

CRUISE REPORT  
FOR  
MMS CRUISE CAMP 1-3, LEG 4  
MMS CRUISE CAMP 2-1, 2-2  
CALIFORNIA OCS PHASE II MONITORING PROGRAM  
AUGUST 21, 1987

Performed for

U. S. Department of the Interior  
MINERALS MANAGEMENT SERVICE  
Pacific OCS Office

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CRUISE REPORT  
FOR  
MMS CRUISE CAMP 1-3, LEG 4  
MMS CRUISE CAMP 2-1  
MMS CRUISE CAMP 2-2

1.0 INTRODUCTION

During July, 1987, there were three cruises performed for the California OCS 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 has been selected for hard-bottom, site-specific monitoring, and Platform Julius (Lease P-0409) off Point Sal has been 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 the July cruises was to provide critical pre-drilling baseline data to help make these kinds of correlations and inferences.

The first cruise, CAMP 1-3, LEG 4 (Hard-Bottom Photosurveys/Search and Recovery Cruise) was the final leg of Cruise CAMP 1-3, May 1987. This cruise was performed to complete unfinished work which was the result of adverse weather conditions and equipment failures encountered on Cruise CAMP 1-3, LEG 3 in May, 1987. Cruise CAMP 2-1 (Soft-Bottom Life-History Cruise) was the first cruise of the second year for the California OCS Phase II Monitoring Program. The primary objective of this cruise was to collect benthic infauna samples for life-history analysis. Cruise CAMP 2-2 (Sediment-Transport Instrument-Retrieval Cruise) had a primary objective to recover moored instruments (GEOPROBES and current meters) which were deployed in the Platform Julius Study Area during May, 1987.

The Cruise Chief Scientists; Mr. Dane Hardin, Mr. James Campbell and Dr. David Cacchione have submitted reports (attached) of cruise activities.

International Underwater Contractor's M/V Aloha was the support vessel for each of the July cruises. The cruises were scheduled as follows:

CAMP 1-3, LEG 4	Hard-Bottom Photosurveys/Search and Recovery Cruise 13-23 July, 1987
CAMP 2-1	Soft-Bottom Life-History Cruise 23-28 July, 1987
CAMP 2-2	Sediment-Transport Instrument-Retrieval Cruise 28-31 July, 1987

3.0 CRUISE PLAN  
MMS CRUISE CAMP 2-1  
Soft-Bottom Life-History Cruise  
23-28 July, 1987

3.1 Introduction

A component of the benthic infauna task are (Macrofauna and Meiofauna) measurements for the life-history parameters on approximately 10 dominant species. The analysis will include species from both the macrofauna and meiofauna. The purpose of these studies is to determine the times of settlement and recruitment as well as size-frequency distributions of populations of each species on a seasonal basis. Species will be collected from platform and comparison sites. If juvenile cohorts are identified and followed with time, then it should be possible to detect any impact of drilling-related activities on individual year class.

3.2 Objectives

The objectives of the Soft-Bottom Life-History Cruise were to collect three replicate box cores or grabs at each of the nine regional stations (R-1 through R-9) and three selected primary site-specific stations (PJ-1, PJ-10, and PJ-11). Each box core or grab was to be sampled for benthic infauna (macrofauna and meiofauna), and sediment grain-size.

3.3 Results

International Underwater Contractor's M/V Aloha departed Ventura Harbor at 0000 hours on Friday, 24 July and returned at 0400 hours on Tuesday, 28 July, 1987. Sampling operations were hindered due to consistently adverse weather conditions of 25-30 kt winds and 6-10 ft seas and swells. Samples were collected at five regional stations (R-1, R-4, R-5, R-6, and R-8) and one site-specific station (PJ-1).

The cruise track and study area is shown in Figure 3-1. A summary of samples collected is shown in Table 3-1.

TABLE 3.1 SUMMARY OF SAMPLES COLLECTED ON MMS CRUISE CAMP 2-1

Sample Type	Number of Stations	Number of Replicates/ Station	Total Number/ Cruise	Sample Custody
0.1m <sup>2</sup> Grab	6	3	18	Battelle, Ventura
Macrofauna	6	3	18	Battelle, Ventura
Meiofauna	6	3	18	Univ. of Texas
Sediment Grain-Size	6	3	18	Kinnetics

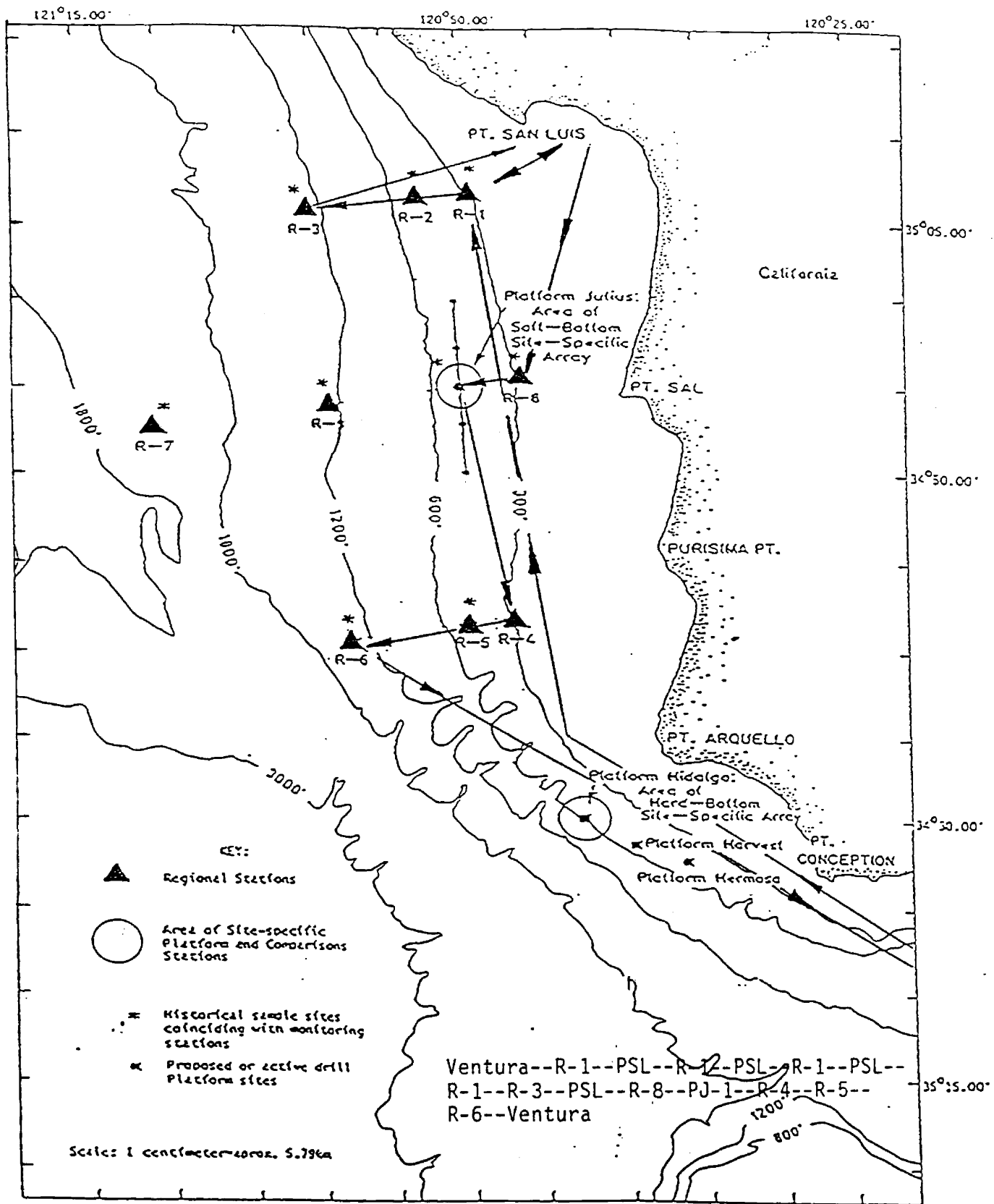


Figure 3-1. Map of study area with locations of site-specific and regional sampling stations. Platform sites and historical sampling sites that coincide with monitoring stations also are shown.

### 3.4 Activities

23 July 1987	1100-2200	Load M/V <u>Aloha</u> .
24 July 1987	0000	Departed Ventura Harbor.
	1200	Sampling and safety meeting.
	1300-1430	Station R-1 box coring attempts.
	1500	Shallow water box core test, wind 30 kts.
	1700	Winch malfunction, 100 ft of wire-out.
	1830	Box core on deck. Headed to San Luis.
	2100	Departed San Luis for Stations R-1.
	2200	Arrived at R-1, poor conditions, to PSL.
25 July 1987	0400	Departed PSL for R-1.
	0500-0800	Arrived R-1, box coring attempts.
	0800-1000	Switched to Smith-McIntyre grab, added weights.
	1030	Acceptable sample with grab.
	1100	Ship's steering malfunctioned, wind to 30 kt.
	1200	Arrived PSL without rudder control.
	1400	Steering repaired. Wind 30 kts. in Port San Luis Harbor (very unusual).
	1530	Contacted J. Hyland, established priorities.
	2300	Departed PSL for R-1 evaluation.
	2330	R-1 conditions still poor.
26 July 1987	0400	Departed Port San Luis for R-1.
	0600-0630	Collected replicates 1 & 2 at R-1. Wind 10-15 kts and was building rapidly.
	0630-0800	Enroute to R-3, (R-2 not priority).
	0815	Grab in water, winch malfunction. Wind 30 kts.
	0930-1400	Winch repaired, several grab attempts. Conditions too hazardous at this time to continue.
	1545-2300	Port San Luis Harbor.
27 July 1987	0100	Arrived at R-8, conditions workable.
	0130	Collected R-8 replicate 1.
	0200-0400	Several grab attempts, repaired grab jaws.
	0400-0430	Completed R-8.
	0430-0500	Transit to PJ-1. Wind 10-15 kts.
	0500-0700	Samples collected at PJ-1.
	0700-1000	Transit to R-4.
	1000-1130	Samples collected at R-4.
	1130-1200	Transit to R-5.
	1200-1330	Samples collected at R-5.
	1330-1530	Transit to R-6.
	1530-1730	Samples collected at R-6.
	1730	Departed study area for Ventura Harbor.
28 July 1987	0400	Arrived Ventura Harbor.

### 3.5 Navigation

The Northstar 7000 LORAN-C receiver was the primary navigational aid for Cruise CAMP 2-1. 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/longitude, LORAN time delays, samples collected, and general comments. The ship's position was displayed digitally on a monitor, while simultaneously recording 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 Group Repetition Interval (GRI) using the X and Y secondary stations, the 27-K and 41-K lines, respectively. All station navigation was based on LORAN time delays established in conjunction with the Miniranger System on previous cruises. The latitude and longitude coordinates listed in this report are the products of the Northstar algorithm. The latitudes and longitudes from the Northstar are offset from geodetic coordinates and should not be used for station navigation purposes.

Station depths listed in this report are reference depths, as station depth was not recorded during this cruise.

Time was recorded in Pacific Daylight Time (PDT) during this cruise.

Station reference coordinates are listed in Table 3.2. A summary of sample positions is shown in Table 3.3.

### 3.6 Grab Sampling

A 0.1m<sup>2</sup> Gray-O'Hara Box Core was intended as the primary sampling equipment for Cruise CAMP 2-1. However, due to adverse weather conditions, repeated attempts with the box core proved unsuccessful. The Smith-McIntyre Grab was the appropriate instrument for rough sea conditions. All samples were collected using the 0.1m<sup>2</sup> Smith-McIntyre Grab.

Three replicate grabs were collected at five regional stations (R-1, R-4, R-5, R-6, and R-8) and one site-specific station (PJ-1). Each grab was first subsampled for meiofauna by inserting a single 2-cm diameter core tube into the sediment. The upper 4-cm fraction was processed and preserved. The intended meiofauna sampling method was to collect a sample to the 10-cm depth, however, since the closing action of the grab jaws tends to disturb the lower layers of the sample, Dr. Paul Montagna chose to limit the meiofauna sample depth to 4-cm in order to maintain a representative sample.

Following the collection of the meiofauna sample, two 3-cm diameter x 2-cm depth sediment plugs were removed from the grab for the purpose of sediment grain-size analysis. The remaining fraction of the sample was transferred to elutriating buckets and processed with filtered seawater through a 0.3-m mesh sieve. The residual was rinsed into 16-oz glass jars and preserved with approximately 10-percent formalin.

### 3.7 Cruise Participants

#### Battelle Ocean Sciences, Ventura Operations

James Campbell  
Janet Kennedy

Elaine Byers  
Valerie Eikermann

#### University of Texas, Port Aransas

Dr. Paul Montagna  
Richard Kalke

John Kern  
Eileen Lampp

### 3.8 Acknowledgements

Many thanks to all members of the scientific party for their perserverance and hard work resulting in a safe and semi-successful cruise. Our thanks to the crew of the M/V Aloha for keeping us on station and keeping the winch on-line.



TABLE 3-2. REFERENCE COORDINATES FOR SOFT-BOTTOM LIFE-HISTORY STATIONS

Station	Latitude Longitude	UTM Coordinates	LORAN Time Delays	Depth (M)
R-1	35°05.57'N 120°49.15'W	N3885790 E698776	27794.9 42044.9	91
R-2	35°05.16'N 120°53.43'W	N3885047 E692345	27780.8 42057.1	161
R-3	35°05.02'N 121°00.84'W	N3884443 E680956	27756.2 42081.0	409
R-4	34°43.17'N 120°47.27'W	N3843676 E702399	27800.3 41921.5	92
R-5	34°42.85'N 120°50.69'W	N3842964 E697156	27789.8 41932.0	154
R-6	34°41.46'N 120°57.79'W	N3840354 E686413	27768.0 41949.8	410
R-7	34°52.66'N 121°10.26'W	N3861248 E667092	27727.7 42047.7	565
R-8	34°55.27'N 120°45.80'W	N3866433 E704208	27805.6 41978.2	90
R-9	34°53.49'N 120°59.05'W	N3863016 E684098	27763.2 42014.9	410
PJ-1	34°55.69'N 120°49.83'W	N3867215 E698032	27792.5 41994.6	145
PJ-10	34°53.55'N 120°49.86'W	N3863215 E698119	27792.5 41983.6	147
PJ-11	34°57.80'N 120°49.88'W	N3871214 E697946	27792.6 42006.0	136

Latitude/Longitude from Northstar 7000 Algorithm.

TABLE 3.3. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 2-1 (M/V Aloha)

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2-2

Station	Date and Time (PDT)	Sample	Latitude Longitude	LORAN Time Delays	Depth (M)	Comments
R-1	Reference Coordinates		35°05.57'N 120°49.15'W	27794.9 42044.9	91	
R-1	25 July 87 ✓ 1023	Grab 1 GB	35°05.58'N 120°49.09'W	27795.3 42044.7	91	Several previous attempts with box core were unsuccessful. Grab minimal water layer. Seas and wind high. Ship's steering failed - San Luis
R-1	26 July 87 ✓ 0605	Grab 2	35°05.46'N 120°49.10'W	27795.2 42044.0	91	Overlying water. Wind 15 kts and building quickly.
R-1	26 July 87 ✓ 0624	Grab 3	35°05.50'N 120°49.09'W	27795.2 42044.3	91	Very good sample surface. Wind speed has doubled in a half hour - now 30 kts.
R-4	Reference Coordinates		34°43.17'N 120°47.27'W	27800.3 41921.5	92	
R-4	27 July 87 ✓ 1049	Grab 1	34°43.15'N 120°47.30'W	27800.3 41921.5	92	Very good sample surface. Excellent positioning. Wind 15 kts.
R-4	27 July 87 ✓ 1108	Grab 2	34°43.17'N 120°47.28'W	27800.3 41921.5	92	Very good sample surface. Excellent positioning. Wind 15 kts.
R-4	27 July 87 ✓ 1126	Grab 3	34°43.15'N 120°47.30'W	27800.3 41921.4	92	Penetration shallower than previous grabs. Very clear surface water.

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TABLE 3.3. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 2-1 (M/V Aloha) (Continued)

Station	Date and Time (PDT)	Sample	Latitude Longitude	LORAN Time Delays	Depth (M)	Comments
R-5	Reference Coordinates		34°42.85'N 120°50.69'W	27789.8 41932.0	154	
R-5	27 July 87 ✓ 1237	Grab 1	34°42.85'N 120°50.60'W	27790.1 41931.7	154	Good surface, shallow penetration.
R-5	27 July 87 ✓ 1309	Grab 2	34°42.84'N 120°50.71'W	27789.7 41932.0	154	Good surface, overlying water, good penetration.
R-5	27 July 87 ✓ 1334	Grab 3	34°42.88'N 120°50.72'W	27789.7 41932.3	154	Good surface, shell hash.
R-6	Reference Coordinates		34°41.46'N 120°57.79'W	27768.0 41949.8	410	
R-6	27 July 87 1540	Grab 1	34°41.33'N 120°57.83'W	27767.9 41949.4	410	Good surface, clear water. Logged late.
R-6	27 July 87 ✓ 1653	Grab 2	34°41.48'N 120°57.79'W	27767.9 41950.1	410	Good penetration, water layer disturbed and cloudy. Previous attempt; wire fouled on grab.
R-6	27 July 87 ✓ 1729	Grab 3	34°41.40'N 120°57.65'W	27768.4 41949.2	410	Good surface, clear water, molluscs in sample.

TABLE 3.3. SUMMARY OF SAMPLE POSITIONS ON CRUISE CAMP 2-1 (M/V Aloha) (Continued)

Station	Date and Time (PDT)	Sample	Latitude Longitude	LORAN Time Delays	Depth (M)	Comments
R-8	Reference Coordinates		34°55.27'N 120°45.80'W	27805.6 41978.2	90	
R-8	27 July 87 ✓ 0134	Grab 1	34°55.32'N 120°45.74'W	27805.8 41978.4	90	Good sample. Wind 10 kts.
R-8	27 July 87 ✓ 0416	Grab 2	34°55.16'N 120°45.83'W	27805.6 41977.8	90	Three previous attempts n.g. due to grab-jaw damage. Repaired. Good sample.
14 R-8	27 July 87 ✓ 0438	Grab 3	34°55.26'N 120°45.79'W	27805.7 41978.3	90	Good sample.
PJ-1	Reference Coordinates		34°55.69'N 120°49.83'W	27792.5 41994.6	145	
PJ-1	27 July 87 0551	Grab 1	34°55.61'N 120°49.83'W	27792.6 41994.3	145	Sample slightly disturbed. Wind and seas building. Taking on much water at stern but tolerable.
PJ-1	27 July 87 ✓ 0617	Grab 2	34°55.69'N 120°49.88'W	27792.4 41994.8	145	Overlying water slightly disturbed.
PJ-1	27 July 87 ✓ 0646	Grab 3	34°55.68'N 120°49.86'W	27792.5 41994.7	145	Good sample, much detritus and many ophiuroids.



# B - BIOLOGY

	NUMBER	i	l	FORMAT		NUMBER	i	l	FORMAT
B01 Primary productivity					B31 Vitamin concentrations				
B02 Phytoplankton pigments					B32 Amino acid concentration				
B03 Seston					B33 Hydrocarbon concentrations				
B04 Particulate organic carbon					B34 Lipid concentrations				
B05 Particulate organic nitrogen					B35 ATP-ADP-AMP concentrations				
B06 Dissolved organic matter					B36 DNA-RNA concentrations				
B07 Bacterial and pelagic micro-organisms					B37 Taggings				
B08 Phytoplankton					B80 Other measurements				
B09 Zooplankton									
B10 Neuston					<b>BS TYPES OF STUDIES</b>				
B11 Nekton					B51 Identification	6	A	A	9
B12 Invertebrate nekton					B52 Spatial and temporal distribution	6	A	A	9
B13 Pelagic eggs and larvae					B53 Monitoring and surveillance	6	A	A	9
B14 Pelagic fish					B54 Biomass determination				
B15 Amphibians					B55 Description of communities	6	A	A	9
B16 Benthic bacteria and micro-organisms					B56 Food chains energy transfers				
B17 Phytobenthos					B57 Population and environments	6	A	A	9
B18 Zoobenthos	6	A	A	9	B58 Population structures	6	A	A	9
B19 Commercial demersal fish					B59 Taxonomy, systematics, classification	6	A	A	9
B20 Commercial benthic molluscs					B60 Physiology				
B21 Commercial benthic crustacean					B61 Behaviour				
B22 Attached plants and algae					B62 Pathology, parasitology				
B23 Intertidal organisms					B63 Toxicology				
B24 Borers and foulers					B64 Gear research				
B25 Birds					B65 Exploratory fishing				
B26 Mammals and reptiles					B66 Commercial fishing				
B27 Deep scattering layers					B67 Aquaculture				
B28 Acoustical reflections on marine organisms					B90 Other measurements				
B29 Biologic sounds									
B30 Bioluminescence									



# H- HYDROGRAPHY

HS SURFACE		NUMBER	i	l	FORMAT	HC CHEMICAL		NUMBER	i	l	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				
<b>NEAR SEA FLOOR (<math>\leq 10</math> m)</b>						H30	Trace elements				
H05	Continuous temperature recording					H31	Radioactivity				
H06	Continuous salinity recording					H32	Isotopes				
H07	Discrete temperature measurements					H33	Dissolved gases				
H08	Discrete salinity measurements					H90	Other measurements				
<b>HP PHYSICAL</b>											
H09	Classical oceanographic stations										
H10	Vertical profiles (STD/CTD)					<b>P - POLLUTION</b>					
H11	Sub-surface measurements underway					P01	Suspended solids				
H12	Mechanical bathythermograph (No. of drops)					P02	Heavy metals in sediment	1	C	A	9
H13	Bathythermograph-expendable (No. of drops)					P03	Petroleum residues in sediment	1	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				
<b>HC CHEMICAL</b>						P13	Contaminated organisms				
H21	Oxygen					P90	Other measurements				
H22	Phosphates										
H23	Total-P										
H24	Nitrates										
H25	Nitrites										



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MMS CRUISE CAMP 2-1, 2-2  
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4.0 CRUISE REPORT  
MMS CRUISE CAMP 2-2  
Sediment-Transport Instrument-Retrieval Cruise  
28-31 July, 1987

4.1 Objectives

The objectives of this cruise were to:

1. Recover USGS moorings and GEOPROBE tripods at sites R-8 and R-9;
2. Obtain box cores and CTD profiles at selected sites; and
3. Navigate mooring locations for future recovery of anchors.

4.2 Activities

The M/V Aloha departed Ventura, CA at about 0100, 29 July for transit to site R-8. We arrived in the area of R-8 about 1000, 29 July. The winds were moderate (15 kts.) from the NW.

The mooring and GEOPROBE were interrogated and responded properly. We made preparations for precise navigation of the mooring position. The mooring was navigated using the Miniranger and acoustic transponder - 1100 to 1300, 29 July.

The wind speed continued to increase in early afternoon and it was felt that a recovery attempt would be dangerous to equipment and personnel. The winds were steady at 20-25 knots with higher gusts. Box coring was not feasible due to seas and the low stern freeboard of the M/V Aloha.

Operations were suspended until 0100, 30 July when it was believed that the strong coastal winds would diminish. Unfortunately, the "usual" early morning calm never materialized; winds continued to be greater than 20 knots from the NW and, by now, the seas were 8-12 ft and steep.

At 0900, 30 July, the weather forecasts indicated a continuation of strong winds and small craft warnings were posted for the Point Sal area. We decided, after discussion with Jeff Hyland, Program Manager, to check conditions at R-8 once more and if conditions were still unsuitable for safe work, we would return to Ventura.

Conditions at R-8 had not changed and, therefore, we continued to Ventura, CA arriving at about 0400, 31 July 1987.

Summary

Although weather conditions were not good, they were not unusual for this season off central California. Due to the low freeboard on the stern, the M/V Aloha does not provide a safe working environment under adverse and extreme weather conditions .

CRUISE REPORT  
FOR  
MMS CRUISE CAMP 1-3, LEG 4  
MMS CRUISE CAMP 2-1  
MMS CRUISE CAMP 2-2

1.0 INTRODUCTION

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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 the July cruises was to provide critical pre-drilling baseline data to help make these kinds of correlations and inferences.

The first cruise, CAMP 1-3, LEG 4 (Hard-Bottom Photosurveys/Search and Recovery Cruise) was the final leg of Cruise CAMP 1-3, May 1987. This cruise was performed to complete unfinished work which was the result of adverse weather conditions and equipment failures encountered on Cruise CAMP 1-3, LEG 3 in May, 1987. Cruise CAMP 2-1 (Soft-Bottom Life-History Cruise) was the first cruise of the second year for the California OCS Phase II Monitoring Program. The primary objective of this cruise was to collect benthic infauna samples for life-history analysis. Cruise CAMP 2-2 (Sediment-Transport Instrument-Retrieval Cruise) had a primary objective to recover moored instruments (GEOPROBES and current meters) which were deployed in the Platform Julius Study Area during May, 1987.

The Cruise Chief Scientists; Mr. Dane Hardin, Mr. James Campbell and Dr. David Cacchione have submitted reports (attached) of cruise activities.

International Underwater Contractor's M/V Aloha was the support vessel for each of the July cruises. The cruises were scheduled as follows:

CAMP 1-3, LEG 4	Hard-Bottom Photosurveys/Search and Recovery Cruise 13-23 July, 1987
CAMP 2-1	Soft-Bottom Life-History Cruise 23-28 July, 1987
CAMP 2-2	Sediment-Transport Instrument-Retrieval Cruise 28-31 July, 1987