MBARI-CIMT Mooring

Deployed June 2004

June 18, 2004

Kent Headley, MBARI

MBARI-CIMT Mooring Summary

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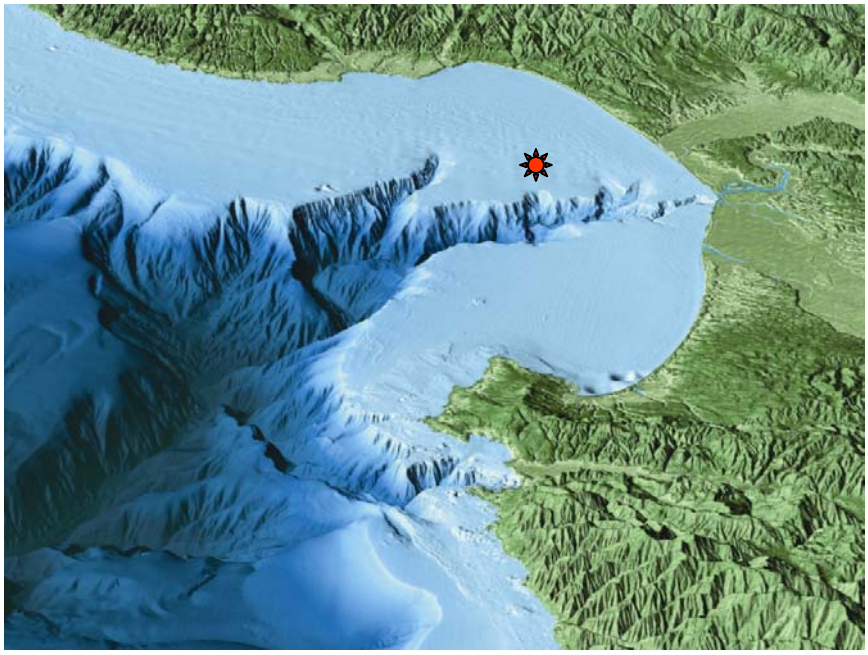
Photo byKent Headley



Mooring Location in Monterey Bay
Source Unknown

Location	Latitude 36° 50' 0“ N Longitude 121° 53' 0" W
Depth	70 m
Data Telemetry	6 MB/Day
Data Telemetry System	Freewave 900 MHz radio 38400 bps
Deployment Duration	June 2004 – June 2005
Buoy	Monterey Ocean Observing System (MOOS) Upper Water Column Configuration Height 5.2 m Diameter 2.3 m Weight 1431 kg Power System Solar Array + Battery, 20W continuous
Cable	Chain Catenary 2:1 scope Trawl Resistant Anchor Anchor Weight 1068 kg

Controller	MBARI MOOS Mooring Controller Intel SA1110 @ 192 MHz 16 MB Boot Flash 64 MB SDRAM 4 GB Compact Flash Instrument Ports 12 x 12 VDC 12 A, RS232 TI MSP430 Sub-Processor
System Software	Intrynsic Linux 4.2 IBM J9 3.1 Java Virtual Machine MBARI Software Infrastructure and Applications for MOOS (SIAM)
Data Archive	MBARI Shore Side Data System (SSDS)
Instrument Pucks	Texas Instruments MSP430 1 MB Flash Memory

MBARI-CIMT Deployment Mission

The deployment of the MBARI-CIMT mooring in June 2004 is one of several major milestones on the Monterey Ocean Observing System (MOOS) technical development roadmap. MOOS is a development program of observatory technologies and systems integrated with multiple field deployments and science experiments. The ultimate goal of MOOS is for the technologies and systems to be adopted by community observatory programs.

The MOOS technologies are intended to enable the implementation of both buoy based observatories and cabled observatories which significantly expand visibility into ocean processes.

The key MOOS technologies include:

MOOS buoy and EOM cable to	Extend high speed mooring data connectivity and power delivery to the sea floor
MOOS mooring controller (MMC)	Networkable, low power mooring controller
Instrument Pucks	Stores instrument service code and metadata to enable Plug-n-Work configuration
Software Infrastructure and Applications for MOOS (SIAM)	Provides interconnectivity, automatic platform configuration, metadata handling and new sampling capabilities
Shore Side Data System (SSDS)	Provides data archiving and retrieval services (including processed data sets), metadata management and data processing history tracking.
AUV and AUV docking	Extends the boundaries of the observatory and enables automated response to events of interest
ROV cable laying	Enables installation networking and power system infrastructure
Vertical profiling	Enables fine scale observation of the water column and participates in event response

The deployment, made in conjunction with the Center for Integrated Marine Technology (CIMT), provides externally visible science data return as well as field-testing the mooring system design: power and telemetry systems, MOOS mooring controller (MMC), software infrastructure and applications for MOOS (SIAM) and the shore-side data system (SSDS). The deployment does not incorporate any of the EOM cable, AUV or vertical profiling elements. This is consistent with the overall MOOS program goal of setting milestones for the engineering development of intermediate science deployments that provide real data products while verifying the design.

The science mission for the CIMT deployment will focus on bloom formation inside Monterey Bay; the mooring will be located where blooms potentially reach their maximum levels. Once water enters the bay, it slows and stratifies leading to optimal conditions for phytoplankton growth. This stratification acts to select for taxonomic groups (pennate diatoms, dinoflagellates) that are capable of producing toxins that are harmful to humans. Collectively, an array of such moorings may allow Monterey Bay to serve as a useful microcosm for the California coastal upwelling system.

With an emphasis on satisfying core requirements of operational and science users, the 2004 MBARI-CIMT mooring deployment promises to flush out remaining technical issues and begin the transition of MOOS to operational status.

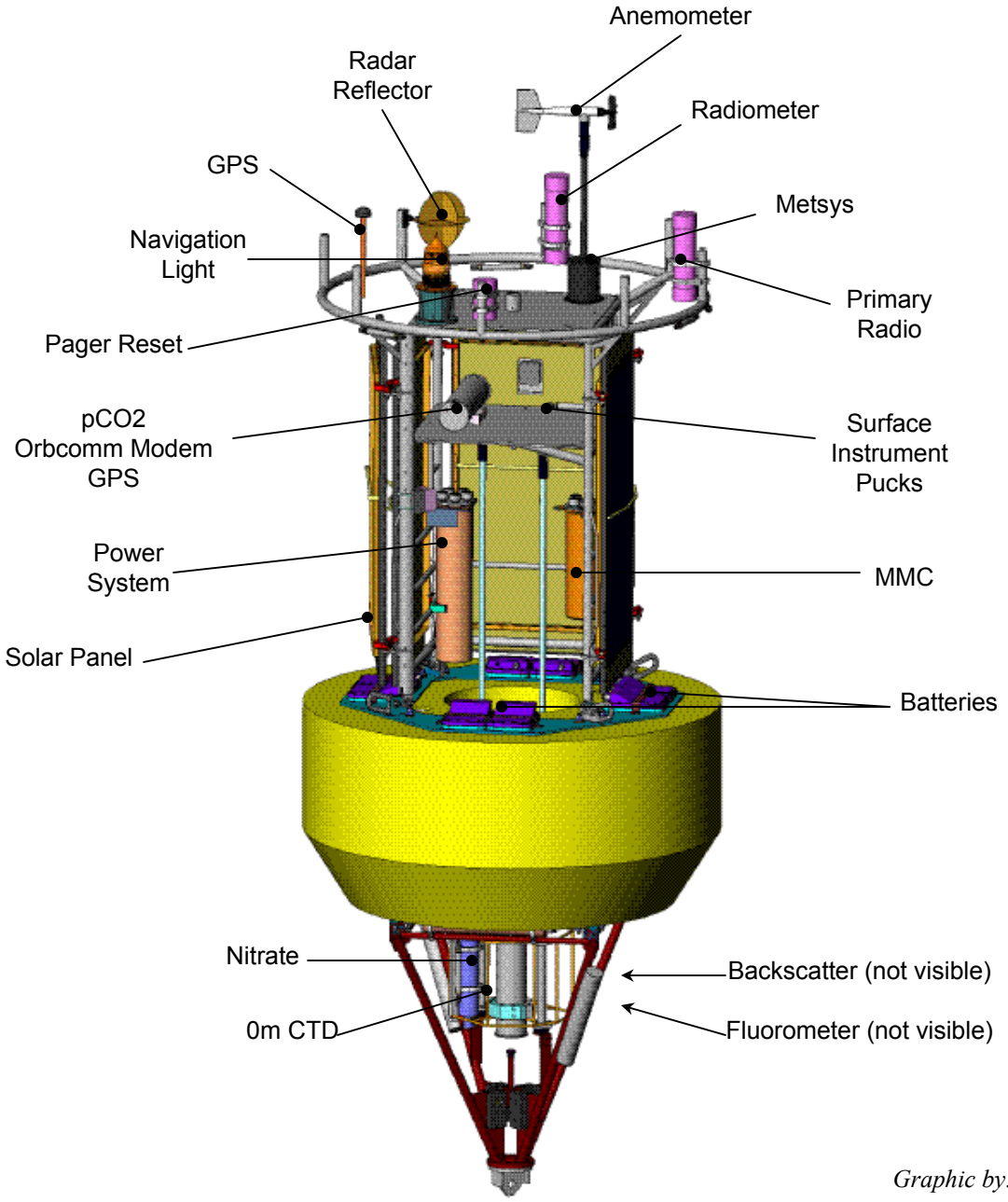
Instrumentation Summary

The MBARI-CIMT mooring hosts a broad suite of instruments for making measurements of scientific, engineering and operational interest.

The table below describes the mooring instrumentation.

Instrument	Function	Mfg	Model	SSDS Device ID	Sample Interval (s)	Location
Metsys	Wind Speed Wind Dir Relative Humidity Barometric Pressure	MBARI	Metsys	1321	600	tower
ADCP	Ocean Current	RDI	Workhorse	1267	600	5mCage
Spare	-	-	-	-	-	-
Spare	-	-	-	-	-	-
Serial CTD	Conductivity Temperature Depth	Seabird	SBE-37SMP	1314	600	elevator
Inductive CTD 10m	"	Seabird	SBE-37IMP	1318	600	10mCable
Inductive CTD 20m	"	"	SBE-37IMP	1317	600	20mCable
Inductive CTD 40m	"	"	SBE-37IMP	1316	600	40mCable
Inductive CTD 60m	"	"	SBE-37IMP	1315	600	60mCable
Nitrate	Nitrate	Satlantic	ISUS	1268	600	elevator
CO2	pCO2	MBARI	Gashound/SOON	-	600	tower
Radiometers	Downwelling Irradiance (Lu)	Satlantic	OCR3000	1320	600	tower
Radiometers	Downwelling Irradiance (Lu)	"	OCR3000	1326	600	5mCage
Radiometers	Upwelling Radiance (Ed)	"	OCR3000	1312	600	5mCage
Radiometers	Downwelling Irradiance (Lu)	"	OCR3000	1324	600	10mCage
Radiometers	Upwelling Radiance (Ed)	"	OCR3000	1325	600	10mCage
Fluorometer	Fluorescence	Wetlabs	ECO-FL	1279	600	elevator
Backscatter	Optical Backscatter	Wetlabs	ECO-BB	1301	600	elevator
Locator	Position (lat/lon)	MBARI	Orbcomm/SOON	1323	300	tower
GPS	Position (lat/lon)	Garmin	GPS16/17	1313	600	tower
Primary Radio	Data Telemetry	Freewave	FGR-115WC	-	-	tower
Secondary Radio	Maintenance Telemetry	Freewave	FGR-115WC	-	-	tower
Shore Radio	Telemetry	Freewave	FGR-115C	-	-	-
Power System Data	Power System Status	MBARI	-	1322	-	-
MMC Housing Monitor	Mooring Controller Housing Temperature, Pressure, Humidity, Mooring Turns	MBARI	-	1300	-	MMC
MMC Node	Mooring Controller Software Status	MBARI	-	1299	-	-
Pager Reset	Remote reset	MBARI	-	-	-	-

Instrumentation Map



Graphic by: Jon Erickson

5m Cage

ADCP
Radiometer (2)

Mooring Cable

10 m: Radiometer (2)
Inductive CTD

20 m: Inductive CTD

40 m: Inductive CTD

55 m: Inductive CTD

Acknowledgments

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Further Reading

- MBARI Website
  - http://www.mbari.org
- CIMT Website
  - http://cimt.ucsc.edu