SOUTHERN CALIFORNIA EDUCATIONAL INITIATIVE

PROGRAM YEAR 13

QUARTERLY REPORT 1

for the period

July 1, 2001 – September 30, 2001

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

October 19, 2001

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Russell J. Schmitt
Program Manager

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

October 19, 2001

Program Manager's Report

for the period July 1, 2001 – September 30, 2001

This constitutes the quarterly report for the first quarter of Program Year 13 of the Southern California Educational Initiative, a cooperative research agreement between the Minerals Management Service, the state of California and the University of California.

As of this quarter, 4 projects currently are being conducted under the aegis of the Southern California Educational Initiative.

Actions Pending MMS Approval:

- Approval of no-cost extension for *Early Development of Fouling Communities on Offshore Oil Platforms;*
- We are waiting for MMS comments on the Draft Final Report for *Mitigating the Impact of Offshore Oil Development*, Woolley and Lima, PIs.

Major programmatic progress and actions during the quarter are summarized below for the period of July 1 – September 30, 2001.

- The Final Report for project *Effects of Metal Toxicants on the Energy Budgets of Marine Organisms: A Modeling Approach*, Nisbet, PI, was submitted to MMS in hard copy format;
- The Final Report for project *The Political Economy of the Rigs-to-Reef Option for Decommissioning of Offshore Oil and Gas Structures*, McGinnis, Fernandez and Pomeroy, was submitted to MMS and PDF formats;
- The Draft Final Report for project *A Design for a Time Series Study of a NIMBY Response,* Smith PI has been submitted. It is being formatted and will be forwarded to MMS for review next quarter;
- The Final Report for project *Ecological Effects of Chronic Exposure to Produced Water: A Field Test* and *Environmental Effects of Produced Water: A BACIP Field Assessment*, Osenberg, Holbrook, Schmitt and Carr, PIs, will be submitted to MMS next quarter in hard copy and PDF formats;
- The Final Report for project *Effects of Produced Water on Demographic Rates* and *Environmental Recovery Following Cessation of a Produced Water Discharge*, Schmitt and Osenberg, PIs, will be submitted to MMS next quarter in hard copy and PDF formats;
- The Final Report for project *Effects of Biologically Degraded Oil on Marine Invertebrate and Vertebrate Embryos and Larvae*, 2001-048, Cherr, Griffin and Higashi, PIs will be submitted to MMS next quarter in hard copy and PDF formats.

Detecting Ecological Impacts: Effects of Taxonomic Aggregation in the Before-After/Control-Impact Paired Series Design

Principal Investigators: Sally Holbrook, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara, CA 93106, **Mark H. Carr**, Department of Biology, University of California, Santa Cruz, CA 95064, **Craig W**. **Osenberg,** Department of Zoology, University of Florida, Gainesville, FL 32611-8525.

Major Accomplishments, July 1, 2001 – September 30, 2001

- Processing of bivalve and crustacean samples for size-frequency analysis continues in Carr's lab at UCSC with the image analysis system. At present, bivalve samples from Gaviota have been imaged and processing of Carpinteria samples continues. A senior thesis, being conducted in his lab is being completed and is entitled, "Effects of cessation of a produced water discharge on the size frequency of a bivalve, *Telina carpenterii*, off Carpinteria, California".

- We continue to contribute to the application of BACI methodology in other contexts. BACI and the SCEI projects were highlighted in a lecture in Carr and Raimondi's UCSC undergraduate course, "Conservation in the Sea". Osenberg was an invited participant in a workshop at Lee Stalking Island, Bahamas which had as one goal to interact with Bahamian agencies to assist in the design and monitoring of a marine reserve network.

Future plans:

- Osenberg will conduct data analyses during Spring and Summer 2001, now that files have been completely updated. At this time he also will fully document and archive these files for storage (on CD). As indicated in the 2000 Annual Report, we expect this to take until *at least the end of summer 2001*. We are also continuing our effort to have all samples not involved in size frequency analyses to be archived at the Los Angeles County Museum.

Estimated Percentage of Budget Expended:

All funds were expended earlier this year. As indicated in the 2000 Annual Report, the project will not be completed until December 2001, due to unforeseen delays in the taxonomic identifications.

Effects of an Oil Spill on Multispecies Interactions that Structure Intertidal Communities

Principal Investigator: Peter Raimondi, Department of Biology, University of California, Santa Cruz, California 95460.

Major Accomplishments, July 1, 2001 - March 31, 2001

Progress and findings

The Barnacle casts that were put out at Pt. Sierra Nevada and Boathouse have been in the field for 17 months and have been sampled monthly for the presence of tar (Fig. 1). In September, at Point Sierra Nevada tar was found on 80% of the casts in the barnacle zone, while 67% of the casts in the *Silvetia* zone and 47% of the casts in the *Endocladia* zone had tar. Overall, at Boathouse tar has accumulated primarily in the barnacle and *Silvetia* zones (Fig. 1). At Boathouse tar was present on 13% of the casts in the *Endocladia* zone and on 73% of the casts in the *Silvetia* zone. While, only 7% of the casts in the *Mytilus* zone at Boathouse had tar in September. However, at Boathouse tar does not persist long in this zone. We are presently only measuring tar patches > or = to 0.5mm, it seems that patches < than 2mm degrade faster, while larger patches persist. For example, *Silvetia* cast number 7 has a tar patch that first appeared in May 2000 and was initially measured to be 14.7mm and in September 2001 it was 13.1mm.

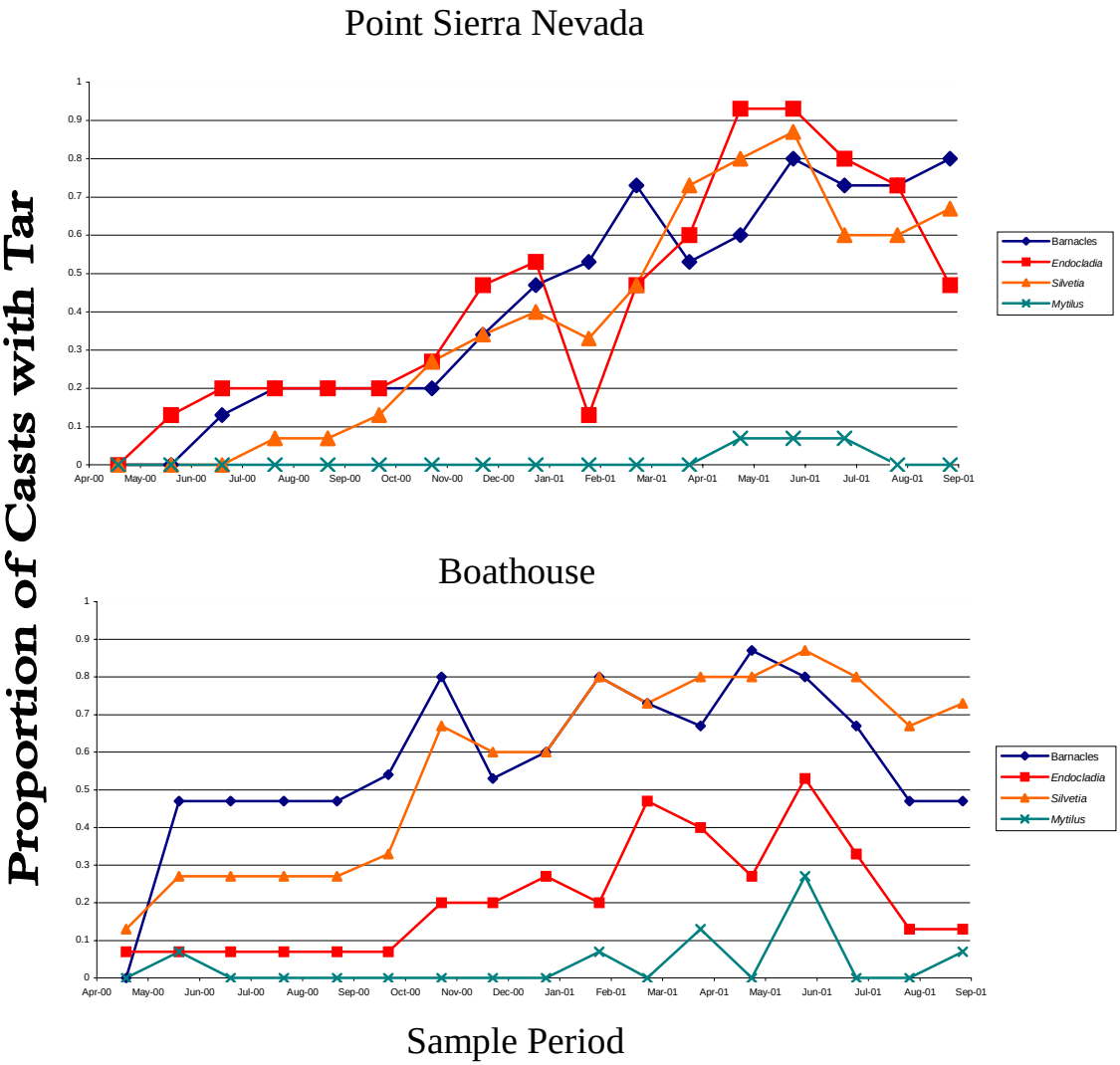

Figure 1. The Proportion of casts in 4 zones that have accumulated tar during May 2000 thru August 2001

In March 2001, we measured the surface temperature of all the casts, nearby rock and permanent plots at both Pt Sierra Nevada and Boathouse. We should have a full analysis of these data in the coming months.
In the summer of 2001, we established permanent plots at Government Point, these plots will be sampled again in the fall.

Future Plans

We will monitor both the number and size of tar patches, as well as the percent tar cover in marked plots this fall. In addition, we will continue to monitor the casts for tar accumulation and persistence on a monthly basis. We also plan to analyze the tidal height and temperature data in the upcoming months.

Personnel

Samantha Forde is funded as a graduate student research assistant
Christy Roe is funded as a laboratory technician

Estimated Percentage of Budget Expended:

Project Year 1 100%
Project Year 2 95%

A Design for a Time Series Study of a NIMBY Response

Principal Investigator: Eric Smith, Department of Political Science, University of California, Santa Barbara, California 93106

Major Accomplishments, July 1, 2001 – September 30, 2001

Draft Final report has been completed.

Future Plans: Submit Final Report.

Estimated Percentage of Budget Expended:

Project Year 1 100%

Early Development of Fouling Communities on Offshore Oil Platforms

Principal Investigators: H. Mark Page, Jenifer Dugan, and **Jason Bram**, Marine Science Institute, University of California, Santa Barbara, California 93106

Major Accomplishments, July 1, 2001 – September 30, 2001

During the reporting period, we continued to measure spatial and temporal patterns in development of the invertebrate community at depths of 6, 12, and 18 m on Platform Houchin. Permanently marked 20 cm x 20 cm quadrats on conductor pipes at Houchin, scraped at intervals of 2, 4, 6, and 12 months, were photographed in August. Vacuum samples from the 2, 4, 6, and 12-month treatments were collected at all depths in August. Biomass of the experimentally scraped plots varied significantly among exposure times (2, 4, 6 and 12 months) and depths. Mean biomass decreased with depth and increased with exposure time for all treatments and was significantly greater at the 6 m depth than at the 12 and 18 m depths for all exposure times.

The plumose anemone, *Metridium senile*, an abundant member of the invertebrate community on offshore oil platforms, may be an important competitor for space. To investigate the role that this anemone plays in the development of the platform invertebrate community, we initiated an anemone removal experiment at Platform Houchin in September. Anemones are removed from randomly selected artificial surfaces (ceramic tiles attached to PVC frames) at depths of 6, 12, and 18 m and allowed to accumulate naturally on other artificial surfaces at the same depths. We will measure biomass and the percent cover of the taxa present among treatments.

We continued to analyze data on species composition and percent cover of invertebrates that colonized ceramic tiles (15x15 cm) exposed for various time intervals (2, 4, 6, 12, 24 months) at depths of 6, 12, and 18 m at Platform Houchin from April 1999 to April 2001. Patterns of accumulation of biomass on the ceramic tiles were similar to those observed in the experimentally scraped plots (see above). Analyses of variance and subsequent post hoc tests on the mean biomass and percent cover of selected taxa present on the ceramic tiles showed that biomass was significantly greater at the 6 m depth than at the two deeper depths. Mean biomass also significantly increased with exposure time across all depths and varied significantly among dates of initial tile immersion. Invertebrate community development and the percent cover of selected taxa on the tiles also varied significantly over time, among depths, and among dates of initial tile immersion.

In August, faunal litterfall was collected and measured from traps deployed at a depth of 18 m at Platform Hogan. The average biomass of faunal litterfall found in August (1151.25 g) was the greatest amount observed to date(two years). It was approximately three times that observed during the previous August (2000) and ~35% higher than the preceding month (July, 2001). Mussels, (*Mytilus galloprovincialis)* comprised most of the faunal litterfall by weight.

Upcoming work

We will monitor and collect the artificial surfaces from the anemone removal experiment at the intervals mentioned above, and compare the percent cover of taxa and biomass among treatments. Faunal litterfall will be collected from the traps bimonthly. The data from the vacuum samples of scraped plots and quadrat images will be processed and analyzed. We will continue to examine

hypotheses concerning factors influencing community development with additional statistical analyses (Systat and Primer). In addition, a talk on the results of this study is currently being prepared for the Western Society of Naturalists conference in November. A master's thesis and manuscript on the results are also in progress.

MMS Action Required: Approval of no-cost extension.

Estimated Percentage of Budget Expended:

Project Year 1	100%
Project Year 2	94%