

Central California Ocean Observing System (CenCOOS)

Leadership in Coordination of Ocean Observing

Project Summary

The Monterey Bay Aquarium Research Institute requests, on behalf of the Monterey Bay Crescent Ocean Research Consortium (MBCORC) and our proposal partners, \$100K for the first year to initiate and support focused regional coordination of ocean observing activities in central and northern California. This effort, CenCOOS, is being proposed to strategically enhance the organization, implementation and application of existing and planned regional coastal observing system efforts along the California coast. In addition to the membership of MBCORC, the proposal partners extend north to Humboldt and south to San Luis Obispo, across 625 miles of California coastline. The CenCOOS effort will also initiate interaction and coordination with other coastal observing efforts (e.g. in Southern California) as the opportunity arises. This proposal seeks multiyear consideration of this coordinating effort but with the understanding that at this time only the first year of funding could be made available.

Background

The central and northern regions of the California coast are blessed with 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 mix 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 this large number of small- to medium-sized organizations has also served as an impediment to coordination, despite a very great will 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 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 Ocean Conservancy 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 Oceanic 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. NPS, MBARI, UCSC and NMFS have made plans to run line 67 quarterly beginning in 2004, and line 60 when resources become available. NMFS eventually hopes to fund running lines north of Point Reyes to the Oregon border.

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.

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 (TOPP): Marine biologists from five nations are using electronic tags attached to pelagic nekton and birds in the North Pacific to learn how they use the ocean environment. TOPP is a pilot program of the Census of Marine Life, with current funding from the Sloan Foundation, Packard Foundation, and Office of Naval Research.

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.

Physical Oceanographic Real Time System (PORTS): Now in its operational phase, PORTS is designed to provide crucial information in real time to mariners, oil spill response teams, managers of coastal resources, and others about San Francisco Bay's water levels, currents, salinity, and winds. In partnership with the NOAA's National Ocean Service (NOS); the California Office of Oil Spill Preparedness and Response (OSPR), the U.S. Geological Survey, and the local community, the Marine Exchange of the San Francisco Bay operates PORTS as a service to those who must make operational

decisions based on oceanographic and meteorological conditions in the Bay.

<http://sfbeams.sfsu.edu>

In recognition of the value of coordination, more than 2 dozen institutions centered around Monterey Bay formed an organization, MBCORC (Monterey Bay Crescent Ocean Research Consortium, Table 2) in 1998 for the purpose of improving communication and collaboration 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). In 2001 the leaders of the institutions also met in a 2-day retreat to explore potential topics in research and education that might be worthy of 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 one 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 planning retreat to look for opportunities to raise the funds necessary to support professional staff to catalyze 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 as to their willingness to participate in broader regional coordination for ocean observing. Institutions from as far south as California State Polytechnic University, San Luis Obispo and as far north as Humboldt State University agreed that it made scientific and logistical sense to join our activities into a single central and northern California ocean observing system spanning 625 miles of California coast: CenCOOS (Figure 1). Therefore, this request for support for regional coordination is being presented on behalf of a much larger group of institutions (see Table 2). Many of the CenCOOS institutions have already indicated their interest in collaboration and willingness to be coordinated as documented in the letters appended to this proposal. The U.S. Representative from California's 17th Congressional District, the Honorable Sam Farr, has also pledged his support for our efforts. Furthermore, we have no intention of being exclusive; as this project proceeds, CenCOOS will be receptive to new members willing to work with us in planning our coastal observing activities more strategically, including such diverse groups as water districts, energy providers, fishermen's associations, emergency response managers, etc.

This CenCoos proposal intentionally does not include the southern California area. The oceanographic regimes north and south of Pt. Conception are quite distinct, and many of the monitoring issues are best addressed using different approaches and technologies. For example, beaches dominate the southern California shore face, while the central and northern California coastline is dominated by rocks and cliffs. However, we will make it the responsibility of the CenCOOS coordinator to work with his or her counterpart in

southern California to seek areas of common interest so that over time, these two regions of California can better leverage the investment in coastal observing efforts.

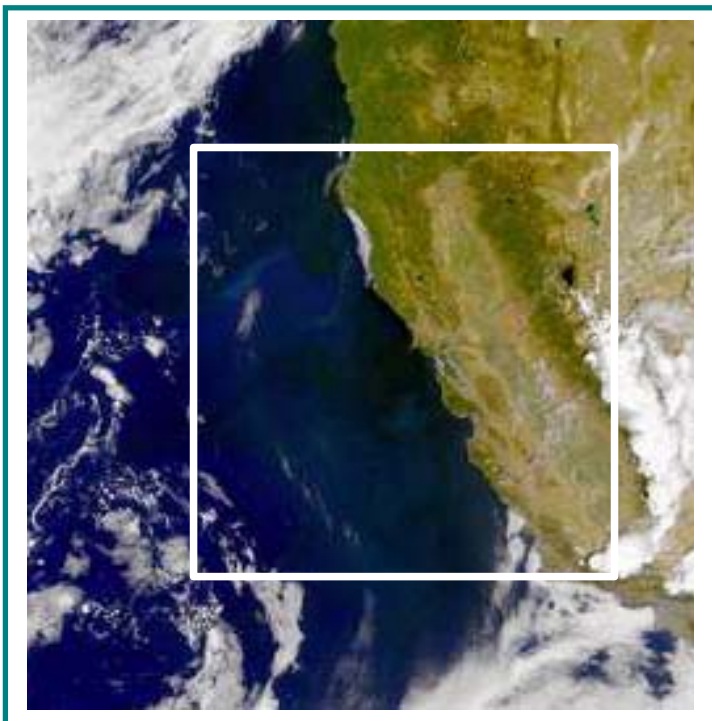


Figure 1. Approximate location of CenCOOS activities. From a logistical and oceanographic standpoint, there is no firm northern or western boundary to the region that could conceivably benefit from this coordination activity. Participants north of the California border would be welcomed.

Table 2: CenCOOS Members (italics indicates MBCORC members)

- *California State University, Monterey Bay (CSUMB)*
- 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*
- *Romberg Tiburon Center for Environmental Studies, SFSU*
- *San Francisco State University (SFSU)*
- *UC Monterey Bay Education, Science, and Technology Center (MBEST)*
- *University of California, Davis, Bodega Marine Laboratory (UCD-BML)*
- *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*
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Benefits

In order to meet the national needs of marine research, resource management, commerce, and homeland security, the participants at the Ocean.US workshop in March, 2002, identified the need to develop a sustained and integrated ocean observing system¹. For the coastal U.S., the ideal integrated coastal ocean observing system (ICOOS) is one that: 1) is based on sound science and modern technologies, 2) provides timely access to data, and 3) makes effective use of existing resources, knowledge, and expertise². Malone² proposed that an ICOOS initially develop through the establishment of regional proof-of-concept pilot projects that incorporate existing programs and new initiatives into a coordinated and integrated system.

Looking at a west-coast subset of this IOOS approach, the northern and central California region is an exciting environment for ocean observing. Dynamics of the coastal ocean in this region are controlled by coastal upwelling, mesoscale variability associated with California Current System processes, and large-scale physical and biological variability due to ENSO and longer-term multi-decadal cycles. The population dynamics of the valuable fishery resources of the region are largely driven by environmental factors that interact to produce a highly productive coastal environment. The central and northern California region now includes three National Marine Sanctuaries and is home to a collaborative group of public, private, federal and state marine institutions and agencies.

¹ "Building Consensus: Toward an Integrated and Sustained Ocean Observing System," Ocean.US Workshop Proceedings, Airlie House, Virginia, 2002.

² Malone, T.S., 2001. The coastal component of the U.S. Integrated Ocean Observing System. U.S. Program Document. <http://www.ocean.us/documents/EMAP-2001-paper.pdf>

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).

By any measure, 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 (Table 1). In addition to internal NOAA programs, NOAA funding is supporting CI-CORE and CIMT programs that will be key to our CenCOOS effort. Because of these investments, the wealth of expertise and diverse partners, and the specific scientific opportunities, this region is an excellent candidate for a regional pilot project that will integrate and leverage our many efforts. A coordinating effort for CenCOOS as proposed here can ensure that we move forward in a more strategic and integrated way, and with the needs of the end users in mind. A small investment in integration is likely to reap large rewards in terms of

- increased efficiencies of the existing research projects and data collection,
- more integrated approaches as our efforts move forward, and
- enhanced utility of ocean observing activities for resource managers, policy makers, researchers, and educators.

Project Description

With funding provided by NOAA we would proceed with the process of coordinating and integrating the ocean observing activities in central and northern California as follows.

The project PI, Marcia McNutt, as chair of MBCORC, along with her Co-PI's, Gary

Griggs and Lora Martin, will contact representatives from all candidate institutions in the region to determine their interest in participating in CenCOOS. Each participating institution will be asked to designate a representative to CenCOOS. In the case of MBCORC institutions, the representative may be the MBCORC representative, or it may be some other staff member directly involved in designing or operating ocean observing systems, or in using the data or data products from such systems.

Because CenCOOS is likely to be a relatively large body, it will be necessary to find some more efficient mechanism to conduct business matters, such as selecting the CenCOOS Regional Ocean System Coordinator (ROSC). It will be first responsibility of CenCOOS to formalize an operating process. For example, the CenCOOS representatives might decide to nominate from among themselves and elect an Executive Committee (EC) consisting of some small number of members (e.g., 5 or 6). Every attempt should be made to ensure geographic and disciplinary diversity on the Executive Committee. Once the Executive Committee is selected, the representatives could vote on a chair and vice chair from among the EC members. The members of the EC would serve for some fixed time period, at which time there will be another election.

The task of selecting the CenCOOS ROSC would then fall on the EC. With input from the EC, MBARI, as the hiring entity, would finalize a position description and advertise for the job. The CenCOOS EC, augmented by the project PI, would then interview candidates and select the best one for the position. The EC and the project PI would be responsible for oversight and direction for the ROSC. Reports and other products from the ROSC would be delivered to the CenCOOS EC for presentation and distribution to the members. MBARI has the flexibility either to hire the coordinator directly, or to transfer salary funds to another institution should the top candidate be already employed

elsewhere. We are very fortunate that several excellent individuals already familiar with the CenCOOS institutions and with ocean observing have already expressed interest in this position.

The following is a sample of the qualities and qualifications that we would be seeking in the CenCOOS coordinator:

- A bachelor's degree or equivalent experience in marine science, oceanography, or a related technical field; masters degree or higher is preferred.
- A minimum of 5 years experience in program management, and demonstrated familiarity with oceanographic research and federal research programs.
- Demonstrated familiarity with marine policy issues.
- Demonstrated skill in exerting leadership, through consensus building and compelling expression of concepts and principles.
- Demonstrated technical and non-technical communication skills.
- Demonstrated skill in writing successful proposals for complex technical endeavors.
- Demonstrated skill in managing budgets.
- Demonstrated skill in developing and maintaining effective relations within a diverse scientific community.

Goals and Objectives

Initial tasks for the ROSC would be as follows:

1. Prepare a summary paper on the status of observing systems (including their funding status), how they do or should relate to each other, and 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? The existing SIMoN document will be

an excellent starting point for this report, with expansion and updating that the CenCOOS effort can provide.

2. Meet with all 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.
3. Establish subcommittees from participating institutions to cover important aspects such as technology, data management, education, 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 EC should give final approval to the recommendations from the ROSC.
4. Determine through conversations with NOAA representatives how the CenCOOS regional system can best connect 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.
6. Present an integrated CenCOOS project plan for the many observing efforts planned and underway.

Milestone Schedule

To effectively develop a sustainable and effective organizational structure this effort would need to continue for at least three years. However, given the limit of one-year funding in this call for proposals and the fact that many CenCOOS members are under severe budget constraints, we can only address the first year of activities here. If limited

to one year we would aggressively proceed as follows, assuming a positive decision on this proposal in August of 2003 and funds in hand in September, 2003. The timeline would be adjusted if these dates were to change.

Year One

August 2003 – Advertise ROSC position

September, 2003 – Hire ROSC

December, 2003 – Complete Task 1 above

March, 2004 – Complete Tasks 2 and 3 above

August, 2004 – Complete Tasks 4, 5, and 6 above.

Years Two and Three

In year two, the ROSC would continue 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 fall workshop that engages the federal stakeholders to refine the CenCOOS approach and implementation steps. Year three would be devoted to the final implementation of the CenCOOS model and formalization of relationships with other regional coordination efforts.

Project Budget

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). We have also included a laptop computer for use by the ROSC in communications, taking notes, and preparing reports. Modest funding has been included for travel by private automobile 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.

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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.

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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
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 Fulbright 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.

Moore, L.J., Benumof, B.T. and Griggs, G.B., 1999. COASTAL EROSION HAZARDS IN SANTA CRUZ AND SAN DIEGO COUNTIES, CALIFORNIA. Journal of Coastal Research, Special Issue 28:121-139.

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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)