

Proposal Cover Sheet

Title: Central California Ocean Observing System (CenCOOS)
Leadership in Coordination of Ocean Observing

Submitted to: Director's Office (DO) Program – Coastal Observing System Support

Type of Project: Regional Observation System Coordination

Second Year Funding Request: \$110,941.00

Contact information for Principal Investigators:

Primary Co-PI and Financial Representative:

Marcia McNutt, President and CEO, Monterey Bay Aquarium Research Institute

Additional Co-PI's:

Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz

Lora Lee Martin, Director, UC MBEST Center, UC Santa Cruz

Signature of Submitter: _____

Project Summary

This second year funding request, submitted by the Monterey Bay Aquarium Research Institute on behalf of the Monterey Bay Crescent Ocean Consortium (MBCORC – an informal association of over 20 institutions) and our proposal partners, seeks funding to expand the work previously proposed by CenCOOS, and subsequently granted, into a second year of activity. The funding will be used in year two to expand and continue focused regional coordination of ocean observing activities in central and northern California. Specifically, this effort will enhance the organization, implementation and application of existing and planned regional coastal observing system efforts along 625 miles of California’s coast from Humboldt Bay on the north to Avila on the south. The exploration of a more formal Regional Association structure will be included in year two activities to be consistent with the Ocean.US plan for an Integrated Ocean Observing System. Expansion of this effort into year two was both planned for in our original proposal and comes in response to the recommendation of the proposal reviewers as forwarded to us by Geno Olmi, NOAA, on July 10, 2003 (Attachment A). In those recommendations the reviewers noted that three years of work was being forced into one year of funding. This request for second year funding allows the proposers to more effectively develop the regional coordination and to gain important traction for sustainability and expansion of coastal ocean observing activities.

Background

California is the most populated state in the nation with 75% of its population living within 50 miles of the coastline. It is also a very coastally dependent state with five major ocean industries alone contributing nearly \$20 billion to the state’s economy annually. The northern and central California region is an exciting environment for ocean observing.

Dynamics of the coastal ocean in this region are influenced by coastal upwelling, mesoscale variability associated with California Current System processes, and large-scale variability due to ENSO and longer-term multi-decadal cycles. These factors interact to produce a highly productive coastal environment which is now the center of the nation's largest National Marine Sanctuary, and home to a collaborative group of public, private, federal and state marine institutions and agencies. A number of these institutions have been developing, maintaining, and operating coastal observing systems, delivering data in near real-time, for almost 15 years. These efforts began with individual institutions, but over the last 10 years have become interdisciplinary and increasingly multi-institutional (Table 1).

The central and northern regions of the California coast are unique in having a large number of federal, state, and private institutions with sustained efforts in ocean monitoring. The large number of organizations involved has brought a rich mixture of approaches, technologies, data types, and funding sources to ocean observing (Table 1), all of which provide a strong basis for building and maintaining a highly capable regional system responsive to the needs of a large number of stakeholders. However, the diversity of the large number of small to medium-sized research organizations has also served as an impediment to coordination, despite a strong desire on the part of the regional organizations to work together in order to achieve far more than is possible through independent efforts. Furthermore, continued proliferation of small, disconnected ocean observing programs, regardless of how excellent each is in isolation, will hinder the ability of the California efforts from contributing to the broad and ambitious goals of Oceans.US, the Integrated Ocean Observing System (IOOS), the Global Ocean Observing System (GOOS), and California's new Coastal Conservancy Observing Initiative.

Table 1: Sample of CenCOOS Ocean Observing Activities

Historical time series data, 1929-present: Hydrographic data from historical Monterey Bay stations provide climatologies and decade-scale trends. The time series is maintained and extended through the efforts of Hopkins Marine Station (HMS), California Cooperative Fisheries Investigations (CalCOFI), Moss Landing Marine Labs (MLML), Naval Postgraduate School (NPS), Monterey Bay Aquarium Research Institute (MBARI), University of California at Santa Cruz (UCSC).

Mooring and shipboard Monterey Bay time series, 1989-present: Annual and ENSO variability is being documented with bio-optical, physical, and meteorological, chemical and biological time series data from both mooring and shipboard programs ("M" stations). MBARI maintains the time series, with funding from the David and Lucile Packard Foundation.

Wind-to-Whales shipboard time series, 1997-present: Trophic level connections are explored with physical, chemical and biological time series data within Monterey Bay through this effort led by UCSC and MLML.

Line 67 time series cruises, 1997-present: Annual and ENSO variability of the California Current system is examined with biological, chemical and physical measurements along CalCOFI Line 67 to 275 km offshore through a joint effort between the NPS and MBARI.

Juvenile rockfish surveys, 1985-present: The National Marine Fisheries Service (NMFS) examines larval and juvenile rockfish distributions with springtime CTD and trawl surveys from Bodega Bay to Point Sur.

Acoustic array, late 1980's-2000: The U.S. Navy monitors low frequency ocean acoustic signals off Point Sur, with plans for future acoustic and oceanographic measurements.

HF Radar, 1994-present: Improvements to HF radar hardware and software allow examination of circulation in Monterey Bay. This effort is led by NPS and California State University at Monterey Bay (CSUMB).

Monterey Accelerated Research System (MARS), 2002-present: NSF has funded MBARI to install a fiber-optic underwater observatory to serve as a national facility for testing new instruments, deployment protocols, and experimental procedures for using cabled underwater observatories. MARS will provide high power and high bandwidth for research in deep Monterey Bay waters. Installation is expected in 2005.

Autonomous Ocean Sampling Network (AOSN), 2002-present: This Navy-funded effort is developing a real-time adaptive and predictive observational/modeling system using autonomous mobile assets in Monterey Bay and contiguous water of the California Current. MBARI leads 10 institutions in this project.

Center for Integrated Marine Technology (CIMT), 2002-present: This NOAA-Coastal Observation Technology (COTS) project will combine emerging technologies to analyze the processes underlying coastal upwelling dynamics along the California coast and develop protocols for integrating and visualizing data by managers. UCSC leads the effort, which includes NPS, MBARI, MLML, NMFS, and MBNMS.
<http://cimt.ucsc.edu/siteNew/>

Innovative Coastal-Ocean Observing Network (ICON), 1998-2000: This NOPP-funded project supported a partnership to observe coastal oceanographic data, retrieve the data in near-real time, assimilate the data into coastal models, and predict future states of the system. The acquisition network included moorings, acoustic tomography, satellite temperature and color, HF radar, and shipboard surveys. NPS, MBARI, CSUMB, Hobi Labs, and 4 other partners. <http://www.oc.nps.navy.mil/~icon/>

Simulations of Coastal Ocean Physics and Ecosystems (SCOPE), 2000-present: The goal of this ICON-follow-up, also funded by NOPP, is to provide high spatial and temporal resolution modeling of the coastal upwelling ecosystem within the MBNMS. The model incorporates interconnected physical, chemical, and biological processes and assimilates data from real time sensors. This MBARI-led effort includes the MBNMS, NPS, JPL, UCLA, UCSC, NRL, Hobi Labs, and several other partners.
<http://www.mbari.org/bog/nopp>

Center for Integrative Coastal Observation, Research and Education (CI-CORE), 2002-present: With funding from NOAA-COTS, a consortium of California State Universities is establishing an observatory distributed along the entire 1200 miles of California coastline. This observatory will help address a variety of challenges to coastal environmental quality, including watershed alteration, erosion, chemical contamination, depletion of fish stocks, toxic plankton blooms, marine-borne pathogens, and non-indigenous species. <http://www.mlml.calstate.edu/cicore/index.html>

Alliance for Coastal Technologies (ACT): This program, sponsored by NOAA-COTS, is developing and applying sensor technologies for monitoring coastal environments. MLML and MBARI together are one of the 5 partner institutions, and the only ones on the West Coast. <http://www.actonline.ws/>

Network for Environmental Observations of the Coastal Ocean (NEOCO), 2001-present: The University of California has sponsored a two-year effort to monitor coastal conditions with remotely

operated sensor packages deployed on piers extending 700 km along the coast from Bodega Bay to La Jolla. UCSC is one of 7 UC partners. <http://www.es.ucsc.edu/~neoco/>

Sanctuary Integrated Monitoring Network (SIMoN), 1999-present: The specific goals of SIMoN are to integrate existing monitoring conducted in the MBNMS, initiate basic surveys of habitats of the MBNMS, establish long-term or targeted monitoring efforts to fill in critical gaps, and provide timely and pertinent information to managers and decision makers, the research community, and the general public. The SIMoN web site is intended to serve as a portal for many end users of results from many ocean observing activities in the central California region. Funding for SIMoN is supplied by NOAA, the Packard Foundation, and Duke Energy. <http://www.mbnms.nos.noaa.gov/research/simon.html>

Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO): With funding from the David and Lucile Packard Foundation, this project integrates long-term monitoring of ecological and oceanographic processes at dozens of coastal sites with experimental work in the lab and field. PISCO's results are applied to issues of ocean conservation and management, and are shared through public outreach and student training programs. Led by Oregon State University, UCSC and HMS are partners. <http://piscoweb.org/index.html>

Tagging of Pacific Pelagics (TPP): Marine biologists from HMS are using archiving tags attached to pelagic nekton and birds in the North Pacific to learn how they use the ocean environment. The project is funded by the Census of Marine Life.

Rapid Environmental Assessment Laboratory (REAL), 1999-present: NPS is developing a research and teaching laboratory focused on long-term, cross-shelf wave observations, bottom boundary/bedform measurements, and inner shelf current measurements. <http://www.oc.nps.navy.mil/~stanton/miso/>

PACJET: This NOAA-sponsored project is testing the use of new observing systems to understand Pacific land-falling storms and generate products to aid National Weather Service (NWS) forecasters in improving rainfall and runoff predictions.

In recognition of the value of coordination, more than two dozen institutions centered around Monterey Bay, formed MBCORC (Monterey Bay Crescent Ocean Research Consortium, Table 2) in 1998 for the purpose of improving collaboration and communication to promote ocean research and education in central California. Through regular meetings, the leaders of the MBCORC institutions have become more familiar with each institution's mission, current research activities, and future plans. They have worked to remove organizational and institutional barriers to collaboration, and encouraged joint projects between their institutions. Representatives from the MBCORC institutions helped pull together a compendium of ocean observing activities, both historical and ongoing, that provided the basis for the Monterey Bay National Marine Sanctuary's monitoring plan (SIMoN, Table 1). The leaders of the institutions also met in a two-day retreat to explore potential topics in research and education that might warrant MBCORC-wide collaboration. Ocean observing systems quickly came to the top of the list as an activity that would greatly benefit from wider coordination. While funding for observing activities was in relatively good shape, no single ocean observing project had the spare resources or the mandate to provide coordination of all activities throughout the

central and northern California area. Therefore, a commitment was made at that retreat to look for opportunities to raise the funds necessary so that the institutions could devote at least a full-time person to the process of coordination.

In preparation for Ocean.US regional planning workshops, the members of MBCORC had the opportunity to explore with other institutions outside the Monterey Bay region, but within northern and central California, their willingness to participate in regional coordination for ocean observing. Institutions from as far south as California Polytechnic University in San Luis Obispo and as far north as Humboldt State University agreed that it made scientific and logistical sense to combine our activities into a single central and northern California ocean observing system: CenCOOS. Therefore, the year one request for support for regional coordination was submitted on behalf of a much larger group of institutions listed in Table 2.

At the time of formation, it made sense to the CenCOOS members not to attempt to include southern California in our proposal for coordination. The oceanographic regimes north and south of Pt. Conception are quite distinct, and many of the ocean health issues must be addressed using different approaches and technologies. However, we will make it the responsibility of the CenCOOS coordinator to work with his or her counterpart in southern California to seek areas for coordination and consistent protocols.

Overall, the granting of year one funding to initiate more formal CenCOOS coordination has been a critical step in leveraging the talent of a robust region of cutting-edge research expertise to focus our collective efforts in a way that supports the ambitious and important goals of Oceans.US, the Integrated Ocean Observing System (IOOS), and the Global Ocean Observing System (GOOS). Expansion of this funding into year two will be important to help build enough institutional infrastructure to effectively maintain the effort and to accelerate the regional observing node evolution to provide maximum value to the national observing backbone.

Table 2: CenCOOS Partners (*italics indicates MBCORC members*)

- *California State University, Monterey Bay (CSUMB)*

- California State University, San Francisco (CSUSF)
- California Polytechnic State University San Luis Obispo (CSUSLO)
- *Earth System Science and Policy Institute, CSUMB*
- *Elkhorn Slough National Estuarine Research Reserve*
- *Fleet Numerical Meteorology and Oceanography Center*
- *Hopkins Marine Station of Stanford University*
- Humboldt State University
- *Marine Pollution Studies Laboratory, CA Department of Fish & Game*
- *Marine Protected Areas Center, Science Institute, NOAA*
- *Marine Region Headquarters, CA Department of Fish & Game*
- *Marine Wildlife Veterinary Care & Research Center, CA Department of Fish & Game*
- *Monterey Bay Aquarium*
- *Monterey Bay Aquarium Research Institute*
- *Monterey Institute of International Studies*
- *Monterey Peninsula College, Marine Advanced Technology Education (MATE) Center*
- *Moss Landing Marine Laboratories*
- *National Weather Service*
- *Naval Postgraduate School*
- *Naval Research Laboratory - Marine Meteorology Division*
- *NOAA - Monterey Bay National Marine Sanctuary*
- *NOAA/NMFS Pacific Fisheries Environmental Laboratory*
- *NOAA/NMFS Santa Cruz (previously Tiburon) Laboratory*
- *UC Monterey Bay Education, Science, and Technology Center (MBEST)*
- *University of California, Santa Cruz (UCSC)*
- *University of California, Santa Cruz - Institute of Marine Sciences/Long Marine Lab*
- *University of California Sea Grant Extension Program*
- *U.S. Geological Survey, Pacific Science Center*
- *West Coast and Polar Regions Undersea Research Center, NOAA*

Year Two Proposal Components

This proposal expands the original project into year two activities to include:

- The Regional Ocean System Coordinator (ROSC) would continue work on the tasks of year one, and in particular expand the CenCOOS membership to include a greater variety of stakeholders, increase the number of programs coordinated, and facilitate interactions with other regional activities along the west coast.
- The exploration of a more formal Regional Association structure will be included in year two by bringing together the directors all member institutions to discuss and, where appropriate, formalize our governance and operation. This will include looking at other

national models to assess organizational options that might be well suited for the CenCOOS effort.

- A critical component of this Association would be assembly of all of the data management supervisors in order to insure standardization of collection, processing, compilation and archiving of data. Though an important step has been initiated through the workshops and integration of the COTS institution, as well as via some of our existing regional collaborations (e.g. CIMT), what is needed now is to more fully integrate the efforts including incorporation of the additional institutions that this larger CenCOOS group will include.
- The ROSC would also organize a fall workshop that engages the federal and regional stakeholders to refine the CenCOOS approach and implementation steps.

Progress to Date on Year One funding



The project PI, Marcia McNutt, as chair of MBCORC, contacted representatives from all candidate institutions in the expanded region to determine their interest in participating in the first CenCOOS planning meeting. That meeting was held on September 2, 2003 and included representatives from all affiliated institutions and organizations. Rebecca Smyth of NOAA was asked to join the meeting as the NOAA appointed project manager. At the end of the meeting a subcommittee was established to refine a job description for the Regional Ocean System Coordinator (ROSC), a discussion of most effective outlets for recruiting, and a methodology for selection and interviewing was agreed upon. The finalized job description (Attachment B) was released and listed in late September in the CORE weekly newsletter as well as advertised in EOS. MBARI agreed to be the hiring entity and has managed the recruitment activities to date. As of October 24th, 2003, there were 28 respondents with credentials spanning from newly graduated marine science majors with Masters degrees, to experienced PhD scientists, to an academic oceanography department chair. Though a number of applicants are from within the

Monterey Bay Crescent region some have applied from the east coast of the US. On October 23rd the CenCOOS selection subcommittee convened by conference call and identified the top eight candidates for initial phone interviews, which took place during the week of October 27-31 in anticipation of personal interviews in early November. Hiring of the position is targeted to occur in November with the ROSC in place before January 1, 2004.

Benefits

By any measures, the ocean observing activities in central and northern California are of high quality and sustained. Some of the most innovative candidates for ocean sensors and novel observing platforms are being developed, tested, and deployed by CenCOOS institutions. Ideally, this region is an excellent candidate for a regional pilot project. However, the value of the central and northern California activities is compromised by the fact that they are not sufficiently integrated with each other, and with the needs of the end users. A small investment in the integration of these two areas is likely to reap large rewards in terms of the usefulness of ocean observing activities for resource managers, policy makers, researchers, and educators. The ROSC will be selected, hired and be on the job by January of 2004 and we anticipate that the benefits from having this regional coordination will soon begin to accrue. In the words of the reviewers for the Year one proposal, the initial proposal attempted to accomplish 3 years of work within a single year. We are in agreement and believe that the benefits of the CenCOOS coordination will require a sustained effort, well beyond a single year.

Specific benefits will be delineated during the development of the year one activities. However, the expectation is that this effort will provide relevant information about the marine environment to user groups such as the fishing industry, the tourism industry, the resource agencies, scientists, policy makers and others. With the help of the ROSC, input from these beneficiary groups will be key to fine tuning the type of information and the presentation format(s) that would be most effective, efficient, and relevant. We can imagine such information as climatic or pollution impacts on fisheries being an eventual resource over the CenCOOS network. The Monterey Bay National Marine Sanctuary's SIMON (Sanctuary Integrated Monitoring Network) is closely linked to CenCOOS and

on October 29, 2003, will formally open their web site, which will be the portal through which all user groups can access the ocean observing data being collected along the central coast. “The goal of SIMON is to gather and integrate existing monitoring information, implement new monitoring initiatives and communicate monitoring results to a broad audience”.

The support for the overall CenCOOS effort is broad and valuable as evidenced in the letters of support submitted with the first year funding proposal (Support Letters, Attachment C). This support continues in full force through active participation in the CenCOOS ROSC recruitment efforts currently underway. The community is ready to embrace the ROSC and help facilitate his or her success.

Goals, Objectives and Approach

Overall project goals, for both year one and year two would be as follows:

1. Prepare a position paper on the status of observing systems in central and northern California (including their funding status), how they do or should relate to each other, including an analysis of how we could truly combine these efforts into a regional system. What are the areas of synergy and overlap, and where are the gaps? Update and expand coverage of this document in year two so that it is current and relevant.
2. Meet with stakeholders in the region (CenCOOS members and others) to understand their needs in ocean observing and prepare a plan as to how to meet those needs most effectively, including a funding model. Expand the stakeholder participation in year two to a broader set of participants and to more fully engage them in determining relevant data capture and presentation formats for their needs.
3. Establish subcommittees from participating institutions to cover important aspects such as (1) technology, (2) data management, (3) educational outreach, (4) connections to policy makers, etc. Help organize meetings for those subcommittees within driving distance for the majority of members, with others participating via conference call. Meetings arranged by the ROSC in order to complete tasks 1 and 2 will help the ROSC determine which committees are needed. CenCOOS institutions should be asked to nominate staff members to serve on the committees. The

CenCOOS Executive Committee should give final approval to the recommendations from the ROSC.

4. Determine through conversations and interactive forums with NOAA representatives and others how the CenCOOS regional system can best interface with the national backbone.
5. Produce a long-term organizational plan for CenCOOS, by considering models ranging from a loose consortium to an incorporated entity.

Milestone Schedule

To effectively develop a sustainable and effective organizational structure this effort we continue to believe that this ramp up effort needs to continue for at least three years. Considering the number of observing programs underway and the amount of coastal ocean being monitored, the number of institutions and individuals involved, and the diversity and potential utility of the data being collected, eventually a permanent coordinator is needed. However, given the limit of one-year funding granted and this call for proposals for year two, (and the fact that many CenCOOS members are under severe budget constraints during the current economic downturn), we will only address the first two years of activities here in any detail. If limited to two years we would aggressively proceed as follows.

Year One

September-November 2003 – Recruit for ROSC position

December 2003 – Hire ROSC

January 2004, 2003 – Complete Task 1 above

March, 2004 – Complete Tasks 2 and 3 above

August, 2004 – Complete Tasks 4, 5, and 6 above and outline timeline for year two.

Year Two

The year two schedule would depend upon the start date of a positive determination of this request to NOAA, and the input of the ROSC hired in year one. Overall, in year two, the ROSC would continue throughout the year to work on the tasks noted above, and in particular expand the CenCOOS membership to include a greater variety of stakeholders, increase the number of programs coordinated, and facilitate interactions with other regional coordination activities along the west coast. The ROSC would be asked to organize a late Fall 2004 workshop that would engage the federal stakeholders to refine the CenCOOS approach and implementation steps. Work on identifying potential organizational structures and approaches would occur during this year to be completed mid-cycle.

Year Three

Year three would be devoted to implementation of the CenCOOS model and formalization of relationships with other regional coordination efforts.

Project Budget – Year 2

Again, we have made every attempt to maximize the availability of project funds to support the intended activity. The main budget item is the salary and employee benefits for a Regional Observation System Coordinator (ROSC); reflecting in year two a modest salary/benefits increase of 4% over year one levels. Note that given the very high calibre of many of the applicants for this position, we believe that the year one salary level is barely adequate given the high cost of living in California. A merit raise in year 2 would

be essential to retain this individual. Modest funding has been included for travel by within the region for meetings with members and report coordination and generation. The CenCOOS members, in their letters of support, have generously committed space for the ROSC, access to photocopying, phone, and office supplies, use of meeting and conference facilities, administrative support, and student assistants. In recognition of the fact that the many CenCOOS partners are contributing facilities for the ROSC, MBARI is only requesting its off-site overhead rate (6%) to help defray the costs of grant administration and human resource services.

Resumes**Marcia K. McNutt**

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5/73 B.A. in Physics from Colorado College, Colorado Springs, Colorado.
 1/78 Ph.D. in Earth Sciences from Scripps Institution of Oceanography, La Jolla, California. Dissertation title: Continental and Oceanic Isostasy.

Awards and Fellowships

1970 Class valedictorian, awards for mathematics, science and French.
 1970-1971 National Merit Scholarship
 1973 Phi Beta Kappa, summa cum laude
 1973-1976 National Science Foundation Graduate Fellowship
 1977-1978 University of California Dissertation Fellowship
 1984, 1993 *Journal of Geophysical Research* Editor's Citation for Excellence in Refereeing
 1985 Graduate Student Council Award for Teaching
 1985-1986 Mary Ingraham Bunting Fellow, Radcliffe College
 1988 Macelwane Award, American Geophysical Union
 1988 Doctor of Science, *honoris causa*, Colorado College
 1989-1990 NSF Visiting Professorship for Women, Lamont-Doherty Geological Observatory of Columbia University
 1993 Outstanding Alumni Award, The Blake Schools, Minneapolis
 1995 Capital Science Lecturer, Carnegie Institution
 1996-7 Phi Beta Kappa Visiting Scholar
 1996 MIT School of Science Graduate Teaching Prize
 1997 Science and Technology Fellow, CSU Monterey Bay
 1998 Elected member, American Academy of Arts and Sciences
 1998 Sanctuary Reflections Award, Monterey Bay National Marine Sanctuary
 2002 Elected member, American Philosophical Society
 2003 ARCS Scientist of the Year

Post-graduate Employment

1/78-6/78 Postdoctoral Research Associate, Scripps Institution of Oceanography.
 6/78-7/79 Visiting Assistant Professor, University of Minnesota, Minneapolis.
 6/79-6/82 Geophysicist, U.S. Geological Survey, Menlo Park, California.
 7/82-8/97 Assistant Professor, Associate Professor, Professor, and Griswold Professor of Geophysics, Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology.
 7/93-7/95 Associate Director, MIT SeaGrant College Program
 7/95-8/97 Director, MIT/WHOI Joint Program in Oceanography and Applied Ocean Science and Engineering
 9/97 President/CEO Monterey Bay Aquarium Research Institute
 6/98 Professor, Department of Earth Science, UC Santa Cruz (on leave)
 10/98 Professor of Geophysics, Stanford University

Sea Experience

Participant on 21 oceanographic expeditions (7 as chief scientist) on ships from Scripps, Woods Hole, Oregon State University, and Columbia University.

Professional Societies

American Geophysical Union (Fellow), American Association for the Advancement of Science (Fellow), Geological Society of America (Fellow)

Other Current Activities

Past President, American Geophysical Union 2002-4
 Chair, Ocean Research Advisory Panel, National Ocean Partnership Program, 2001-
 Member, Visiting Committee, Department of Ocean Engineering, MIT 1999-
 Member, Visiting Committee, School of Earth Sciences, Stanford University, 1999-
 Chair, Visiting Committee, Department of Earth and Planetary Science, Harvard
 University, 2002-
 Member, Board of Directors, Monterey Bay Aquarium, 1998-
 Chair, Advisory Committee, Keck Graduate Institute, 2000-
 Member, Schlumberger Technical Advisory Committee, 2000-
 Member, Exploration of the Seas Committee, National Research Council, 2001-
 Chair, Monterey Bay Crescent Ocean Research Consortium, 2000-

SELECTED RECENT PUBLICATIONS

- McNutt, M. K. and A. Bonneville, Mapping the seafloor from space, *Endeavour*, 20, 157-161, 1996.
- McNutt, M. K., Superswells, *Rev. Geophys.*, 36, 211-244, 1998.
- McNutt, M. K., Achievements in marine geology and geophysics, *in Fifty Years of Ocean Discovery*, National Academy Press, Washington, D.C., pp. 51-64, 1999.
- McNutt, M. K., The future of marine geology and geophysics: a summary, *in Fifty Years of Ocean Discovery*, National Academy Press, Washington, D.C., pp. 172-183, 1999.
- McNutt, M. K., Earth and Environmental Science, *in Frontiers of the Mind of the Twenty-first Century*, Library of Congress, 1999.
- McNutt, M. K. and R. D. Ballard, Two case studies of collaborations between aquariums and research institutions in exploration and education, *Mar. Tech. Soc. J.*, 35, 76-85, 2001.
- McNutt, M. K., Engineering the ocean, *in The Invisible Future: The Seamless Integration of Technology in Everyday Life*, P. Deming, ed., p. 27-42, McGraw-Hill, 2001.
- McNutt, M. K., Ocean exploration, *Oceanography*, 15, 112-121, 2002.

Gary B. Griggs
Professor-Department of Earth Sciences
Director-Institute of Marine Sciences
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University of California, Santa Cruz

Education

- 1965 B.A.- University of California, Santa Barbara (Geology)
- 1968 Ph.D.- Oregon State University, Corvallis (Oceanography)

Positions

- 1969-present-:Assistant to Full Professor of Earth Sciences, University of California, Santa Cruz
- 1981-84: Chairman of Department of Earth Sciences, U. C. Santa Cruz
- 1990- present: Editorial Board-*Journal of Coastal Research*
- 1991-present: Director-Institute of Marine Sciences, University of California, Santa Cruz
- 1995-present: Consortium for Oceanographic Research and Education: Member of Executive Committee and Governor, University of California Consortium and Central California consortium.
- 1998- Chair-California Sea Grant Program Review Committee
- 1999-present- Chair, University of California Marine Council
- 2002-present- California Sea Grant Advisory Committee

Honors and Awards

- 1966-1968 NSF Graduate Fellowship
- 1974-75 Fullbright Fellow- Institute of Oceanographic Research, Greece
- 1997-98- NAS-NRC Committee on Coastal Engineering Research & Education Needs
- 1998- University of California, Santa Cruz- Award for Outstanding Natural Sciences Faculty Member

Selected Publications

Griggs, G.B., 1994. CALIFORNIA'S COASTAL HAZARDS, *Journal of Coastal Research Special Issue No. 12*: 1-15.

Griggs, G.B., 1995. MONTEREY BAY, NATIONAL CENTER FOR MARINE SCIENCE. *SeaTechnology* 36:5: 43-53.

Griggs, G.B., Tait, J.F., Moore, L.J., Scott, K., Corona, W., and Pembroke, D. 1997. INTERACTION OF SEAWALLS AND BEACHES: EIGHT YEARS OF FIELD MONITORING, MONTEREY BAY, CALIFORNIA. U.S. Army Corps of Engineers, Waterways Experiment Station Contract Report CHL-97-1. 34p.

Griggs, G.B. and UCSC/USGS Coop., 1998. A COLLABORATIVE PROGRAM TO INVESTIGATE THE IMPACTS OF THE 1997-98 EL NINO WINTER ALONG THE CALIFORNIA COAST. *Shore and Beach* 66:3: 24-32.

Griggs, G.B., 1998. CALIFORNIA NEEDS A COASTAL HAZARDS POLICY. *California Coast and Ocean*. 14:3:30-33.

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Griggs, G.B. 1999. THE PROTECTION OF CALIFORNIA'S COAST: PAST, PRESENT AND FUTURE. *Shore and Beach* v. 67:1: 18-28.

Griggs, G.B. and others, 1999. MEETING RESEARCH AND EDUCATION NEEDS IN COASTAL ENGINEERING. National Academy Press, Wash. D.C. 62p.

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Storlazzi, C.D. and Griggs, G.B. 2000. THE INFLUENCE OF EL NINO-SOUTHERN OSCILLATION (ENSO) EVENTS ON THE EVOLUTION OF CENTRAL CALIFORNIA'S SHORELINE. *Geological Society of America Bull.* 112:2:236-249.

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Lora Lee Martin
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Education

University of California, Berkeley MBA 1979
University of California, Davis* B.S., Zoology 1976
(*Accepted into Veterinary School at UC Davis in 1982 but declined to attend)

Work Experience

1/90 to Present University of California, Santa Cruz

Director, UC MBEST Center Initiative 6/96 - present
Director, Government Research Affairs & Regional Economic Development 8/91-6/96
Director, Science Development 1/90-8/91
Responsible for a leadership role in conceptualizing and developing the UC Monterey Bay Education, Science, and Technology Center regional initiative.
Key responsibilities include:

- Initiate and manage programs and policies to catalyze the development of research related businesses and relationships including small and micro enterprise business.
- Develop networks and regional research collaborations between regional education and research institutions;
- Articulate and implement regional economic vision and marketing strategy;
- Develop and implement Federal, State, and local legislative and political strategies;
- Acquire and oversee the planning and development of 1100 acres at the former Fort Ord;
- Identify and acquire external financing for planning and implementation of regional initiative activities;

11/87-1/90 Organizing Institute/Services for Organizing & Leadership Pacific Grove, CA

Business Manager
9/85 -11/87 Management Consultant, Los Angeles, CA
5/83 -9/85 Natural Resources Defense Council (NRDC), Washington, DC
Development Coordinator
2/82-3/87 Friends of Robert C. Byrd Committee, Washington, DC
Assistant Treasurer
2/81 – 2/82 National Environmental Controls, Inc. , Washington, DC
Executive Assistant to the Chairman
10/79 - 2/81 Carter/Mondale Presidential Campaign, Washington, DC
Assistant to the National Treasurer
1980 The White House Advance Team (as needed basis), Washington, DC

Selected History of Memberships and Affiliations

- Monterey Bay Crescent Ocean Research Consortium (MBCORC) founding Board Member
- National Ocean Conference in Monterey 1998, Local advisory/organizing committee
- Camp SeaLab Monterey, Founding Board Member
- Friends of the Sea Otter, Past Board Member
- Association of Monterey Bay Governments TriCounty Economic Conference Advisor
- Fort Ord Reuse Authority (FORA) Board -founding UC representative, ex officio.
- Monterey Bay National Marine Sanctuary Interagency Task Force, Santa Cruz County
- Monterey Bay Futures Network –Past President and Founding Board member
- State of California' s Defense Conversion Council-past advisory member
- Western Governor's Association on Base Conversion; a participating observer for Munitions Working Group and Base Closure Working Group
- University of California ad hoc committee assessing the role of the University in regional economies
- International Economic Development Council (IEDC) –Member
- Association of University Research Parks (AURP) – Member
- Light House Venture Forum, Santa Cruz – sponsoring organizational member


Sample of Presentations

- Testimony to the Economic Development Subcommittee of the Committee on Public Works and Transportation of the U.S. House of Representatives -July 1993
- Recommendation to the Governor appointed California Military Base Reuse Task Force October 1993
- Presentation to the California Policy Seminar Annual Senate Fiscal Retreat "Federal and State Defense Conversion Activities and Prospects" -February 1994
- Speaker at the annual meeting of the American Association for the Advancement of Science (AAAS) -February 1994
- Association of Monterey Bay Government's (AMBAG's) Tri county Economic Summit, Panelist or Moderator for annual conferences for nearly a decade.
- Congressional testimony before the U.S. House of Representatives natural Resources Committee Hearing on "Managing Unexploded Ordnance on Federal Lands". –May 1994
- Panel presentation on economic development and the role of education and research to the Monterey County Economic Summit 1999
- Panel Presenter at numerous Association of University Research Park Conferences 1994-2003
- Panel organizer, Monterey Bay Crescent Research, GSCN VC Conference, Monterey, Ca 2002
- Speaker at the May 2003 Economic Development Summit (Department of Commerce), Washington DC
- Seminar Organizer and Presenter at June 2003 Global Alliance Conference (International Economic Development Council –IEDC) in Montreal, Canada
- Submitted as a panelist for an economic development panel proposed by DOD to NATO for an upcoming eastern European conference in 2003 (pending)

ATTACHMENT A: LETTER OF NOTIFICATION FROM NOAA

10 July 2003

To: Marcia McNutt
Monterey Bay Aquarium Research Institute

From: Geno Olmi 
Ecologist & Federal Program Officer

Subject: Application for Federal Assistance,
Support for Regional Coastal Observing System Development

Thank you for applying for funding under the NOAA Coastal Services Center's grant program for regional coastal observing system development. I am pleased to inform you that the Coastal Services Center (CSC) intends to recommend your proposal for funding.

The Coastal Services Center received twenty-one proposals in response to the announcement for availability of support for Regional Coastal Observing System Development. Each proposal was evaluated by a minimum of four reviewers. On 23-24 June, the CSC hosted a review panel to discuss the evaluations and to provide the CSC with a recommendation of which proposals to fund based on the announcement guidance, the evaluations, and the amount of funds available. In general, the panel favorably evaluated proposals that clearly articulated partners, roles and responsibilities, and a work plan that would significantly enhance development of a regional observing system.

Briefly, the main points regarding your proposal from the panel discussion were as follows:

Positives:

- Substantial list of partners
- Have some structure already in place through MB CORC efforts
- Well thought out and responsive to RFP

Negatives:

- May be forcing three years of work into one year
- End point not well defined
- Did not address data management issues very well

To the extent reasonable, please try to address the concerns of the panel in the implementation of the project.

Based on the recommendations of the panel, the Coastal Services Center has selected seven proposals (six coordination and one pilot) that we intend to forward to the NOAA Grants Management Division with our recommendation for funding. Your proposal is one of those that we intend to recommend. Please note that authority for final approval of award applications rests with the NOAA Grants Management Office. The CSC will work with you over the next 2 weeks to prepare a complete application package that must be submitted to the Grants Office by the end of the July.

Congratulations on submitting a proposal worthy of funding. The Coastal Services Center looks forward to working with you to further develop regional coastal observing systems in support of a national Integrated Ocean Observing System. If you have any questions regarding the specifics of your grant, please contact Rebecca Smyth at 415 904-5251 or Rebecca.Smyth@noaa.gov.

ATTACHMENT B: ROSC JOB DESCRIPTION**CenCOOS Regional Ocean System Coordinator**

The Monterey Bay Aquarium Research Institute (MBARI), acting on behalf of more than 30 organizations involved in ocean management, research and education in the northern and central California region, seeks to fill the position of Regional Ocean System Coordinator. The main responsibility of this coordinator will be to facilitate the establishment of a strong regional partnership and strategic business plan to support the development of an integrated and sustained Central California Ocean Observing System (CenCOOS).

In close coordination with member entities, specific tasks for the coordinator are anticipated to include:

1. Preparing a summary paper, based on existing documents and interviews, on the status of ocean observing systems operating in central and northern California, including areas of synergy, overlaps, gaps, and their funding mechanism and outlook.
2. Performing an analysis of how these efforts could be combined into a regional system. What elements would form the essential backbone of such a system? Where might savings be realized by avoiding duplication of effort?
3. Meeting with all stakeholders in the region (e.g., local, regional state and federal agencies, as well as other appropriate entities) to understand their needs in ocean observing, data access and products and to prepare a plan as to how to meet those needs most effectively, including a funding model.
4. Recommending how the CenCOOS regional system can best connect with other contiguous regional observing systems and the national backbone to be established by NOAA.
5. Facilitating the work and interaction of subcommittees from participating institutions to cover important aspects such as science, technology, data management, education, connections to policy makers, etc.
6. Drafting a long-term organizational plan for CenCOOS, by considering models ranging from a loose consortium to an incorporated entity.

7. Developing an integrated CenCOOS project management plan for the many observing efforts planned and underway.

The ideal candidate would possess the following:

- A bachelor's degree or equivalent experience in marine science, oceanography, or a related technical field; masters degree or higher is preferred.
- Significant experience in program or project management and familiarity with oceanographic research and federal research programs.
- Knowledge of marine policy issues affecting the west coast of North America.
- Ability to work independently and focus on results.
- Demonstrated skill in exerting leadership, through consensus building and compelling expression of concepts and principles.
- Technical and non-technical communication skills, including proposal preparation.
- Proficiency in developing and maintaining effective relations within a diverse regulatory and scientific community.

Position will be filled on a full or part-time basis for the period of one year. Continuation is dependent on availability of additional funding and job performance. Salary will be commensurate with qualifications and experience.

ATTACHMENT C: LETTERS OF SUPPORT