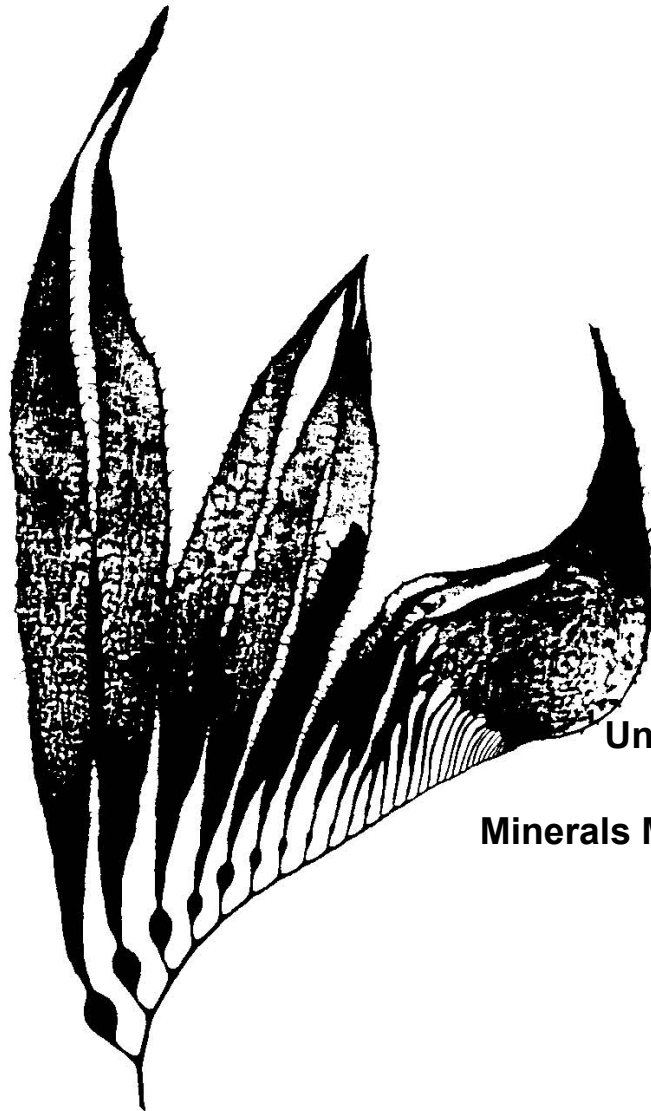


**COASTAL MARINE INSTITUTE
PROGRAM YEAR 5
QUARTERLY REPORT 2**

for the period

October 1, 1998 – December 31, 1998



*A Cooperative Program
between the*
University of California
and the
Minerals Management Service

January 13, 1999

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Russell J. Schmitt
Program Manager

Coastal Research Center
Marine Science Institute
University of California
Santa Barbara, California 93106

January 13, 1999

Program Manager's Report

for the period October 1, 1998 – December 31, 1998

This constitutes the quarterly report for the second quarter for Program Year 5 of the Coastal Marine Institute, a cooperative research agreement between the Minerals Management Service, the state of California and the University of California.

As of this quarter, 10 projects currently are being conducted under the aegis of the Coastal Marine Institute.

Actions Pending MMS Approval:

- Task 12387: *Ecological Consequences of Alternative Abandonment Strategies for POCS Offshore Facilities and Implications for Policy Development*, has requested a no-cost extension;
- Task 13094: *Application of Coastal Ocean Dynamics Radars for Observation of Near-Surface Currents off the South-Central California Coast*, requires approval for use of equipment funds to purchase computers for data analyses;
- Task 13095: *Effects of Produced Water on Complex Behavioral Traits of Invertebrate Larvae and Algal Zoospores*, has requested a no-cost extension.

Major Programmatic Progress and Actions during the Quarter:

- Task 13293: *Aerial Surveys of Marine Birds and Mammals in Santa Barbara Channel and the Santa Maria Basin* has been completed and the draft final study report has been submitted to MMS for review;
- Task 12392: *Development of Methods for Surfgrass (*Phyllospadix* spp.) Restoration Using Early Life History Stages* has been completed and the draft final study report will be submitted to MMS next month;
- Task 12391: *Effect of Offshore Oil Platform Structures on the Distribution Pattern of Commercially Important Benthic Crustaceans, with Emphasis on the Rock Crab*, has been completed and the draft final study report will be submitted to MMS next month;
- Task 13096: *Utilization of Sandy Beaches by Shorebirds: Relationships to Population Characteristics of Macrofauna Prey Species and Beach Morphodynamics*, has been completed and the draft final study report will be submitted to MMS next month.

Task 12387: *Ecological Consequences of Alternative Abandonment Strategies for POCS Offshore Facilities and Implications for Policy Development*

Principal Investigators: **Mark H. Carr**, Department of Biology, University of California, Santa Cruz, CA 95064, **Graham E. Forrester**, Dept. of Biology, University of California, Los Angeles, CA 90095-1606, and **Michael V. McGinnis**, Coastal Research Center and Ocean and Coastal Policy Center, Marine Science Institute, University of California, Santa Barbara, CA 93106

Major Accomplishments, October 1, 1998 through December 31, 1998

We continued to focus our efforts on processing and analyzing data this past quarter. The primary tasks conducted this past quarter were:

- Continued development of the database, integrating transect volumes with fish counts to estimate fish density by species and size class. Transect volumes are based on the lengths of structural members sampled on platforms. These volumes were used in conjunction with diver and ROV-video recorded fish counts to calculate fish densities.
- Statistical analysis of the diver collected databases were continued.
- Processing of the ROV video tapes to determine fish size distributions (based on laser methods). Technicians and volunteers (one UCSC graduate student and two UCSC undergraduates) located, measured, and recorded fish identification, counts and size estimates from oil platforms dives and natural reefs. This task is now approximately 85% completed.

Problems Encountered:

None.

MMS Action Required:

None.

Future plans:

Further analysis and preparation of publications.

Estimated Percentage of Budget Expended:

Project Year 1	100%
Project Year 2	100%
Project Year 3	87%

Task 12388: *Joint UCSB-MMS Pacific OCS Student Internship and Trainee Program*

Principal Investigators: **Jenifer Dugan**, Coastal Research Center, Marine Science Institute, University California, California. 93106, and **Edward A. Keller**, Environmental Studies Program, University of California, Santa Barbara, California, 93106

Major Accomplishments, October 1, 1998 – December 31, 1998

Jeff Mason worked with Mike McCrary at MMS and Jenny Dugan at UCSB on the shorebirds project. We will be hiring a new intern in January, Heather Walling. Heather will work with Mike McCrary and Mary Elaine Dunaway doing a literature search and summarizing articles related to their mussel recovery plot study. We are advertising for several new intern positions and have received some applications.

Eric Smith will present an Information Transfer Seminar in January. Jenny Dugan is working with Fred Piltz to determine which projects should present talks next quarter.

Future plans:

New interns will be hired as needs are identified.

Estimated Percentage of Budget Expended:

Project Year 1: 100%
Project Year 2: 100%
Project Year 3: 20%

Task 12390: *Testing and Calibrating the Measurement of Nonmarket Values for Oil Spills Via the Contingent Valuation Method*

Principal Investigators: **W. Michael Hanemann**, Department of Agricultural and Resources Economics, University of California, Berkeley, California 94720, and **Jon A. Krosnick** Department of Psychology, The Ohio State University, Columbus, Ohio

Major Accomplishments, October 1, 1998 - December 31, 1998

Most of this period was spent waiting to launch the field survey – waiting for approval of our no-cost extension, and waiting to transfer funds for the survey to the Ohio State University. These were all accomplished by the end of November. While we were waiting, we finalized the bid design for the survey, and worked on survey methodology issues. The survey was finally launched at the beginning of December, and is now in the field.

Problems Encountered:

There were administrative delays in securing the no-cost extension for the survey, which have now been resolved.

Future plans:

We expect to continue and complete the survey by the end of February, 1999 and to complete the analysis of the survey data by the end of April, 1999.

Estimated Percentage of Budget Expended:

Project Year	90%
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Task 13094: *Application of Coastal Ocean Dynamics Radars for Observation of Near-Surface Currents off the South-Central California Coast*

Principal Investigators: Libe Washburn, Department of Geography, University of California, Santa Barbara, CA 93106, Steven D. Gaines, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, CA 93106

Major Accomplishments, October 1, 1998 through December 31, 1998

This quarter our biggest accomplishment was the installation of two additional radar sites on Vandenberg Air Force Base (VAFB). This effort required over 1 and ½ years of interaction with the Air Force, but we have at last succeeded (hurray!!). The sites, one at Pt. Arguello and the other just south of Pt. Sal. became operational in November. Both sites have experienced some minor (and normal) start up difficulties, but data from both sites have been obtained. The problems are not serious: at Pt. Arguello hardware problems arose with the transmit electronics; at Pt. Sal the data acquisition computer occasionally crashes. We are replacing both the computer and transmit electronics with equipment from the closer Coal Oil Pt. site. After repair these will be reinstalled at Coal Oil Point. The radar array now consists of 5 sites, spanning the region around Pts. Conception and Arguello.

Results from our work were presented in three national and international meetings this fall: 1) one presentation at the Eastern Pacific Ocean Conference in September; 2) two presentations at the Fall American Geophysical Union (AGU) Meeting in San Francisco in December; and 3) one presentation at a workshop on marine ecology in Las Cruces, Chile in December. In all cases our research results were received with great interest.

Our group has continued development of MATLAB programs for viewing and analyzing the large amounts of radar-derived surface current data. We are sharing these programs with our colleagues at the Naval Post graduate school in Monterey, California. A recent result is a near year-long record of vorticity that shows the seasonal spin-up of the eddy in the western Santa Barbara Channel. We have continued our comparisons of radar-derived current data with results from *in situ* current meters. This comparison was the subject of one of our presentations at the AGU meeting in San Francisco.

Problems Encountered:

We have been denied access in driving across the Bixby Ranch to service our site at Pt. Conception. This is not the result of any mistake on our part; apparently the Bixby Ranch was not aware that we were crossing their property. We thought we had permission based on our agreement with the Coast Guard. We are still able to service the site by riding across the Ranch with the Coast Guard. However, we hope to gain permission from the Bixby Ranch.

MMS Action Required:

We may require assistance from MMS in negotiating with the Bixby Ranch to cross their property. We are concerned that the quarterly access with the Coast Guard is not frequent enough to maintain the site.

Estimated Percentage of Budget Expended:

Project Year 1	100%
Project Year 2	100%
Project Year 3	52%

Task 13095: *Effects of Produced Water on Complex Behavioral Traits of Invertebrate Larvae and Algal Zoospores*

Principal Investigator: **Peter Raimondi**, Department of Biology, University of California, Santa Cruz, CA 95064

Major Accomplishments, October 1, 1998 through December 31, 1998

Work on the original project has stopped completely. Unless the situation changes, we will not be able to complete this project as the grant was written. As I wrote in the last quarterly report, we were having difficulties obtaining produced water. In late November, we heard from Dave Panzer at MMS Camarillo that we have been denied access to more produced water by various oil companies. As we have no more supplies, this effectively ends all further work with produced water.

We are looking into using other oil-based toxicants in collaboration with colleagues and feel confident the project will continue in a different direction. It is unfortunate that this situation occurred. The laboratory experiments are ready to go ahead. The field experiments were successful this year and we were looking to expand them next year.

We will be able to complete a study, however it will not be the project MMS originally funded. The MMS-CMI director, Russ Schmitt has been fully apprised of the situation.

Personnel, October 1st - October 1st 1998:

During this period the Post-Doctoral Researcher, Anthony Boxshall, was the main researcher on this grant. At present, we have two students, Derek Smith and Sally Owings helping with various aspects of this project. Derek is a work study student and Sally is an intern.

Estimated Percentage of Budget Expended:

Project Year 1: 95%

Task 14181: *Population Trends and Trophic Dynamics in Pacific OCS Ecosystems:
What Can Monitoring Data Tell Us?*

Principal Investigators: **Russell J. Schmitt**, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, CA 93106 and **Andrew J. Brooks**, Coastal Research Center, Marine Science Institute, University of California, Santa Barbara, CA 93106

Major Accomplishments, October 1, 1998 through December 31, 1998

Our MMS-UC CMI funded research encompasses two separate objectives: (1) the analysis and synthesis of existing long-term monitoring data and (2) the continued annual surveys of subtidal reef communities at Santa Cruz Island.

(1) The analysis and synthesis of existing long-term monitoring data.

We have continued with our efforts to obtain additional long-term datasets. All of our 1998 Santa Cruz Island data has now been converted into an electronic format. We continue to use this dataset to develop and test our relational database formats. We anticipated that this process would be the most time consuming and it has proven to be so. We have also begun to convert the raw abundance data contained in these datasets into the more ecologically meaningful metrics needed for use in our meta-analyses.

(2) The continued annual surveys of subtidal reef communities at Santa Cruz Island.

We have completed the second year of our monitoring of the abundances of surfperches, their invertebrate prey, and the cover of benthic microhabitats at the 11 permanent study sites on the south coast of Santa Cruz Island. Sampling of fish (via visual counts along permanent band transects) and of the cover of benthic microhabitats (via random point contact methods) were accomplished in the manner described in our proposal. We are currently processing the samples collected for the quantification of available food resources.

Publications and Presentations:

We are still in the initial stages of compiling and verifying the data which will compose our master database. To date we have no publications.

Estimated Percentage of Budget Expended:

Project Year 1 11%

Task 15116: *Wave Prediction in the Santa Barbara Channel*

Principal Investigators: **Robert T. Guza** and **William C. O'Reilly**, Center for Coastal Studies, Scripps Institution of Oceanography, La Jolla, CA 92093

Major Accomplishments, October 1, 1998 through December 31, 1998

During the 4th quarter of the project's first year, pressure sensor data collected in 1995 was processed for comparison to wave model predictions. The data is from the Ventura area of the Channel and is being used to estimate the eastward extent of the Santa Cruz Island reflected wave energy. Some data loss was encountered owing to the fact that several gage stations were buried by sediment after a large mid-experiment storm. Nevertheless, numerous wave events were measured prior to their burial, so this will not prevent useful model-data comparisons from being performed.

In addition, significant discrepancies in wave height measurements were found off Pt. Conception when comparing Scripps buoy data to nearby NOAA buoys during large wave events (greater than 4m). Discussions with the National Data Buoy Center are underway to resolve this issue.

Problems Encountered:

None

Future Plans:

Estimate the magnitude and spatial extent of wave reflection from Santa Cruz Island based on all the combined NOAA, CDIP and U.S. Naval Postgraduate School data sets.

Estimate Percentage of Budget Expended:

Project Year 1 80%

Task 15117: *Assessing Toxic Effects on Population Dynamics Using Individual-Based Energy Budget Models*

Principal Investigators: **Roger M. Nisbet**, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, CA 93106 and **Erik B. Muller**, Marine Science Institute, University of California, Santa Barbara, CA 93106

Major Accomplishments, October 1, 1998 through December 31, 1998

We continued our model analysis in variable food environments. Variations in food supply imply that organisms periodically encounters stress, and this stress adds to other forms, such as the presence of toxic contaminants whose effects we modeled previously. We are studying two forms of food variations: periodic fluctuations, which mimic alternating periods of low and high food availability, and stochastic fluctuations, which emphasize the unpredictability of the supply of food and/or the feeding behavior of an organism.

Periodic food fluctuations stimulate growth and, for part of parameter space, reproduction. Those fluctuations may also cause death through starvation. These patterns increase with the amplitude and period of the fluctuations. Stochastic food fluctuations also stimulate growth and, independent of parameter values, reproduction. On average, organisms will be bigger in a variable food environment. However, because a stochastic environment also enhances mortality, the life time reproductive output may decrease, which reduction is especially notable for high intensity food fluctuations. For the next quarter, we will analyze the mortality patterns that we observed in our simulation studies and write a manuscript for publication.

Problems encountered:

None

Future Plans:

As in proposal.

Estimate Percentage of Budget Expended:

Project Year 1 65%

Task 15118: *An Experimental Evaluation of Methods of Surfgrass (Phyllospadix torreyi) Restoration Using Early Life History Stages*

Principal Investigators: **Daniel C. Reed**, Marine Science Institute, University of California, Santa Barbara, CA 93106 and **Sally J. Holbrook**, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, CA 93106

Major Accomplishments, October 1, 1998 through December 31, 1998

During this quarter of research we continued our monthly sampling of flower abundance and flowering state at a subset of our permanent sites (seven intertidal sites and one subtidal site). We also continued our monthly sampling of seed availability at five of these sites using artificial seed collectors. All data collected to date have been entered into our data base and stored on a PC. Considerable time was spent this quarter analyzing these data for inclusion in a manuscript that is being prepared on spatial and temporal patterns of flowering, seed production, and seed availability.

Observations from our seed trap data indicate that rates of seed predation can be quite high. We completed field surveys of predator abundance at two of our intertidal seed trap sites to determine whether rates of seed predation vary with predator abundance. A field experiment testing the effects of predators on the survival of attached seeds was also completed (laboratory experiments that evaluated the foraging efficiency of the most likely seed predators were completed last quarter). Results from these studies are currently being analyzed for inclusion in a manuscript that is in preparation on seed predators and rates of seed predation in surfgrass.

Collecting seeds from the field, maintaining them in laboratory culture, and cultivating seedlings from them continues to be an ongoing time-consuming task during the flowering season. Large numbers of seeds and seedlings are needed for use in laboratory and field experiments. During this quarter of research seeds collected from the field have been used in laboratory experiments to examine (1) the ability of host algae and artificial seed collectors to retain seeds and seedlings under varying conditions of flow, and (2) whether seed germination is facilitated by seed attachment. In addition, over 2,000 seeds have been germinated and will be outplanted to one of our subtidal sites. The purpose of this experiment is not only to test different outplant techniques, but also to test various factors affecting seedling survival. We are continuing to collect information on seedling growth and rhizome expansion at one of our intertidal sites where relatively large numbers of seedlings were recruited last winter.

Future Plans:

Work will proceed as scheduled.

Estimate Percentage of Budget Expended:

Project Year 1 10%

