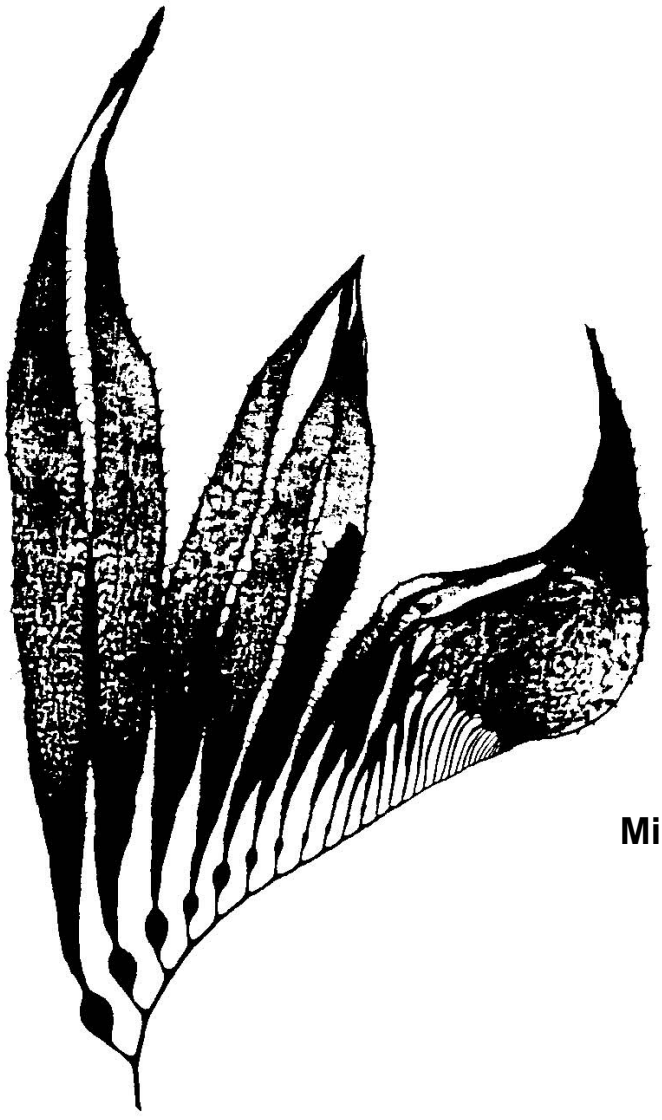
COASTAL MARINE INSTITUTE

PROGRAM YEAR 6

QUARTERLY REPORT 3

for the period

January 1, 2000 - March 31, 2000



A Cooperative Program

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University of California

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April 14, 2000

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Russell J. Schmitt
Program Manager

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

April 14, 2000

Program Manager's Report

for the period January 1, 2000 – March 31, 2000

This constitutes the quarterly report for the third quarter for Program Year 6 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, 7 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*, requires approval of a no-cost extension;
- We are awaiting comments from MMS on the draft final reports for Task 13293: *Aerial Surveys of Marine Birds and Mammals in Santa Barbara Channel and the Santa Maria Basin*.

Major Programmatic Progress and Actions during the Quarter:

- We now have a web site for the Coastal Marine Institute at http://128.111.226.115/CMI/ - copies of quarterly, annual and final reports may be downloaded from this site;
- The Final Report for Task 13096: *Utilization of Sandy Beaches by Shorebirds: Relationships to Population Characteristics of Macrofauna Prey Species and Beach Morphodynamics*, will be completed next quarter and submitted to MMS;
- Task 12389: *Valuation of Coastal Resources – Understanding Substitution in Time and Space*, has been completed and the final study report will be submitted to MMS next quarter.

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 Rhode Island, Providence, RI, 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, January 1, 2000 - March 31, 2000

We continued to focus our efforts on writing the final report and associated publications this past quarter. The primary tasks conducted this past quarter were:

- Preparing text, tables and figures for the final report and publications.
- Further analyses of fish abundance and size distributions among depths and habitats (platforms vs. natural reefs).
- M. Carr and P. Raimondi are preparing sections of the report by the University of California Select Scientific Committee on Decommissioning Alternatives established by the University of California's Office of the President (UCOP) and the University of California Marine Council.

Problems Encountered: None

MMS Action Required: Approval of no-cost extension through December 2000.

Future plans: Further analysis and preparation of final report and publications.

Estimated Percentage of Budget Expended:

Project Year 1 100%
Project Year 2 100%
Project Year 3 70%

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, January 1, 2000 - March 31, 2000

During the past quarter, we advertised for one new student intern in addition to the ongoing interns. The new intern will work with Michael McCrary at MMS on data from aerial surveys of seabirds conducted by USGS-BRD personnel. Carla Navarro finished her internship with Paul Scott at the Santa Barbara Museum of Natural History at the end of January. Morgan Matlock also completed his internship with Linwood Pendleton at the University of Southern California in January. We are working with Jim Lima and others to arrange additional internship opportunities for MMS/CMI projects during Spring and Summer 2000.

One Information Transfer Seminar was presented by Eric Ran Smith in February CMI/SCEI PI's this past quarter. We are working with Jim Lima and others to determine which projects will present talks in the spring and to develop a seminar schedule.

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: 100%
Project Year 4: 100%
Project Year 5: 47%

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

Progress to Date:
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.
To date we have analyzed 8 separate datasets collected in three different ecological systems; subtidal rocky reef, kelp bed, and open ocean pelagic. Trends in population abundances show consistent declines in all three systems over the last 10-15 years. Most interesting, within each system examined, trends for each component trophic level show approximately the same degree of decline. This pattern holds across spatial scales ranging from a single island within the northern Channel Islands group to the entire Southern California Bight. Also interesting is the fact that data collected using extremely different methodologies, e.g. coastal power plant impingement studies versus diver visual surveys, provide similar estimates of the magnitudes of these declines.

(2) The continued annual surveys of subtidal reef communities at Santa Cruz Island.
We have completed the work-up of all the 1998 samples collected at our 11 permanent survey sites off Santa Cruz Island. These data currently are being entered into our database and are being error checked. We are in the process of working-up samples collected during our 1999 surveys. All algal samples collected have been identified and weighed. Invertebrate resource samples have been rough sorted and we are now in the process of identifying the epi-faunal meso-invertebrates collected to the lowest taxon possible.

Publications and Presentations:
Brooks and Schmitt presented results from this work at the Western Society of Naturalists Meetings held in late December, 1999 and at the International Temperate Reef Symposium held in January, 2000. We are currently preparing a companion paper to these talks for publication.

Personnel associated with the project this quarter
PIs: Dr. Russell J. Schmitt, Dr. Andrew J. Brooks
Post-graduate researchers: Keith Seydel, Jorine Lawyer
Undergraduate assistants: Sarah McTee, Stephanie Mutz, Andrea DeMent

Estimated Percentage of Budget Expended:
Project Year 1 100%
Project Year 2 38%

Task 15115: *Effects of Temporal and Spatial Separation of Samples on Estimation of Impacts*

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

Major Accomplishments, January 1, 2000 - March 31, 2000

The project is continuing as planned and, although progress has been slow, there have been no major barriers to its success.

Below are the three main questions proposed by the project and progress to date.

Question 1: What are the spatial and temporal patterns in the structure of the monitored communities at all 25 monitored sites?

These patterns have now been documented.

Question 2: Should there be any modification to the sampling regime employed at the various sites?

The detailed and complex statistical analyses continue. Addressing this question awaits the outcome of all analyses, which are still in progress.

Question 3: Can the collected data be used to predict the structure of communities at previously unsampled sites?

We have not formally addressed this question. Once analyses are completed for question two, we will be in a better position as to how to approach this task.

Future plans:
1. Continue statistical analyses.
2. Design field component of project to address Question 3.

Estimated Percentage of Budget Expended:

Project Year 1: 100%
Project Year 2: 15%

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, January 1, 2000 - March 31, 2000

During the first quarter of the project's third year, work has continued on both field validation/testing of the experimental swell reflection model, and a manuscript describing wave reflection from Santa Cruz Island.

A new CDIP/MMS Web Page for wind and wave conditions in the Santa Barbara Channel is in place (http://cdip.ucsd.edu/mms). We are continuing to build and test this site before making a permanent link to the CDIP and CCS-MMS web pages for the Santa Barbara Channel.

Problems Encountered:

None

Future plans:

Completion of the wave reflection manuscript. Addition of local sea predictions in coordination with researchers from the U.S. Navy Research Laboratory at Stennis Space Center, MS.

Estimated Percentage of Budget Expended:

Project Year 1 100%
Project Year 2 85%

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, January 1, 2000 - March 31, 2000

We worked on revisions of two manuscripts. The first describes a model of growth and reproduction in variable environments (see previous report for scope and conclusions). Report of review of this paper is pending. The second paper reviews our models and modeling approach and includes a section on modeling the toxic effects on organisms. This paper has been accepted by the Journal of Animal Ecology.

We have developed a modeling framework with which top-down and bottum-up consequences of toxic effects in food chains can be quantified. Toxic effects may be encountered at various levels and may be both lethal or sublethal. We are currently analyzing a system with two trophic levels. We are also extending the model to cover the dynamics of decomposers, which are important since toxicants are known to affect nutrient levels.

We are also continuing to improve our methods for model validation, which efforts are needed, as described in a previous report, for testing our toxicity models.

Future Plans:

As in proposal.

Estimated Percentage of Budget Expended:

Project Year 1 100%
Project Year 2 74%

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, January 1, 2000 - March 31, 2000

During this quarter of research we finalized our monthly sampling of flower abundance , flowering state and seed availability at a subset of our permanent sites (five intertidal sites and one subtidal site). All the data from this phase of our reseach has been entered into a computer database and is currently being checked for accuracy. In addition, we conducted the winter sampling of all nine of our permanent intertidal sites and two of our five permanent subtidal sites. Sampling of the other three subtidal sites will be done when diving conditions improve.

We continued to monitor our experiments that test several different methods of outplanting laboratory-reared seedlings to the field. These experiments test the effects of seedling density (three levels), algal cover (two levels) and outplant technique (three levels) on seedling survivorship and growth in both intertidal and subtidal habitats. To date over five thousand seedlings have been outplanted to the field. We are preparing a follow-up experiment in April this year, which will test seedling size and planting density using a new and improved artificial substrate. Maintaining seed stock for this experiment has been an ongoing task during this quarter of research .

We are continuing to monitor experiments set up last summer that test the feasibility of transplanting adult plants as a means of restoring damaged populations. These experiments were designed specifically to test: (1) the effect of transplant size on survivorship and expansion rate of transplanted surfgrass and (2) the effect of clump size on the recovery rate of the bare patches created by collecting clumps of surfgrass for transplanting.

PIs Holbrook and Reed gave an oral presentation on the research results of this project at the Fifth International Temperate Reef Symposium held in Cape Town South Africa in February.

MMS Action Required:

None

Future Plans: Work will proceed as scheduled.

Estimated Percentage of Budget Expended:

Project Year 1 100%
Project Year 2 60%