

CRUISE REPORT
FOR
MMS CRUISE CAMP 1-2
of the
CALIFORNIA OCS PHASE II MONITORING PROGRAM

February 18, 1987

Performed for
U. S. Department of the Interior
MINERALS MANAGEMENT SERVICE
Pacific OCS Office
1340 West Sixth Street
Los Angeles, California 90017

by

BATTELLE
Ocean Sciences and Technology Department
Ventura Office
1431 Spinnaker Drive
Ventura, California 93001

Prepared by
James F. Campbell
Chief Scientist on Cruise

TABLE OF CONTENTS

	<u>Page</u>
LIST OF FIGURES - - - - -	i
LIST OF TABLES - - - - -	ii
1.0 INTRODUCTION - - - - -	1
2.0 CRUISE OBJECTIVES - - - - -	4
3.0 RESULTS - - - - -	4
3.1 Navigation - - - - -	6
3.2 Box-Core Sampling - - - - -	23
3.3 Biology - - - - -	23
3.4 Chemistry - - - - -	25
3.5 Sedimentology - - - - -	26
3.6 Core Radiography - - - - -	26
3.7 Hydrography - - - - -	26
3.8 Cruise Participants - - - - -	27
4.0 ACKNOWLEDGEMENTS - - - - -	27
APPENDIX A - ROSCOP - - - - -	28

LIST OF FIGURES

	<u>Page</u>
Figure 1. Area of Study and Station Locations with Cruise Track Indicated for MMS California Cruise CAMP 1-2, LEG-1 M/V <u>ALOHA</u> 24 January - 4 February, 1987. - - - - -	2
Figure 2. Site-Specific Array of Stations Around Platform Julius - - - - -	3
Figure 3. Box Core Illustrating "Vegetatic" Partitioning (Top View) and Side View Illustrating Disturbed Subsamples - - - - -	24

LIST OF TABLES

Table 1. Summary of Samples Collected on Cruise CAMP 1-2, LEG-1 of the MMS California Monitoring Program Phase II - - - - -	5
Table 2. Regional Stations Reference Coordinates for the MMS California Monitoring Program Phase II - - - - -	7
Table 3. Primary Site-Specific Stations Reference Coordinates for the MMS California Monitoring Program Phase II - - - - -	8
Table 4. Secondary Site-Specific Stations Reference Coordinates for the MMS California Monitoring Program Phase II - - - - -	9
Table 5. Summary of Sample Positions on Cruise CAMP 1-2, LEG-1 of the MMS California Phase II Monitoring Program (M/V ALOHA) - - - - -	10-22

CRUISE REPORT
For
MMS CRUISE CAMP 1-2
M/V ALOHA
24 January - 3 February, 1987

1.0 INTRODUCTION

Cruise CAMP 1-2 was the second of three cruises scheduled for year one of the MMS California Phase II Monitoring Program (MMS Contract No. 14-12-0001-30262). This program is designed to monitor potential environmental changes at a series of regional stations and at two arrays of site-specific stations near oil production platforms in the western Santa Barbara Channel and Santa Maria Basin region of the California OCS. Platform Hidalgo (Lease P-0450) off Point Arguello was selected for hard-bottom, site-specific monitoring, and Platform Julius (Lease P-0409) off Point Sal was selected for soft-bottom, site-specific monitoring. Specific objectives of the program are:

1. To detect and measure potential long-term (or short-term) changes in the marine environment adjacent to oil and gas platforms; and
2. To determine whether changes observed in the marine environment during the monitoring period are caused by drilling-related activities or are a product of natural processes.

To accomplish these objectives, we are looking closely for potential biological changes and concomitant chemical or physical changes that can be linked to specific drilling events. An overall objective of Cruise CAMP 1-2 is to provide critical pre-drilling baseline data to support these kinds of correlations and inferences.

In January, 1987, modifications to the station design for the Platform Julius study area were made. These modifications were designed to strengthen cross-shelf regional station coverage in the middle portion of our overall study area, and to provide supplemental monitoring data for the Sediment Transport Task, which will involve the deployment of moored instruments in the vicinity of the new regional stations starting in May, 1987.

The modified station design (refer to Figures 1 and 2) eliminated the four primary site-specific stations (PJ-2, PJ-3, PJ-4, and PJ-5) in the northeast, southeast, southwest, and northwest quadrants 1 km from the Platform Julius site center. In lieu of these stations, two new primary site-specific stations were located on the 145m isobath 1 km south and north of PJ-1. These stations are designated PJ-22 (south) and PJ-23. Also, a new regional station R-8 was established on the 91m isobath east of PJ-1, and a new regional station R-9 was established on the 408m isobath west of PJ-1. As a result of these changes, PJ-1, R-8, and R-9 form a new "middle" regional transect, extending in a cross-shelf and slope direction off Pt. Sal.

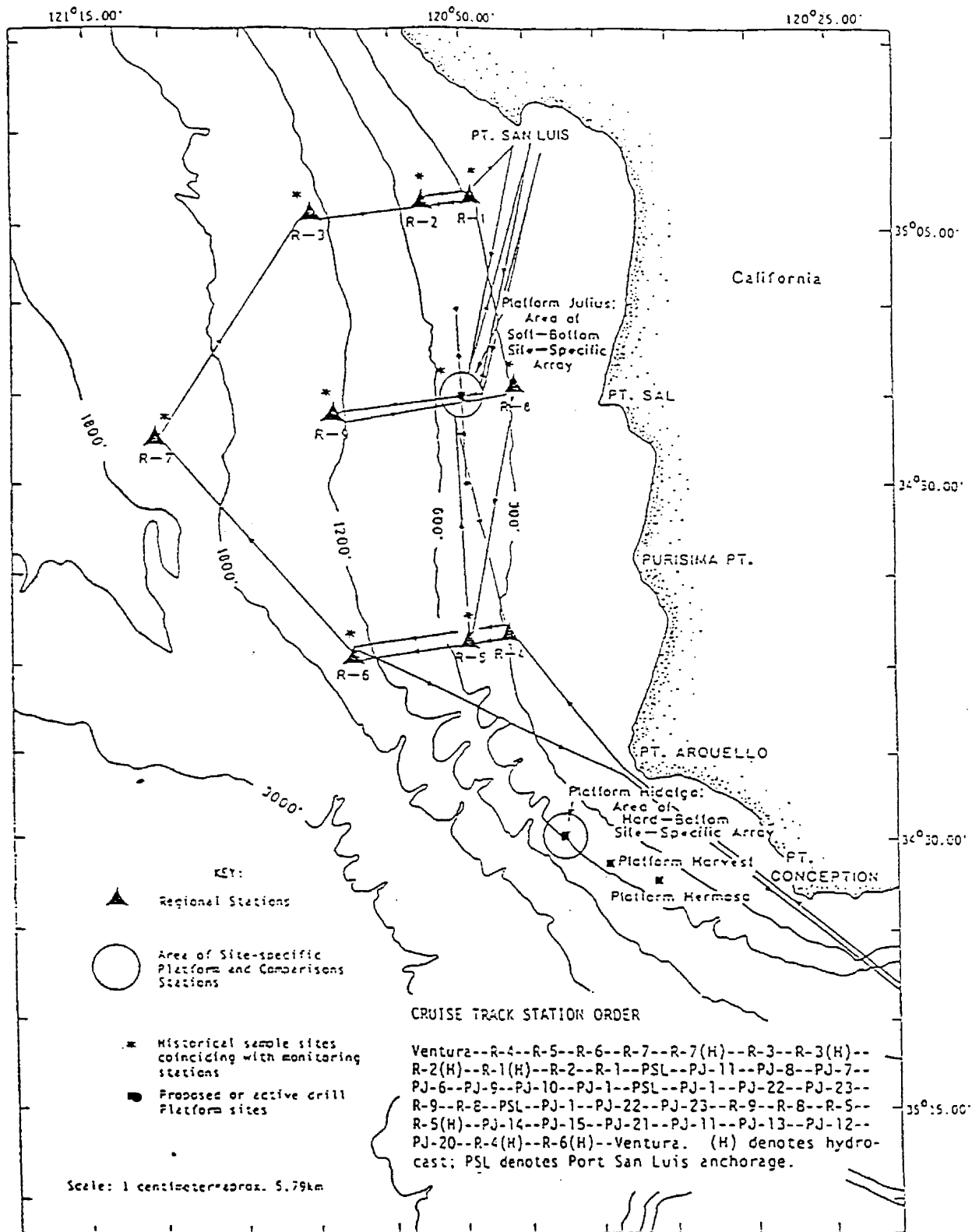
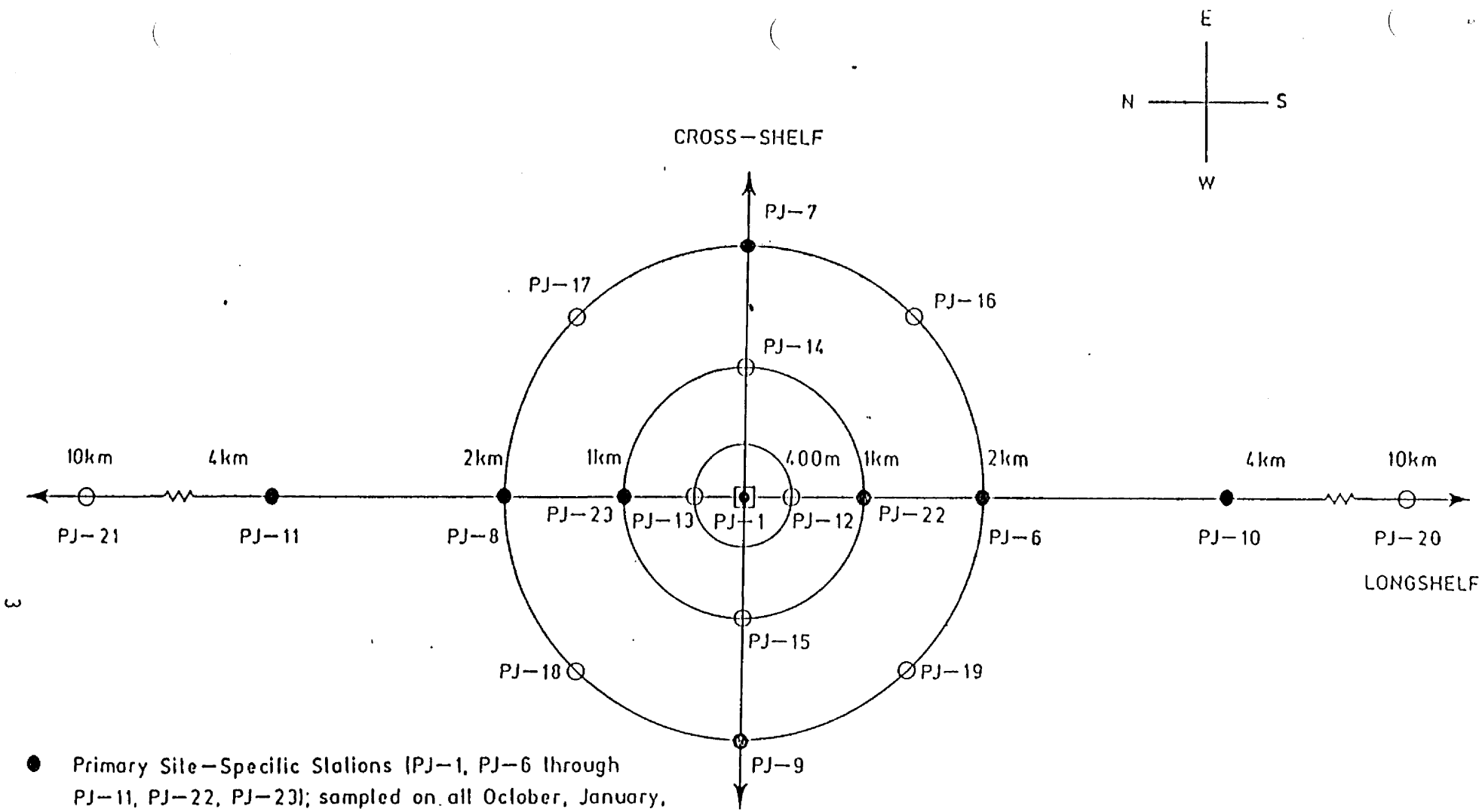


Figure 1. Area of Study and Station Locations with Cruise Track Indicated for MMS California Cruise CAMP 1-2, LEG-1 R/V ALOHA 24 January - 4 February, 1987.



- Primary Site-Specific Stations (PJ-1, PJ-6 through PJ-11, PJ-22, PJ-23); sampled on all October, January, and May monitoring cruises; all samples collected are analyzed; life history analysis also performed on samples collected at Stations PJ-1, PJ-10, and PJ-11.
- Secondary Site-Specific Stations (PJ-12 through PJ-21); sampled on all October, January, and May monitoring cruises; samples collected on October cruises are analyzed — samples collected on January and May cruises are archived.
- ◼ Platform Julius (PJ-1)

Figure 2. Site-Specific Array of Stations Around Platform Julius.

2.0 CRUISE OBJECTIVES

Cruise CAMP 1-2 was the second of three cruises scheduled for year one of the MMS California Phase II Monitoring Program. The cruise was originally scheduled to consist of two legs: soft-bottom boxcoreing (Leg 1) and physical oceanography (Leg 2). The objectives of the soft-bottom leg were to collect three replicate boxcores at nine regional stations and 19 site-specific stations. Each boxcore was to be sampled for benthic infauna (macrofauna and meiofauna), sediment chemistry, and sedimentology parameters. Four primary site-specific stations were to be sampled in triplicate for sediment pore-water chemistry. In addition to box-core sampling, a hydrocast was to be performed at each of the nine regional stations for near-bottom dissolved oxygen, salinity and temperature measurements. Leg 1 was conducted as originally scheduled. However, physical oceanographic work, originally scheduled for Leg 2 on the Aloha, will be conducted in late February on a separate short cruise (of approximately three days duration) using a smaller fishing-size vessel.

3.0 RESULTS

The scheduled departure for the evening of 23 January 1987 was postponed until 24 January due to adverse weather which delayed the return of the M/V Aloha from a previous assignment.

The M/V Aloha, operated by International Underwater Contractors of Ventura, departed Ventura Harbor for Cruise CAMP 1-2, LEG-1 on Sunday, 25 January 1987 at 0006 hours and returned Wednesday, 4 February 1987, at 0100 hours. Weather was variable throughout the cruise, ranging from dead calm and sunny to 30 kt winds, 12 ft swells and rain. Much of the coring was performed during marginal conditions. On January 30 and 31, the weather conditions deteriorated to such an extent that all sampling operations were temporarily suspended. The M/V Aloha anchored at Port San Luis during these suspended sampling periods. A total period of 34 hours of downtime was attributed to poor weather.

In spite of bad weather all samples were collected with the exception of boxcores at four secondary site-specific stations (PJ-16, PJ-17, PJ-18, and PJ-19). Dr. Fred Piltz of the MMS Pacific OCS office instructed us, via radio contact with the Battelle Program Manager, not to spend extra unscheduled cruise time to collect these samples, since: a) the samples were intended to be archived anyway, and b) these four stations were prioritized as being the least strategic among the original group of ten secondary site-specific stations. In addition to these box-core samples, hydrocasts (for bottom measurements of salinity, DO, and temperature) were not performed at regional stations R-8 and R-9. Extra cruise time was not used to obtain these samples, since they are not required contractually and are being collected only on an opportunistic basis to provide supplementary data. Hydrocasts were taken, however, at seven of the nine regional stations. The cruise track and study area are shown in Figures 1 and 2. A summary of all samples collected is given in Table 1.

TABLE 1. SUMMARY OF SAMPLES COLLECTED ON CRUISE CAMP 1-2, LEG-1
of the MMS CALIFORNIA PHASE II MONITORING PROGRAM.

Sample Type	Number of Stations	Number of Replicates/ Station	Total Number Collected on Cruise	Sample Custody
Infaunal Box Core	24	3	72	Battelle (Ventura)
Meiofauna	24	3	72	Univ. Texas
Core Radiography	14	1(x2)(1)	14(x2)	Univ. Maine
Surface Sediment (0-2cm): TM	24	3	72	Battelle (BNW)
Surface Sediment (0-2cm): HC	24	3	72	Battelle (BNE)
Subsurface Sediments (2-10cm): TM	4	3	12	Battelle (BNW)
Subsurface Sediments (2-10cm): HC	4	3	12	Battelle (BNE)
Pore-water Chemistry:TM	4	3	12	Battelle (BNW)
Pore-water Chemistry:HC	4	3	12	Battelle (BNE)
Pb/Th Ratios	7(2)	1	7	Battelle (BNW)
Sedimentology	24	3	72	Kinnetics
Hydrography	7	1	7	Kinnetics

1. One X-ray was taken of each of the two sediment cartridges collected from the 10 x 30-cm subcore.
2. Two extra samples were collected inadvertently; PJ-11 Rep.-2, PJ-8 Rep.-1. These samples will be archived. Remaining five samples will be analyzed as required.

3.1 Navigation

The firm of Land and Seas Surveys, Inc., provided navigational services on the cruise. Station locations established on Cruise CAMP 1-1 were revisited using a Motorola Miniranger system. The Miniranger system was interfaced to a 9826 Hewlett Packard Computer, which was linked to two color monitors (bridge and navigation room) to display the ship's position graphically. A Thinkjet printer and 7475A Hewlett Packard plotter provided hardcopy printouts of Universal Transverse Mercator (UTM) coordinates and station plots. Positions established with the Miniranger system were supported by LORAN time delays.

LORAN time delays were obtained from the Northstar 7000 LORAN C receiver. A navigation software package developed by Mr. Andy Eliason of Eliason Data Services was used to integrate an Apple IIe microcomputer and Epson printer with the LORAN.

The navigation data recorder logged time, date, latitude and longitude, LORAN time delays, samples collected, and general comments. The ship's position was displayed digitally on a monitor, while simultaneously being recorded on disk and printout. The system provided information on the ship's real-time position as well as navigation tracks to and from various waypoints.

All LORAN time delays were in the 9940 GRI (Group Repetition Interval) using the X and Y secondary stations, i.e., the 27-K and 41-K lines, respectively.

All box-core replicates were collected within 20 meters of the established reference coordinates excepting PJ-21. A navigational error discovered subsequent to the cruise has indicated that the three replicates collected at PJ-21 were off station by 300 meters to the east. We do not feel that this error will have any great impact on program results, since samples collected from this station are to be archived. Nonetheless, the cause for this error is being investigated presently to avoid potential problems of a similar nature in the future. All hydrocasts were collected within 50 meters of their respective stations.

The depth parameter was not recorded on each deployment of sampling equipment due to a malfunction in the Edo Western PDR (precision depth recorder). Attempts were made to repair the system throughout the cruise, but proper working order was never attained. This equipment failure also negated our ability to track the boxcore through the water column and to determine the trip phase of the corer. Station depths, however, are established from previous navigational logs.

Time was recorded as Pacific Standard Time (PST).

Station reference coordinates are listed in Tables 2 through 4. Summaries of sample positions are given in Table 5.

TABLE 2. REGIONAL STATIONS REFERENCE COORDINATES FOR THE
MMS CALIFORNIA PHASE II MONITORING PROGRAM.

Station	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)
R-1	35°05.83'N 120°49.16'W	N3885790 E698776	27794.9 42044.9	91
R-2	35°05.50'N 120°53.40'W	N3885047 E692345	27780.8 42057.1	161
R-3	35°05.29'N 121°00.90'W	N3884443 E680956	27756.2 42081.0	409
R-4	34°43.01'N 120°47.38'W	N3843676 E702399	27800.3 41921.5	92
R-5	34°42.69'N 120°50.83'W	N3842964 E697156	27789.8 41932.0	154
R-6	34°41.40'N 120°57.90'W	N3840354 E686413	27768.0 41949.8	407
R-7	34°52.90'N 121°10.30'W	N3861248 E667092	27727.7 42047.7	565
R-8	34°55.29'N 120°45.87'W	N3866433 E704208	27805.6 41978.2	90
R-9	34°53.68'N 120°59.12'W	N3863016 E684098	27763.2 42014.9	408

Revised 2/87

TABLE 3. PRIMARY SITE-SPECIFIC STATIONS REFERENCE COORDINATES
FOR THE MMS CALIFORNIA PHASE II MONITORING PROGRAM

Station	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)
PJ-1	34°55.79'N 120°49.91'W	N3867215 E698032	27792.5 41996.2	145
PJ-6	34°54.71'N 120°49.91'W	N3865215 E698076	27792.5 41989.1	148
PJ-7	34°55.79'N 120°48.60'W	N3867257 E700032	27796.8 41989.9	123
PJ-8	34°56.87'N 120°49.91'W	N3869214 E697989	27792.5 42000.4	152
PJ-9	34°55.79'N 120°51.23'W	N3867171 E696033	27788.2 41999.1	173
PJ-10	34°53.63'N 120°49.91'W	N3863215 E698119	27792.6 41983.4	147
PJ-11	34°57.95'N 120°49.91'W	N3871214 E697946	27792.6 42005.5	136
PJ-22	34°55.25'N 120°49.93'W	N3866217 E698034	27792.5 41991.9	143
PJ-23	34°56.33'N 120°49.90'W	N3868217 E698034	27792.5 41997.3	143

Revised 2/87

TABLE 4. SECONDARY SITE-SPECIFIC STATIONS REFERENCE COORDINATES FOR THE MMS CALIFORNIA PHASE II MONITORING PROGRAM

Station	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)
PJ-12	34°55.58'N 120°49.91'W	N3866815 E698041	27792.6 41993.4	145
PJ-13	34°56.01'N 120°49.91'W	N3867615 E698024	27792.5 41995.6	144
PJ-14	34°55.79'N 120°49.26'W	N3867235 E699032	27794.8 41992.3	134
PJ-15	34°55.79'N 120°50.57'W	N3867192 E697033	27790.5 41996.7	155
PJ-16	34°55.03'N 120°48.99'W	N3865830 E699477	27795.5 41987.7	130
PJ-17	34°56.56'N 120°48.98'W	N3868659 E699416	27795.6 41995.4	126
PJ-18	34°56.56'N 120°50.84'W	N3868597 E696589	27789.5 42001.6	158
PJ-19	34°55.03'N 120°50.84'W	N3865770 E696650	27789.6 41993.8	167
PJ-20	34°50.38'N 120°49.91'W	N3857216 E698249	27792.5 41966.8	148
PJ-21	34°01.23'N 120°51.15'W	N3877228 E695936	27788.3 42027.2	143

Revised 2/87

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
R-1	Reference Coordinates		35°05.83'N 120°49.16'W	N3885790 E698776	27794.9 42044.9	91	
R-1	28 Jan 87 0833	Box Core 1	35°05.83'N ^p 120°49.16'W	N3885793 E698773	27795.0 42044.6	91	First attempt no-trip. Sediment soft, hardpacked. Sloped surfaces PDR-malfunction.
R-1	28 Jan 87 1013	Box Core 2	35°05.83'N ^p 120°49.16'W	N3885792 E698771	27795.0 42044.6	91	Good surfaces.
R-1	28 Jan 87 1156	Box Core 3	35°05.82'N [←] 120°49.16'W	N3885778 E698772	27795.0 42044.6	91	Excellent surfaces, 15-cm penetration. SLO to exchange MMS observers.
R-1	28 Jan 87 0214	Hydrocast ⁴	35°05.79'N ^p 120°49.12'W	N3885723 E698831	27795.1 42044.3	91	
R-2	Reference Coordinates		35°05.50'N 120°53.40'W	N3885047 E692345	27780.8 42057.1	161	
R-2	28 Jan 87 0309	Box Core 1	35°05.50'N ^e 120°53.40'W	N3885050 E692344	27780.7 42057.1	161	Fine silt, soft green mud. Penetration to 25cm.
R-2	28 Jan 87 0435	Box Core 2	35°05.49'N ^e 120°53.40'W	N3885038 E692342	27780.7 42057.0	161	Penetration to 25cm.
R-2	28 Jan 87 0526	Box Core 3	35°05.49'N 120°53.39'W ^t	N3885043 E692358	27780.8 42057.1	161	
R-2	28 Jan 87 0132	Hydrocast	35°05.50'N 120°53.38'W ^t	N3885051 E692383	27780.8 42057.0	161	

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
R-3		Reference Coordinates	35°05.29'N 121°00.90'W	N3884443 E680956	27756.2 42081.0	409	
R-3	27 Jan 87 1910	Box Core 1	35°05.30'N 121°00.89'W	N3884445 E680968	27756.2 42081.1	409	Extremely soft green mud. Pins must be left in corer with pre-trip bar uncocked at this station.
R-3	27 Jan 87 2052	Box Core 2	35°05.30'N 121°00.90'W	N3884443 E680952	27756.3 42081.3	409	Soft green mud, high water content. High pullout tension.
R-3	27 Jan 87 2246	Box Core 3	35°05.29'N 121°00.91'W	N3884432 E680939	27756.2 42081.2	409	Excellent samples. PDR-malfunction.
R-3	28 Jan 87 0006	Hydrocast 4	35°05.30'N 121°00.90'W	N3884455 E680956	27756.1 42081.2	409	Wind, seas, and rain increasing.
R-4		Reference Coordinates	34°43.01'N 120°47.38'W	N3843676 E702399	27800.3 41921.5	92	
R-4	25 Jan 87 1702	Box Core 1	34°43.01'N 120°47.40'W	N3843678 E702376	27800.4 41921.0	92	First attempt unacceptable due to oil sheen on surface. Good penetration, much detritus.
R-4	25 Jan 87 2000	Box Core 2	34°43.01'N 120°47.38'W	N3843673 E702407	27801.4 41918.8	92	Excellent surfaces on cores, undisturbed.
R-4	25 Jan 87 2230	Box Core 3	34°43.01'N 120°47.39'W	N3843676 E702397	27800.3 41921.5	92	Soft mud overlying compact lower layers. High concentration of organisms. Pt. San Luis till a.m.
R-4	03 Feb 87 1325	Hydrocast 4	34°43.01'N 120°47.39'W	N3843676 E702401	27800.3 41921.4	92	

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
R-5		Reference Coordinates	34°42.69'N 120°50.83'W	N3842964 E697156	27789.8 41932.0	154	
R-5	26 Jan 87 1547	Box Core 1	34°42.69'N 120°50.83'W	N3842964 E697151	27789.8 41932.0	154	Several attempts since 0800 were un-acceptable due to wash-outs - location problem discovered.
R-5	02 Feb 87 0750	Box Core 2	34°42.69'N 120°50.83'W	N3842970 E697158	27789.7 41932.1	154	Variable penetration due to scallop shells (7-15cm).Some alternates used.
R-5	02 Feb 87 0952	Box Core 3	34°42.69'N 120°50.82'W	N3842972 E697162	27789.9 41931.9	154	No shells at base of sample - unusual.
R-5	02 Feb 87 1129	Hydrocast	34°42.69'N 120°50.83'W	N3842960 E697155	27789.7 41932.0	160	
R-6		Reference Coordinates	34°41.40'N 120°57.90'W	N3840354 E686413	27768.0 41949.8	407	
R-6	26 Jan 87 2056	Box Core 1	34°41.39'N 120°57.90'W	N3840347 E686404	27768.0 41949.8	407	Penetration to 13cm. Sediment dense and dry.
R-6	27 Jan 87 0152	Box Core 2	34°41.40'N 120°57.89'W	N3840357 E686421	27768.0 41949.9	407	Four previous attempts - washouts. Compact base sediment.
R-6	27 Jan 87 0334	Box Core 3	34°41.40'N 120°57.90'W	N3840358 E686416	27768.0 41949.9	407	Deeper penetration than reps 1 and 2, 15cm.
R-6	03 Feb 87 1454	Hydrocast	34°41.40'N 120°57.90'W	N3840351 E686411	27768.0 41949.8	407	The last sample, making way for Ventura Harbor.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHIA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
R-7	Reference Coordinates		34°52.90'N 121°10.30'W	N3861248 E667092	27727.7 42047.7	565	
R-7	27 Jan 87 0951	Box Core 1	34°52.89'N ← 121°10.30'W	N3861242 E667092	27727.8 42047.7	565	Three previous attempts n.g. Extremely soft mud, must leave corerpins in place and release pre-trip bar..
R-7	27 Jan 87 1158	Box Core 2	34°52.90'N ← 121°10.30'W	N3861255 E667089	27727.7 42047.8	565	Penetration > 30cm.
R-7	27 Jan 87 1342	Box Core 3	34°52.90'N ← 121°10.30'W	N3861252 E667095	27727.7 42047.8	565	Extremely soft green mud.
R-7	27 Jan 87 1631	Hydrocast	34°52.99'N ← 121°10.36'W	N3861415 E666999	27727.5 42048.3	565	
R-8	Reference Coordinates		34°55.29'N 120°45.87'W	N3866433 E704208	27805.8 41978.3	90	Established via bathymetric survey on CAMP 1-2.
R-8	02 Feb 87 0227	Box Core 1	34°55.29'N 120°45.86'W [†]	N3866430 E704215	27805.6 41978.2	90	Penetration to 15cm. Meiofauna taken from alternate core. Some wash-out.
R-8	02 Feb 87 0336	Box Core 2	34°55.29'N 120°45.87'W ^e	N3866432 E704201	27805.6 41978.3	90	
R-8	02 Feb 87 0440	Box Core 3	34°55.29'N ^e 120°45.87'W	N3866428 E704200	27805.5 41978.3	90	

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
R-9	Reference Coordinates		34°53.68'N 120°59.12'W	N3863016 E684098	27763.2 42014.9	408	Established via bathymetric survey on CAMP 1-2.
R-9	01 Feb 87 2130	Box Core 1	34°53.68'N 120°59.12'W	N3863013 E684098	27763.2 42014.9	408	Penetration > 20cm, very soft green mud.
R-9	01 Feb 87 2256	Box Core 2	34°53.68'N 120°59.12'W	N3863019 E684096	27763.2 42015.0	408	Penetration > 30cm. Greater than 10-cm fraction, denser than rep.1.
R-9	01 Feb 87 2334	Box Core 3	34°53.67'N 120°59.12'W	N3862997 E684102	27763.1 42014.8	408	Undisturbed surfaces. Penetration > 25cm.
14 PJ-1	Reference Coordinates		34°55.79'N 120°49.91'W	N3867215 E698032	27792.5 41996.2	145	
PJ-1	01 Feb 87 0830	Box Core 1	34°55.80'N 120°49.91'W	N3867230 E698031	27792.4 41994.7	145	Two previous attempts aborted due to bad weather-34 hrs.downtime. 30-31 Jan. at SLO. Excellent surfaces.
PJ-1	01 Feb 87 0909	Box Core 2	34°55.79'N 120°49.92'W	N3867219 E698029	27792.5 41994.7	145	Slightly disturbed surfaces. 12 ft swells, 20 kt winds.
PJ-1	01 Feb 87 1050	Box Core 3	34°55.79'N 120°49.91'W	N3867213 E698036	27792.5 41994.5	145	Two previous attempts n.g.
PJ-1	01 Feb 87 1122	Pore Water Box Core 1	34°55.79'N 120°49.91'W	N3867214 E698031	27792.5 41994.6	145	One quadrant unacceptable, sloped surface.
PJ-1	01 Feb 87 1152	Pore Water Box Core 2	34°55.79'N 120°49.91'W	N3867208 E698035	27792.5 41994.6	145	Excellent sample.
PJ-1	01 Feb 87 1236	Pore Water Box Core 3	34°55.79'N 120°49.92'W	N3867207 E698023	27792.5 41994.6	145	Excellent sample. Wind and seas building.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-6		Reference Coordinates	34°54.71'N 120°49.91'W	N3865215 E698076	27792.5 41989.1	148	
PJ-6	29 Jan 87 2018	Box Core 1	34°54.71'N 120°49.91'W	N3865214 E698084	27792.6 41989.2	148	Two previous attempts, no trip and water trip. Penetration > 25cm.
PJ-6	29 Jan 87 2214	Box Core 2	34°54.71'N 120°49.91'W	N3865216 E698077	27792.5 41989.1	148	Hydraulic generator down temporarily.
PJ-6	29 Jan 87 2330	Box Core 3	34°54.71'N 120°49.91'W	N3865210 E698077	22792.5 41989.2	148	Fine silt, good surfaces.
PJ-7		Reference Coordinates	34°55.79'N 120°48.60'W	N3867257 E700032	27796.8 41989.9	123	
PJ-7	29 Jan 87 1557	Box Core 1	34°55.79'N 120°48.60'W	N3867255 E700031	27796.7 41990.2	123	Uneven surfaces, back row of biology slightly washed.
PJ-7	29 Jan 87 1714	Box Core 2	34°55.79'N 120°48.59'W	N3867253 E700041	27796.7 41990.2	123	Penetration - 15cm. Undisturbed surfaces.
PJ-7	29 Jan 87 1837	Box Core 3	34°55.79'N 120°48.59'W	N3867259 E700045	27796.7 41990.1	123	

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-8		Reference Coordinates	34°56.87'N 120°49.91'W	N3869214 E697989	27792.5 42000.4	152	
PJ-8	29 Jan 87 0513	Box Core 1	34°56.87'N ^c 120°49.90'W	N3869202 E698006	27792.6 42000.2	152	Second pennant cable changed prior to station. Two no trips.
PJ-8	29 Jan 87 0834	Box Core 2	34°56.88'N ^e 120°49.92'W	N3869222 E697984	27792.5 42000.2	152	PDR still down after repairing wire cuts.
PJ-8	29 Jan 87 1038	Box Core 3	34°56.87'N ^e 120°49.91'W	N3869212 E697995	27792.5 42000.2	152	Soft upper, medium lower layers. Many Ophiuroids.
¹⁶ PJ-8	29 Jan 87 1253	Pore Water Box Core 1	34°56.87'N ^c 120°49.91'W	N3869212 E697992	27792.4 42000.3	152	Two previous attempts n.g.: poor sample and no trip.
PJ-8	29 Jan 87 1328	Pore Water Box Core 2	34°56.87'N ^c 120°49.91'W	N3869208 E697994	27792.5 42000.3	152	Front quadrants slightly washed. Third pennant cable damaged.
PJ-8	29 Jan 87 1442	Pore Water Box Core 3	34°56.87'N ^e 120°49.91'W	N3869212 E697994	27792.4 42000.3	152	Excellent sample.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-9		Reference Coordinates	34°55.79'N 120°51.23'W	N3867171 E696033	27788.2 41999.1	173	
PJ-9	30 Jan 87 0040	Box Core 1	34°55.79'N 120°51.23'W	N3867173 E696020	27788.2 41999.4	173	Penetration - 20cm. Soft upper layer, medium dense lower layers.
PJ-9	30 Jan 87 0200	Box Core 2	34°55.79'N 120°51.22'W	N3867176 E696043	27788.2 41999.2	173	Undisturbed surfaces.
PJ-9	30 Jan 87 0310	Box Core 3	34°55.79'N 120°51.23'W	N3867176 E696029	27788.2 41999.3	173	Penetration - 20cm.
Δ PJ-10		Reference Coordinates	34°53.63'N 120°49.91'W	N3863215 E698119	27792.6 41983.4	147	
PJ-10	30 Jan 87 0439	Box Core 1	34°53.63'N 120°49.91'W	N3863213 E698126	27792.4 41983.6	147	Excellent surfaces. Seas and wind rising.
PJ-10	30 Jan 87 0538	Box Core 2	34°53.63'N 120°49.92'W	N3863209 E698109	27792.5 41983.7	147	Soft upper layers. Very dense base. Raining.
PJ-10	30 Jan 87 0731	Box Core 3	34°53.63'N 120°49.92'W	N3863209 E698108	27792.5 41983.6	147	Heavy rain. Seas 2 ft. Swells 4 ft.
PJ-10	30 Jan 87 0942	Pore Water Box Core 1	34°53.63'N 120°49.91'W	N3863216 E698125	27792.5 41983.5	147	Good sample. Undisturbed.
PJ-10	30 Jan 87 1232	Pore Water Box Core 2	34°53.63'N 120°49.91'W	N3863218 E698119	27792.5 41983.6	147	Pennant cable slightly damaged. Main wire re-terminated.
PJ-10	30 Jan 87 1308	Pore Water Box Core 3	34°53.63'N 120°49.91'W	N3863211 E698122	27792.5 41983.5	147	Wind and seas approaching marginal conditions. 30 Jan.1530-heading to SLO-weather/drop off Dr. Gillard.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-11	Reference Coordinates		34°57.95'N 120°49.91'W	N3871214 E697946	27792.6 42005.5	136	
PJ-11	28 Jan 87 1809	Box Core 1	34°57.95'N 120°49.91'W	N3871199 E697953	27792.5 42005.8	136	Wind 25 kts. Seas building, cold front approaching.
PJ-11	28 Jan 87 2027	Box Core 2	34°57.95'N 120°49.92'W	N3871206 E697943	27792.7 42005.3	136	Rough seas, good recovery. Penetration >30cm. Soft-dense.
PJ-11	28 Jan 87 2346	Box Core 3	34°57.95'N 120°49.92'W	N3871196 E697931	27792.5 42005.8	136	Marginal sampling conditions. Dense >10-cm fraction, clayballs.
18 PJ-11	28 Jan 87 1722	Pore Water Box Core 1	34°57.95'N 120°49.92'W	N3871203 E697939	27792.5 42005.8	136	Surfaces disturbed but acceptable.
PJ-11	28 Jan 87 2251	Pore Water Box Core 2	34°57.95'N 120°49.91'W	N3871213 E697958	27792.5 42005.6	136	Excellent surfaces, weather deteriorating.
PJ-11	03 Feb 87 0034	Pore Water Box Core 3	34°57.96'N 120°49.91'W	N3871223 E697949	27792.4 42005.8	136	Two quadrants washed, remaining two sections had good surfaces.
PJ-12	Reference Coordinates		34°55.57'N 120°49.91'W	N3866815 E698041	27792.6 41993.4	145	
PJ-12	03 Feb 87 0408	Box Core 1	34°55.58'N 120°49.91'W	N3866817 E698044	27792.4 41993.5	145	Penetration to 30cm.
PJ-12	03 Feb 87 0457	Box Core 2	34°55.57'N 120°49.91'W	N3866813 E698040	27792.4 41993.4	145	Sediment type varied from front to back of box.
PJ-12	03 Feb 87 0554	Box Core 3	34°55.58'N 120°49.91'W	N3866821 E698050	27792.4 41993.4	145	First attempt, no trip. Variable sediment in core.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-13		Reference Coordinates	34°56.01'N 120°49.91'W	N3867615 E698024	27792.5 41995.6	144	
PJ-13	03 Feb 87 0109	Box Core 1	34°56.01'N 120°49.91'W	N3867612 E698025	27792.4 41995.7	144	Penetration to 30cm, some surface disturbance.
PJ-13	03 Feb 87 0203	Box Core 2	34°56.01'N 120°49.92'W	N3867611 E698020	27792.4 41995.6	144	Penetration to 30cm. Very soft sediments.
PJ-13	03 Feb 87 0302	Box Core 3	34°56.01'N 120°49.91'W	N3867614 E698026	22792.4 41995.4	144	Surfaces uneven, undisturbed.
19 PJ-14		Reference Coordinates	34°55.79'N 120°49.26'W	N3867235 E699032	27794.8 41992.3	134	
PJ-14	02 Feb 87 1332	Box Core 1	34°55.79'N 120°49.26'W	N3867230 E699027	27794.7 41992.2	134	Penetration to 25cm.
PJ-14	02 Feb 87 1448	Box Core 2	34°55.79'N 120°49.25'W	N3867243 E699044	27794.6 41992.4	134	Penetration to 25cm. Heavy cloud cover.
PJ-14	02 Feb 87 1559	Box Core 3	34°55.79'N 120°49.25'W	N3867238 E699044	27794.6 41992.3	134	Some surfaces sloped.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-15	Reference Coordinates		34°55.79'N 120°50.57'W	N3867192 E697033	27790.5 41996.7	155	
PJ-15	02 Feb 87 1701	Box Core 1	34°55.79'N 120°50.57'W	N3867189 E697030	27790.4 41996.8	155	Penetration to 25cm. Some surfaces sloped.
PJ-15	02 Feb 87 1802	Box Core 2	34°55.79'N 120°50.57'W	N3867192 E697031	27790.4 41996.8	155	Penetration to 30cm. Good surfaces.
PJ-15	02 Feb 87 1913	Box Core 3	34°55.79'N 120°50.57'W	N3867195 E697028	27790.3 41996.8	155	Some surfaces sloped. Numerous Heart urchins.
28 PJ-20	Reference Coordinates		34°50.38'N 120°49.91'W	N3857216 E698249	27792.5 41966.8	148	
PJ-20	03 Feb 87 0756	Box Core 1	34°50.37'N 120°49.91'W	N3857199 E698248	27792.5 41966.9	148	Good penetration, some sloped surfaces.
PJ-20	03 Feb 87 1010	Box Core 2	34°50.38'N 120°49.91'W	N3857213 E698248	27792.5 41966.9	148	Very sandy sediment. Shallow penetration. Alternate used cores.
PJ-20	03 Feb 87 1038	Box Core 3	34°50.37'N 120°49.91'W	N3857202 E698252	27792.5 41966.9	148	Back row of biology cores washed. Alternate cores used for biology, Chemistry and sedimentology.

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-21		Reference Coordinates	35°01.23'N 120°51.15'W	N3877228 E695936	27788.3 42027.2		
PJ-21	02 Feb 87 2035	Box Core 1	35°01.24'N 120°51.34'W	N3877237 E695638	27787.6 42027.8		Penetration to 30cm.
PJ-21	02 Feb 87 2149	Box Core 2	35°01.24'N 120°51.34'W	N3877238 E695641	27787.6 42027.9		Lower fraction (>10cm) dense clay.
PJ-21	02 Feb 87 2303	Box Core 3	35°01.23'N 120°51.34'W	N3877229 E295642	27787.7 42027.9		Undisturbed surfaces. Replicates 1, 2, and 3 off station by 300m to the east.
21 PJ-22		Reference Coordinates	34°55.25'N 120°49.93'W	N3866217 E698034	27792.5 41991.9	143	Established via range and bearing from PJ-1 during CAMP 1-2.
PJ-22	01 Feb 87 1318	Box Core 1	34°55.25'N 120°49.93'W	N3866222 E698036	27792.5 41991.8	143	Penetration to 17cm. Surfaces sloped.
PJ-22	01 Feb 87 1411	Box Core 2	34°55.25'N 120°49.93'W	N3866219 E698021	27792.4 41991.6	143	Undisturbed surfaces. Sediment less dense than replicate 1.
PJ-22	01 Feb 87 1511	Box Core 3	34°55.25'N 120°49.92'W	N3866221 E698048	27792.5 41991.9	143	

TABLE 5. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 1-2, LEG-1
OF THE MMS CALIFORNIA PHASE II MONITORING PROGRAM (M/V ALOHA) (Continued)

Station	Date and Time (PST)	Sample	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)	Comments
PJ-23	Reference Coordinates		34°56.33'N 120°49.90'W	N3868217 E698034	27792.5 41997.3	143	Established via range and bearing from PJ-1 during CAMP 1-2.
PJ-23	01 Feb 87 1607	Box Core 1	34°56.33'N 120°49.90'W	N3868218 E698031	27792.5 41997.3	143	Hard packed sediment below 12cm.
PJ-23	01 Feb 87 1807	Box Core 2	34°56.33'N 120°49.90'W	N3868212 E698036	27792.6 41997.3	143	Penetration to 25cm.
PJ-23	01 Feb 87 1933	Box Core 3	34°56.33'N 120°49.90'W	N3868213 E698033	27792.5 41997.3	143	

3.2 Box-Core Sampling

A Hessler-Sandia MK-III 0.25m² box core, vegetatively partitioned into 25 individual 0.01-m² subcores, was used to collect sediment samples (Figure 3). Three replicate cores were collected at each of the nine regional stations (R-1 through R-9) and 15 of the 19 site-specific stations (PJ-1, PJ-6 through PJ-15, and PJ-20 through PJ-23) for benthic infauna (macrofauna and meiofauna), chemistry, and sedimentology parameters. At each of four stations (PJ-1, PJ-8, PJ-10, and PJ-11), three additional box core replicates were collected for the purpose of sediment pore-water chemistry analysis, using a quadrilateral 0.25-m² box.

An unusually high number of box-core "no trips" and "wash-outs" were encountered due to marginal weather conditions. Three box-core pennant cables were severely damaged and required replacement. The combined factors of ship's wire, swivel, pennant-cable core, and weather may have attributed to the pennant cable damage. Measures will be taken to solve this problem prior to the next cruise, since a parting of the pennant cable would result in the loss of the box core.

Another significant hinderance encountered during the cruise was the great difficulty in collecting box cores at station R-5. Upon arrival at R-5, repeated attempts were made to collect a sample. However, due to the density of fossilized scallop shells at the 10-cm depth, these attempts resulted in wash-outs and unacceptable samples. During these attempts it was realized that on Cruise CAMP 1-1, Leg-2, the actual station position had been moved 100 meters to the north to an area where scallop shells were present in lower densities. Our position was corrected after one sample was collected at the original location. This sample was retained (only for the purpose of archiving) and three replicates were collected at the revised station location.

Five gallons of mud (0-10cm) was retained from undesignated sections of the box cores collected at station PJ-1 (replicates 1 and 2). This mud was refrigerated and will be sent to Dr. Brad Butman at U.S.G.S. for use in the Sediment Transport/Bioturbation Task.

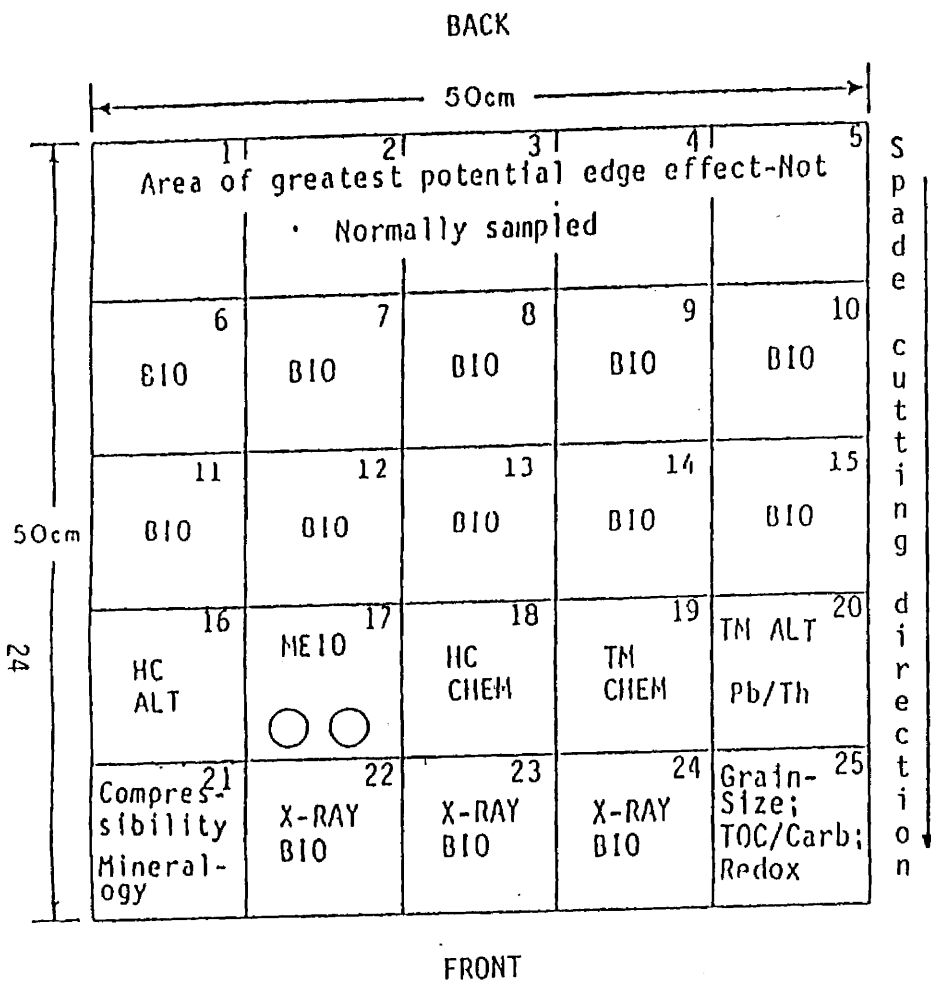
A total of 84 box cores were collected on Cruise CAMP 1-2.

3.3 Biology

From each of three replicate box cores collected at each of the nine regional stations (R-1 through R-9) and 15 site-specific stations (PJ-1, PJ-6 through PJ-15, and PJ-20 through PJ-23), ten subcores (Subcore Numbers 6-15) were taken for benthic macroinfauna, and one subcore (Subcore Number 17) was used to take a single 1-cm diameter sample for meiofauna.

Macrofaunal samples were processed on board ship in the following manner. The subcores were removed individually from the box and the upper 10cm of sediment was extruded, cut, and placed in an elutriating bucket. The remaining portion of the subcore (>10cm) also was extruded and placed in an elutriating bucket. Three to four subcores were extruded and placed in one elutriating bucket. The 0 to 10cm upper-core fraction was processed with filtered seawater through a 0.3-mm mesh sieve, and the >10-cm lower-core

TOP VIEW



SIDE VIEW

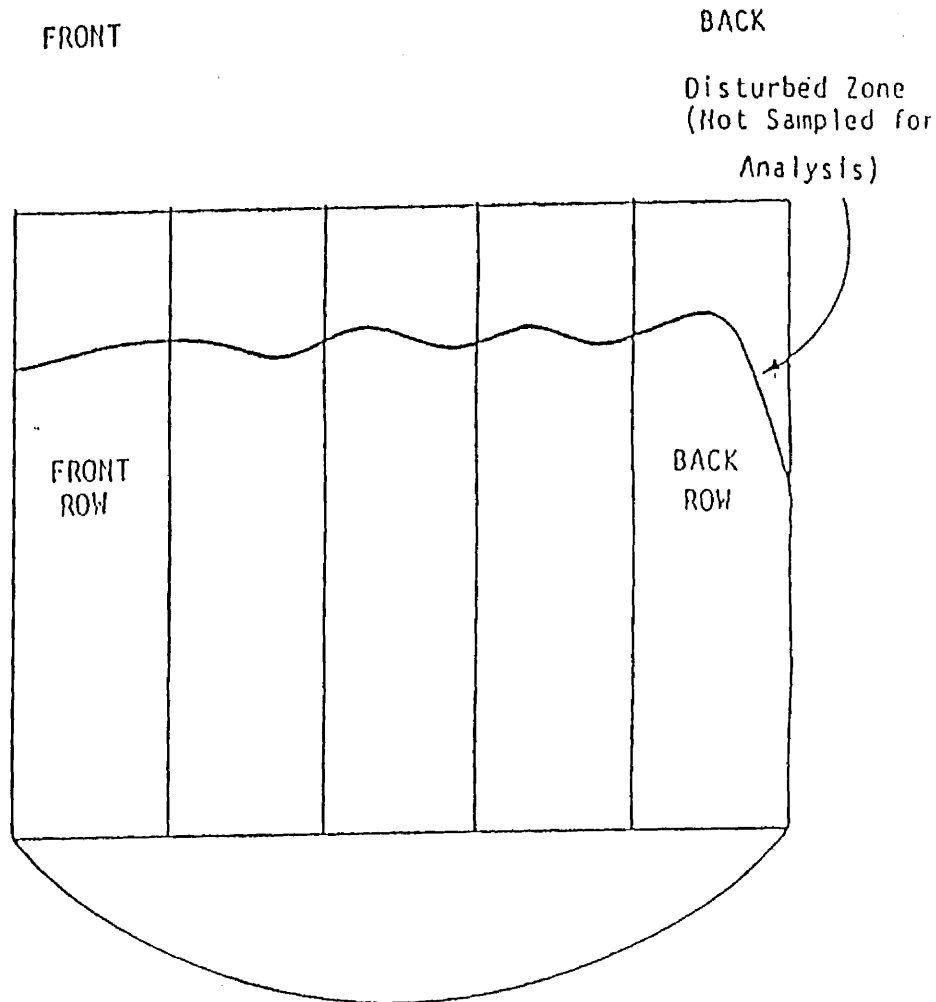


Figure 3. Box core illustrating "vegetative" partitioning (top view) and side view illustrating disturbed subsamples.

fraction was processed with filtered seawater through a 1.0-mm mesh sieve. The residue from both fractions was rinsed into separate 16-oz glass jars and preserved with approximately 10-percent buffered formalin.

Meiofauna samples were extruded from the core tubes and relaxed for 5 minutes in MgCl, followed by preservation in 5-percent formalin and storage in 60-ml plastic tubes. In some instances, alternate cores were utilized to replace cores which were washed-out or disturbed.

3.4 Chemistry

From each of the three replicate box cores at each of the 24 stations (regionals and site-specifics) a 0 to 2-cm Trace Metal (TM) chemistry sample was collected from a Teflon-coated subcore (Subcore No. 19) and a 0 to 2-cm Hydrocarbon Chemistry (HC) sample was collected from a solvent-rinsed subcore (Subcore No. 18).

At four site-specific stations (PJ-1, PJ-8, PJ-10, and PJ-11), the upper 10cm of Subcores No. 19 and No. 18 were collected for TM and HC, respectively. These cores were divided vertically into 0-2-cm and 2-10-cm sections. The lower-core sections will be analyzed subsequently to investigate the vertical extent of TM and HC penetration. At four site-specific stations (the same stations designated for 0 to 10-cm sediment chemistry cores; i.e., PJ-1, PJ-8, PJ-10, and PJ-11), three additional box-core replicates were collected for pore-water chemistry analysis using a quadrilateral 0.25-m² box. The entire 0 to 2-cm surface area was collected from these box cores and processed; the filtrate was preserved and stored for subsequent laboratory analysis. Care was exercised during sampling to avoid the sides of the box to prevent potential sample contamination. The quadrilateral box arrangement was successful in that it reduced sample surface disturbance.

At two regional stations (R-8 and R-9) and three site-specific stations (PJ-1, PJ-10, and PJ-11), one subcore (Subcore No. 20) was taken from one of the replicate box cores for the analysis of Lead and Thorium isotope ratios. The Pb/Th ratio sample was collected by inserting an acid-washed CAB core liner into the subcore and capping both ends. The sample was frozen subsequently. Two extra samples were collected inadvertently: PJ-11 (Rep. 2) and PJ-8 (Rep. 1). These samples will be archived.

Several quality assurance samples and blanks were collected for chemistry analyses. These samples which will be analyzed to detect any background contamination, are as follows::

1. Ship's hydraulic fluid samples for hydrocarbons
2. Air exposure sample for hydrocarbons
3. Milli-Q water from chemistry carboy for trace metals and hydrocarbons
4. Two Milli-Q water samples filtered through pore-water apparatus for trace metals and hydrocarbons.

3.5 Sedimentology

Samples were collected from each of the three replicate box cores at each of the 24 stations in the Platform Julius study area for the determination of sediment properties. Measurements and samples for TOC, carbonate, grain-size, and REDOX were taken from Subcore No. 25. At all stations, sediment compressibility measurements and mineralogy samples were taken from Subcore No. 21. Only mineralogy samples collected at 10 stations (R-1 through R-7; and PJ-1, PJ-10, and PJ-11) will be analyzed. All other mineralogy samples are to be archived.

3.6 Core Radiography

At 14 stations (R-1 through R-9; and PJ-1, PJ-10, PJ-11, PJ-22, and PJ-23) a specially designed 10 x 30-cm subcore (in place of Subcores No. 22, 23, and 24) was removed from one of the boxcore replicates for x-ray analysis (for evidence of bioturbation). Two plastic cartridges were inserted into the subcore and the surrounding mud was washed away. Immediately following collection, the x-raying took place in the ship's laboratory and the photos were developed in the darkroom. The x-ray photos were repeated when the first attempt was unsuccessful. The mud cartridges were dismantled and notes were taken as to the sample appearance.

3.7 Hydrography

A single Niskin bottle equipped with two deep-sea reversing thermometers (DSRT) was deployed at seven of the regional stations (R-1 through R-7), to collect samples for the determination of near-bottom dissolved oxygen, salinity, and temperature. Dissolved oxygen was measured in triplicate on board using the Winkler titrimetric method. Salinity samples were measured using a Hanna H-18333 conductivity probe. Temperature was recorded from the thermometers.

To insure the collection of a near-bottom water sample, a 200 lb weight and a 12 kHz pinger were attached to the hydrowire. Once the PDR malfunction arose, it negated using the pinger.

3.8 Cruise Participants

Participants on Cruise CAMP 1-2, Leg 1 and their affiliations are:

Battelle

James Campbell, Chief Scientist
Janet Kennedy, Second Scientist
Jeff Waugh, Chemist
Russell Winchell
Patrick Hart

Kinnetic Laboratories, Inc.

Scott Carter
Sharon Hamer
Jennifer Pelkan
Jay Shrake
Richard Mattison

Land and Sea Surveys, Inc.

Robert Dellaert
James Cooley

4.0 ACKNOWLEDGEMENTS

The Chief Scientist and Second Scientist wish to thank the scientific personnel for their outstanding dedication and hard work which resulted in a safe and successful cruise, in spite of poor weather conditions occurring off and on throughout the cruise. Special thanks is given to the crew of I.U.C.'s M/V Aloha for their skillful deck operations and ship handling.

APPENDIX A

REPORT OF OBSERVATIONS/SAMPLES COLLECTED BY
OCEANOGRAPHIC PROGRAMS (ROSCOP)

NOAA FORM 24-23
(1-76)

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEANOGRAPHIC DATA CENTER

A00 DATA CENTER

OCEANOGRAPHY - GENERAL CRUISE INVENTORY
(ROSCOP - II)

A40 REFERENCE NUMBER

A01 EXPEDITION/PROJECT California OCS Phase II Monitoring Program		YES	NO	PART	
A11 CRUISE NUMBER OR NAME CAMP 1-2, LEG 1		A91 Declared national program?		X	
A02 SHIP OR PLATFORM R/V ALOHA HO-8579		A81 Exchange restricted?			X
A12 PLATFORM TYPE 01		A92 Co-operative program?			X
A03 COUNTRY USA		A04 ORGANIZATION Battelle/Kinnetics		A05 CHIEF SCIENTIST(S) James F. Campbell	
A06 NAME AND ADDRESSES OF ORGANIZATIONS AND PERSONS WHOM TO QUERY		FINAL DISPOSITION OF DATA			

A1 J. L. Hyland, Battelle, Ventura, CA	A2 J. L. Hyland
B1 P. D. Boehm, Battelle, Duxbury, MA	B2 Program Manager
C1 E. Crecilius, Battelle, Sequim, WA	C2 Battelle
D1 P. Kinney, Kinnetics, Santa Cruz, CA	D2 1431 Spinnaker Drive
E1 L. Watling, Univ. of Maine, Walpole, ME	E2 Ventura, CA 93001

DATE	DAY	MONTH	YEAR	A08 GENERAL OCEAN AREAS	
A07 FROM	2	5	01	87	57A N E Pacific 121°W
A17 TO	0	3	02	87	A09 TYPE(S) OF MARINE ZONE(S) 07.08

GEOGRAPHIC AREA		A10 LATITUDE	A20 LONGITUDE
<i>If all data were collected at a fixed station, fill in the co-ordinates</i>		" N/S	" E/W

A15 FEDERAL SUPPORT U. S. D. I. Minerals Management Service

A25 REMARKS

DISCIPLINE AND TYPE OF MEASUREMENTS	Index 10° x 10°				INDEX 1° x 1°	DISCIPLINE AND TYPE OF MEASUREMENTS	Index 10° x 10°				INDEX 1° x 1°
	Qc	L	G	G			Qc	L	G	G	
GS, H(NSF), HC, A P, B, BS	B	7	3	1	2	A	B				
A B						A	B				
A B						A	B				
A B						A	B				
A B						A	B				
A B						A	B				
A B						A	B				

H - HYDROGRAPHY											
HS SURFACE		NUMBER	i	I	FORMAT	HC CHEMICAL		NUMBER	i	I	FORMAT
H01	Continuous temperature recording					H26	Silicates				
H02	Continuous salinity recording					H27	Alkalinity				
H03	Discrete temperature measurements					H28	pH				
H04	Discrete salinity measurements					H29	Chlorinity				
NEAR SEA FLOOR (≤ 10 m)						H30	Trace elements				
H05	Continuous temperature recording					H31	Radioactivity				
H06	Continuous salinity recording					H32	Isotopes ^{Pb/Th} in sediment	5	C	A	9
H07	Discrete temperature measurements	7	D	A	9	H33	Dissolved gases				
H08	Discrete salinity measurements	7	D	A	9	H90	Other measurements				
HP PHYSICAL											
H09	Classical oceanographic stations										
H10	Vertical profiles (STD/CTD)					P - POLLUTION					
H11	Sub-surface measurements underway					P01	Suspended solids				
H12	Mechanical bathythermograph (No. of drops)					P02	Heavy metals in sediment	24	C	A	9
H13	Bathythermograph-expendable (No. of drops)					P03	Petroleum residues in sediment	24	B	A	9
H14	Sound velocity stations					P04	Chlorinated hydrocarbons				
H15	Acoustic stations					P05	Other dissolved substances				
H16	Transparency					P06	Thermal pollution				
H17	Optics					P07	Waste water: BOD				
H18	Diffusion (Dynamic)					P08	Waste water: Nitrates				
H80	Other measurements					P09	Waste water: Microbiology				
						P10	Waste water: Other				
						P11	Discolored water				
						P12	Bottom deposits				
HC CHEMICAL						P13	Contaminated organisms				
H21	Oxygen	7	D	A	9	P90	Other measurements				
H22	Phosphates						Heavy metals in pore water	5	C	A	9
H23	Total-P						Petroleum residues in pore water	5	B	A	9
H24	Nitrates										
H25	Nitrites										