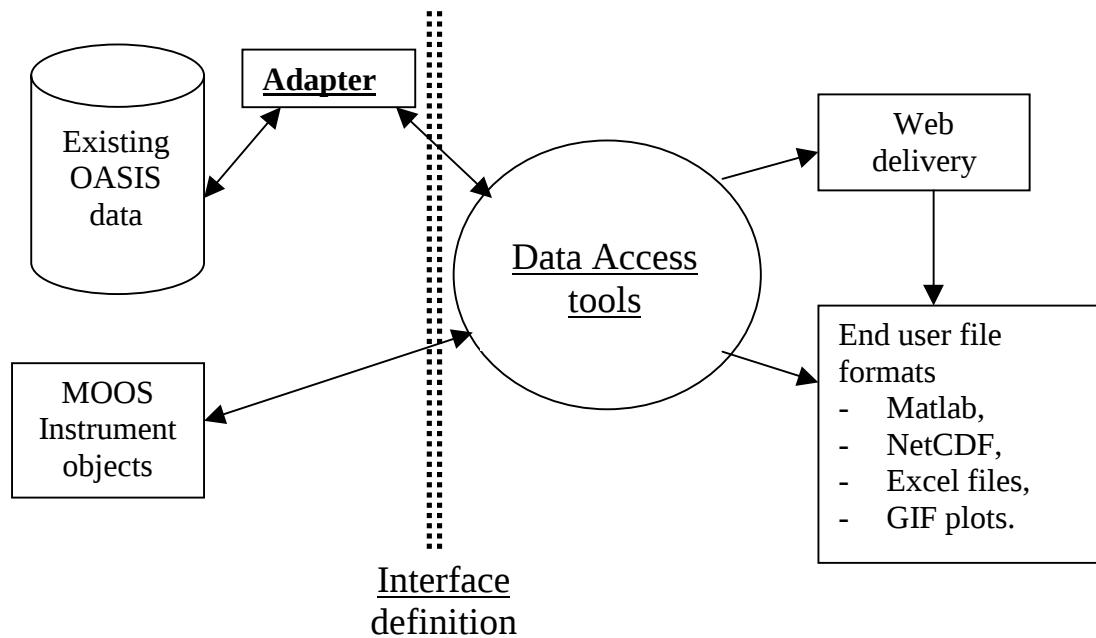
### b) Approach to the problem

### A. Strategic Planning

Other organizations are similarly involved in the collection and distribution of data in near real-time from oceanographic platforms. We expect to learn much from these efforts to help focus our strategic planning. A project member(s) will visit these institutions or have them visit MBARI to exchange information and present seminars. In addition, this project will hold a workshop on shore-side MOOS data management.

### B. Coordination with Instrument Software Infrastructure for MOOS

The definition of an interface to MOOS instrument objects and to an adapter written for the existing OASIS data will be developed. Object oriented software design and development techniques will be used in this effort. The diagram below identifies the new areas of development, indicated as underlined bold text.



### C. Operational data management effort

We propose to develop the system for a few measurements, one meteorological (wind speed and direction), one physical oceanographic (temperature at 11 levels), one chemical (delta pCO<sub>2</sub>) and one biological (chlorophyll estimated from radiometry). This effort will coordinate with the design and implementation used in the “New Mooring Controller Project” (starts in June 1999). Where possible the software design of the mooring data management project will be coordinated to more easily handle the data from the new mooring controller. This will lead to a more integrated overall data collection and processing system for future mooring data. For the same reason, this effort will monitor the design and implementation used in “Instrumentation Software Infrastructure for MOOS” project.

Object oriented software design and development techniques will be used to produce an operational data management system. This development will try to incorporate any strategic planning results but

these efforts will proceed concurrently. In addition, the design will try and be as consistent as possible with Instrument Software Infrastructure project by communication with those project members.

### **c) Specific deliverables**

#### A. Milestones for strategic planning

Milestone A-1: Internal MOOS Data Management and Representation workshop.

Milestone A-2: Report documenting results from MOOS Data Management and Representation Workshop.

#### B. Milestones for Coordination with Instrument Software Infrastructure for MOOS

Milestone B-1: Preliminary Design Review of Interface Definition for communication with prototype MOOS Instrument object. (Identify system components, functions, data and interactions. Develop system model document and high level design of components to implement the model. Design will include an adapter to allow archived OASIS mooring data to simulate future MOOS instrument objects. This way the tools developed for MOOS instruments can also be used for the existing operational instruments.)

Milestone B-2: Implementation plan submitted as a year 2001 proposal.

Milestone B-3: Critical Design Review.

Milestone B-4: Prototype data management tool for prototype instrument object.

#### C. Milestones for operational data management effort

Milestone C-1: Enhancements to the existing operational OASIS system.

### **d) Project team**

Mike McCann: Project manager, evaluation of other systems, coordinate and document results from MOOS data management workshop leading to strategic data management plan.

Francisco Chavez: Advise on user requirements for operational system.

Todd Anderson: Design of instrument object interface and adapter. Operational data management system implementation.

Holly Baum: Design of instrument object interface and adapter. Operational data management system implementation.

Reiko Michisaki: Assist with implementing the operational data management system - defining system requirements and prototyping.

Brian Schlining: Assist with design of object interface and adapter. Assist with implementing the operational data management system – defining system requirements, architecture, and prototyping.

Bob Herlien: Coordinate with Next Generation OASIS controller development.

Mike Matthews: Strategic planning and advise on system design.

Dan Davis: Strategic planning and system design.

Duane Edgington: Liaison with Instrumentation Software Infrastructure for MOOS project team.

### **3) Budget**

#### Year 2000 budget:

Seminar speaker travel and honoraria is required to bring experts in the field of data management to MBARI (\$2000)

Travel to other data centers is required to really understand how others are handling similar kinds of data management issues (\$3750)

Two-day off-site workshop is required for strategic planning and consensus building (\$5,000)

Outside consulting services for workshop facilitator (\$3000)

Outside consulting services for computer consulting (\$2000)

## PROJECT SUMMARY

**Notes:** Labor, Fringe and Ship Costs will automatically be updated after data input phase.  
 Total project costs will be calculated at that time  
 If multi-year project - submit separate file for each year (name yr1, name yr2, etc)

PROJECT TITLE: MOOS Data ManagementEXISTING PROJECT?: YES ☐ NO ☒

PROJECT NUMBER: \_\_\_\_\_

LEAD SCIENTIST: Francisco ChavezLEAD ENGINEER: Todd AndersonPROJECT MANAGER: Mike McCann☐ Multi-Year?YEAR: 2000DATE LAST UPDATED: 8/31/99

## PROJECT COST SUMMARY

## Revenue

Revenue / Reimbursement Total \$ -

## Expense

|                      |           |                   |
|----------------------|-----------|-------------------|
| DIRECT LABOR         | \$        | 89,386.08         |
| LABOR FRINGE         | \$        | 38,436.01         |
| INTERNAL SHIP        | \$        | -                 |
| CAPITAL              | \$        | -                 |
| ALL OTHER EXPENSE    | \$        | 15,750.00         |
| <b>PROJECT TOTAL</b> | <b>\$</b> | <b>143,572.09</b> |

FORM UPDATE

5/18/1999 4:32 p.m.

[illegible]

**PROJECT NAME** MOOS Data Management  
**LEAD SCIENTIST** Francisco Chavez  
**LEAD ENGINEER** Todd Anderson  
**PROJECT MANAGER** Mike McCann

|                                                                                                                                                                                                                                                                                                                                                          | POINT LOBOS<br>ONLY | POINT LOBOS/<br>VENTANA | WESTERN FLYER<br>ONLY | WESTERN FLYER/<br>TIBURON | OUTSIDE<br>SHIPTIME * | OUTSIDE<br>SHIPTIME * |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------|-----------------------|---------------------------|-----------------------|-----------------------|
| <b>SEA DAYS</b> (insert # of days)                                                                                                                                                                                                                                                                                                                       | 0                   | 0                       | 0                     | 0                         | 0                     | 0                     |
| <b>DOCKSIDE / MOBILIZATION<br/>DAYS</b> (insert # of days)                                                                                                                                                                                                                                                                                               | 0                   | 0                       | 0                     | 0                         | 0                     | 0                     |
| <b>TRANSIT TIME</b> : extended cruise time<br>charged to project (insert # of hours)                                                                                                                                                                                                                                                                     | 0                   | 0                       | 0                     | 0                         | 0                     | 0                     |
| <b>Preferred Usage:</b><br><b>Examples:</b> <b>a)</b> 10 consecutive days<br>(Santa Barbara) requiring 2 days each<br>mob/demob; <b>b)</b> (2) 3-day groupings in<br>March & September (time series); 1/2 day<br>mob needed in March for software<br>installation; <b>c)</b> Outside shiptime: 7 days<br>JOHN MARTIN throughout year for<br>mooring work |                     |                         |                       |                           |                       |                       |
| <b>Special Requests</b> (night dives,<br>extended days, etc.)                                                                                                                                                                                                                                                                                            |                     |                         |                       |                           |                       |                       |
| PCO/RSC use only:<br>Actual At-sea Days Allocated:                                                                                                                                                                                                                                                                                                       |                     |                         |                       |                           |                       |                       |

**OUTSIDE SHIP TIME \***: All Project Managers are required to secure their own outside ship time, though DMO will assist as applicable.  
 Outside ship time expense must be budgeted in expense sheet. (See DMO for rates)

| <b>Extended Costs</b>   | <b>Rate</b> | <b>Extension</b> |
|-------------------------|-------------|------------------|
| Point Lobos only        | \$ 4,828    | \$0              |
| Point Lobos/Ventana     | \$ 7,738    | \$0              |
| Dockside / Mobilization | \$ 3,869    | \$0              |
| Western Flyer only      | \$ 11,056   | \$0              |
| Western Flyer/Tiburon   | \$ 16,499   | \$0              |
| Extended Hours          | \$ -        | \$0              |

**SHIP COST TOTAL (internal)** \$ -

Project: 0

Please mark all dates for which shiptime **WILL NOT** be feasible for your project with a bold "X" and comment as needed.Please mark specific dates or time periods for which shiptime is **MANDATORY** for meeting your project milestones with a bold "M" and comment as needed.

|           | 1 | 2 | 3 | 4                                     | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                              | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |  |
|-----------|---|---|---|---------------------------------------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|---------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|--|
| EXAMPLE 1 |   |   |   | <                                     | < | M | > | > |   |    |    |    |    |    |    | <  | <  | X  | X                               | X  | X  | X  | X  | X  | X  | X  | X  |    |    |    |    |  |
| comments  |   |   |   | testing new eqpmt first week of month |   |   |   |   |   |    |    |    |    |    |    |    |    |    | tentative cruise on New Horizon |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JANUARY   |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| FEBRUARY  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| MARCH     |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| APRIL     |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| MAY       |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JUNE      |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| JULY      |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| AUGUST    |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| SEPTEMBER |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| OCTOBER   |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| NOVEMBER  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| DECEMBER  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
| comments  |   |   |   |                                       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |                                 |    |    |    |    |    |    |    |    |    |    |    |    |  |
|           | 1 | 2 | 3 | 4                                     | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19                              | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |  |

11/30/99

9:25 AM

| Project-No          | Acct-No | Account Name                         | Line-Item Description                           | Amount  |
|---------------------|---------|--------------------------------------|-------------------------------------------------|---------|
| PROJECT NUMBER: 540 | 1       | Outside Services - General           | 2-day outside workshop                          | \$5,000 |
| PROJECT NUMBER: 540 | 1       | Outside Services - General           | Workshop facilitator                            | \$3,000 |
| PROJECT NUMBER: 412 | 1       | Travel - Domestic - Transportation   | Travel for seminar speakers                     | \$1,000 |
| PROJECT NUMBER: 920 | 1       | Honorariums                          | Outside seminar speakers                        | \$1,000 |
| PROJECT NUMBER: 520 | 1       | Outside Services - Computer          | Misc. services                                  | \$2,000 |
| PROJECT NUMBER: 410 | 1       | Travel - Domestic - Lodging          | Travel to explore other data management systems | \$1,000 |
| PROJECT NUMBER: 411 | 1       | Travel - Domestic - Meals/Incidental | Travel to explore other data management systems | \$750   |
| PROJECT NUMBER: 412 | 1       | Travel - Domestic - Transportation   | Travel to explore other data management systems | \$2,000 |