Dear Sheila,

Please see the enclosed SCCOOS Quarterly Report of the Coastal Ocean Current Monitoring Program (COCMP) which was initiated in December 2004 after the signing of the Grant Agreement. Initial planning efforts started in January included HF radar site planning, ocean modeling, and data management. After the approval of the Annual Work Plan on March 10th, 2005, SCCOOS began the process of establishing financial accounts, subawards, purchase orders, and related accounting paperwork necessary for financially tracking this complex Program.

The accounting infrastructure that resulted from the Plan’s approval also enabled the work described in the proposal. Subawards to partner UC campuses, UCLA and UCSB, were established on March 29, 2005 and subcontracts to USC and Cal Poly were issued on April 11, 2005. Towards the end of March, all participating SCCOOS partners received fiscal approval to begin their proposed work. As such, this first quarterly report is primarily focused on the initial planning activities and marks the beginning of regular operations.

For any additional information or questions, please contact me at (858) 822-4097 or via email, debbied@mpl.ucsd.edu, at your convenience.

Regards,

Debbie Duckworth
Grant Administrator
Coastal Ocean Currents Monitoring Program (COCMP)

First Quarterly Report
April, 2005

to

California State Conservancy
Sheila Semans
Program manager
Task A. HF Radar.

1. The majority of effort this quarter focused on site assessment and planning. SCCOOS established a surface current mapping working group for site assessment consisting of Principle Investigators (PIs) and senior technical staff. The working group conducted conference calls to review potential installation sites and system specifications.

2. Collaborating PIs prioritized a list of installation sites for their sub regions, including the L.A. basin. This list will be helpful in realizing commonality that may exist between agency land owners. For example, PIs from both regions commenced coordination of potential sites on USCG property and consolidated a 12 site work plan for proposal. A meeting with west coast USCG personnel is scheduled for May 3, 2005.

3. In order to facilitate planning efforts throughout the region, development effort went into a site management tool, which will allow PIs and technical staff to evaluate sites throughout the SCCOOS region. Features include editable site information, operator and landowner contacts, and image upload for site assessment and review. The management tool can be found at http://sccoos.org/SoCal.

Figure 1. Front page of SCCOOS site assessment and management tool.
4. Collaborating PIs designed a SCCOOS Surface Current Mapping System informational package detailing system specifications and components. The package is designed as a permissions and informational tool for site owners during assessment trips.

5. In an effort to streamline and expedite FCC frequency allocations, collaborating PIs determined current and necessary operational frequencies. SCCOOS plans to submit a collaborative allocation plan expanding upon an existing SIO permit. The SCM array will also utilize established frequencies, taking advantage of GPS synchronization to ensure seamless operation.

6. As the assessment and installation of SCM sites progresses, the focused effort will be on identifying equipment order needs and procurement. Drawing on experience and community input through operator suggestions and informational exchanges, technicians are able to construct essential equipment lists. Next, supporting field and fabrication equipment for the SCM antennas will be purchased.

7. A new HF radar site was installed at Summerland, CA, south of Santa Barbara. This radar was established with other funding, but is nonetheless a part of the COCMP radar network.
8. USC obtained permission for placement of HF ocean current mapping systems at three additional sites in the Los Angeles/Orange County region. Two of these sites are considered probably good sites, however, the third site may prove to be less desirable and may need to be changed. Other potential HF Radar sites were researched and are now in various stages of negotiation regarding use of certain facilities for placement of the CODAR equipment.

9. USC advertised for, interviewed and hired technician for HF radar sites. The resulting new employee, Matthew Ragan, has a M.S. degree in Ocean Science and was hired February 15, 2005. UCSB initiated the hiring process for a HF radar technician entailing a state announcement for employment.

Collaborating PIs: Mark Moline (Cal Poly), Burt Jones (USC), Libe Washburn (UCSB), Eric Terrill (SIO)

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**Task B. Nearshore & Surfzone Observations.**

**TASK B1. Wave and Current Observations to Calibrate Surfzone Current Models.**

1. Bob Guza and Burt Jones created outreach materials and distributed them for attendees at the Orange County Stakeholders Meeting on April 12. There, they described the work being done in San Pedro. Local and nearby sanitation districts, water resource managers, city lifeguards, watershed and coastal resources management attended.

2. Bob Guza and Falk Feddersen (SIO) researched and compared commercially available surfzone drifter components for cost and capabilities. A requisition for drifter components is in process.

**TASK B2. Transition Zone Observations – AUVs, Moorings and Drifters.**

1. UCSB researched commercial vendors and obtained quotes for necessary field instrumentation.

2. Carter Ohlmann (UCSB) began planning the exact time and location of the near-shore sampling.

3. Carter Ohlmann briefed Mr. Ireson, a technician, on the project.

**TASK B3. Nearshore & Surfzone Observations: Modeling Wave Evolution and Nowcasting Surfzone Currents.**

1. Collaborating PIs integrated NOAA Buoy 46086 data (San Clemente Basin) into the Coastal Data Information Program archive system for use with the nearshore wave model.

2. Collaborating PIs developed methods to concurrently use multiple buoys to predict nearshore sea and swell conditions in Southern California.

**TASK B4. Nearshore & Surfzone Observations: Nearshore Wave prediction for Northern & Central CA.**
1. Bob Guza, Falk Feddersen and William O’Reilly (SIO) integrated NOAA Buoy 46042 data (Monterey Bay) into the Coastal Data Information Program archive system for use with the nearshore wave model.
2. Collaborating PIs attended the National Data Buoy Center to discuss future deepwater directional wave measurements in Central and Northern CA.
3. Bob Guza, Falk Feddersen and William O’Reilly performed initial validation tests of the wave model in Monterey Bay in coordination with a Naval Postgraduate School student cruise.

NEARSHORE STUDY PLANNING
1. Burt Jones (USC) and Bob Guza (SIO) organized a stakeholders meeting for the Nearshore Observation and Prediction Study in San Pedro Bay. The meeting was held April 12, 2005. George Robertson hosted the meeting at the Orange County Sanitation District Plant in Fountain Valley.
2. Burt Jones presented a SCCOOS update and discussed the Nearshore Observation and Prediction Study to the SCCWRP CTAG on February 24, 2005.

Collaborating PIs: Bob Guza (SIO), Falk Feddersen (SIO), Mark Moline (Cal Poly), Carter Ohlmann (UCSB), Dan Rudnick (SIO), William O’Reilly (SIO)

Task C. Subsurface Observations.

Task C1. Two Bight-Scale Sections Using an Underway CTD.

Notably, funding was cut, so UCSB cut the number of bight-scale u/w CTD sections down to one. The section from Long Beach Harbor to Catalina Island has been selected for long-term deployment of the underway CTD.

Libe Washburn (UCSB) and Burt Jones (USC) planned the logistics of conducting underway CTD operations. These investigators will also work with Robert Guza to coordinate underway CTD sampling in support of the San Pedro Bay Experiment scheduled for 2006. Next, collaborating PIs will plan delivery schedule for the equipment.


1. Russ Davis (SIO) researched and ordered parts to construct three Spray gliders for operation scheduled in the second grant year.
2. Work on a web-based data system to display data from each glider is underway.

Collaborating PIs: Russ Davis (SIO), Libe Washburn (UCSB)
Task D. Regional Ocean Modeling.

Task D1. UCLA Model Research with Focus on Nearshore.

1. The UCLA group is designing the linux computer cluster to purchase and install. They successfully found a location with security, power, and cooling for the cluster with UCLA's Academic Computing Services.
2. Dr. Charles Dong in the Institute of Geophysics and Planetary Physics is working with Prof. McWilliams on the Regional Ocean Modeling System (ROMS) nearshore model development.

Task D2. High Resolution Wind Product for ROMS Use.

1. UCLA advertised for and hired two post-graduate researchers.
2. Dr. Gretchen Mullendore is working with Prof. Alex Hall in UCLA's Department of Atmospheric and Oceanic Sciences on the wind project.

Task D3. Covariances and Objective Mapping or HF Radar & Direct Observations.

1. CODAR mapping was begun, entailing: (1) estimating the wind-driven component by correlation with La Jolla and Tijuana wind data; (2) estimating the tidally-driven components (K1 and M2); (3) splitting the remaining current variability into 4 parts: low frequency (longer than 2 days, about), a band around 1 cycle/day, a band around 2 cycles/day, and the residual; and (4) spatial covariance for each of these fields has been estimated and used them to map the CODAR to a complete grid (no gaps) during a 2-month period of good data, and have used these currents to estimate particle trajectories. The resulting rough version will now be refined and data quality controlled.
2. Collaborating PIs started seasonal cycle simulations using the 4-level nested model validated against the satellite surface observations and CalCOFI data.
3. Raytheon and JPL began assembling various observational data sets for model validations and eventual data assimilation from other consortium PIs.
   To validate data, collaborating PIs systematically compared the ROMS tidal simulation against the tide gauge sea level measurements at about a dozen locations along the California coast and the ROMS baroclinic tidal solutions against the HF radar data. Initial findings follow in Figs. 3-6.
Figure 3. The location of Tide Gauge Stations.
Fig 5. Tide Analysis of ROMS for Monterey Point using eight constituents.
4. Next, collaborating PIs will compare the ROMS baroclinic tidal solutions against the HF radar data and make seasonal cycle simulations using the 4-level nested model validated against the satellite surface observations and CalCOFI data.

5. Raytheon placed an employment advertisement on their web site and since then, about 15 resumes were reviewed, and three were selected for interview. The new hire is anticipated to begin technical work as proposed in May if not sooner.

Collaborating PIs: Jim McWilliams (UCLA), Bruce Cornuelle (SIO), Yi Chao (JPL)

Task E. Data Distribution and Data Management.

Tasks E1 and E2.

Information Technology for HF Radar & Data Management, Quality Control and User Interface.

1. SIO established an initial data management working group aggregating expertise initially from within SIO. This SCCOOS data management team has begun by surveying existing data systems detailing data acquisition, transfer, storage, and access.

2. Antelope software, which includes Datascope for data storage and ORB (object ring buffer) technology for data transfer, will comprise the foundation of data distribution and
management for the near real-time SCM array. Historical data sets and in-situ measurements other than SCM will be stored in SQL databases. Data management efforts require development of a sensible and encompassing database schema for ease of acquisition, storage, and retrieval. The data management team is architecting the database schema to incorporate flexibility for varying data streams, and considering data delivery versions in preparation for a distributed near real-time SCM array. Historical data sets and in-situ measurements other than SCM will be stored in mySQL databases. Data management efforts point toward development of a sensible and encompassing database schema for ease of acquisition, storage, and retrieval. The database team is making a concerted effort to architect the database schema to incorporate flexibility for varying data streams.

3. In preparation for a distributed near real-time SCM array, the team is required to pay detailed attention to data delivery versions. Currently, several working file format variations for the SCM exist, increasing difficulty in maintaining robust transfer and ingestion. Due to the need to understand possible varying formats, the members of the team have detailed file format revisions in a white paper. These efforts will significantly increase the robustness of the distribution system.

4. In order to develop sensible data products and delivery method, the team feels it is beneficial to assay classes of SCCOOS end users. Users can be classified into several groups requiring varied level of access and detail to data. While modelers and researchers may require the ability to search and download raw datasets, public users are more interested in real-time digestible products.

Collaborating PIs: Frank Vernon (SIO), John Orcutt (SIO), Eric Terrill (SIO)

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Financial Summary

Spending during the first quarter was limited to a few technical working groups of primarily SIO researchers. Longer delays in establishing accounts were experienced by collaborating U.C. campuses, UCLA and UCSB, and the sub-awardees, Cal Poly and USC.

This quarter’s spending also corresponds almost entirely to initial planning activities that were permitted prior to the approval of the Annual Work Plan. Please see Table 1, below, for specific spending per task and Principle Investigator between January 1, 2005 and March 31, 2005. In summary, a total of $73,101 has been spent to support: (1) HF radar planning activities in the amount of $39,892; (2) data management planning for $20,949; and (3) program administration and coordination for $12,259. Of the $73,101 spent, $10,083 comprises indirect cost, which falls within the negotiated 20% limit for Indirect Cost Rate and will vary somewhat due to the various rates by collaborating institutions.
## Table 1  Project Spending Summary by Task - Year 1, First Quarter.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Project Tasks</th>
<th>Sub-Task ID</th>
<th>Project Sub-Tasks</th>
<th>Participating Institution</th>
<th>Total Allocation for Year 1</th>
<th>Total Spending from: January 01, 2005 through March 31, 2005</th>
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<tr>
<td>A</td>
<td>HF Radar</td>
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<td>Short-Medium-Range Resolution/Long-Range HF Radars</td>
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**Overall Total:** $11,443,566 $73,101