This document is a contribution of the Moorea Coral Reef LTER (OCE 04-17412)

June 8, 2007
Volume II. Appendices

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Appendix I. MCR Publications

JOURNAL PUBLICATIONS

In Press


In Revision


In Review


Gamino-Padilla, J.L. and R.C. Carpenter. Seasonal acclimatization of *Asparagopsis taxiformis* from different biogeographic regions. Limnology and Oceanography, In Review.


Morrow, K. and R.C. Carpenter. Effects of macroalgal thallus morphology on rates of particle capture by the Corallimorpharian *Corynactis californica*. Marine Biology, In Review.

2007


2006


2005


BOOK CONTRIBUTIONS

In Press

2007
DISSERTATIONS AND THESES

2006
Talmage, S. 2006. Variation in abundance and carbon allocation for *Sargassum mangarevense* across gradients in herbivory and hydrodynamic exposure in Moorea, French Polynesia. MS Thesis, California State University, Northridge, CA.

Elahi, R. 2006. The interactive effects of age and size in determining phenotypic plasticity in reef corals. MS Thesis, California State University, Northridge, CA.


2005
Appendix II. MCR Presentations

2007


Bernardi, G. and S. Planes. 'Population connectivity in the orange-fin anemonefish.' Scientific Roundtable Meeting between the MCR LTER, CRIOBE (Centre de Recherches Insulaires et Observatoire de l'Environnement) and the Richard B. Gump Biological Research Station, Santa Barbara, CA, March, 2007.


Schmitt, R. 'Recent advances arising from MCR LTER and CRIOBE collaborative research.' Scientific Roundtable Meeting between the MCR LTER, CRIOBE (Centre de Recherches Insulaires et Observatoire
Adam, T. ‘Do adult cleaners facilitate recruits at cleaner stations?’ Poster Presentation. Moorea Coral Reef LTER All-Scientists Meeting, University of California, Santa Barbara, CA, November 14-16, 2006.


Adam, T. 'Indirect effects of the blue streak cleaner wrasse (Labroides dimidiatus) on coral reefs.' Oral Presentation. EEMB Annual Graduate Student Symposium, University of California, Santa Barbara, CA, January 2006.


Bergsma, G. 'Symbionts Reduce Coral Susceptibility to Predation.' Oral Presentation. EEMB Annual Graduate Student Symposium, UCSB, January 2006.


Edmunds, P.J. ‘Monitoring coral communities in Moorea: one step on the road to understanding why the reefs are changing.’ Poster Presentation. LTER All Scientists Meeting, Estes Park, Colorado, September, 2006.


Hench, J.L. 'Circulation and transport in tropical lagoons: physics meets biology in paradise.' Invited Seminar, Inter-University Institute of Marine Sciences, Eilat, Israel, May 2006.

Hench, J.L. 'Physical oceanography of Moorea.' Invited Seminar. UCLA Marine Biology Quarter, Moorea, April 2006.


Lenihan, H. 'Predator-prey interactions in coral reefs: effects of hydrodynamics.' Department Seminar. Stanford University, April, 2006.


Price, N. ‘Do coralline algae influence coral recruitment?’ Oral Presentation. EEMB Annual Graduate Student Symposium, University of California, Santa Barbara, January 2006.


Schmitt, R.J. 'Coral reef research programs at UC Santa Barbara: linkage to sensor networks.' CREON and GLEON Workshop, Townsville, Australia, March 2006.


2005

Bergsma, G. 'Symbionts reduce coral susceptibility to predation.' Oral Presentation. Moorea Coral Reef LTER All Scientists Meeting, Santa Barbara, CA, November, 2005.
Brooks, A. 'Reef associated fishes, results of MCR LTER Year 1 monitoring efforts.' Oral Presentation. Moorea Coral Reef LTER All Scientists Meeting, Santa Barbara, CA, November, 2005.


Carpenter, R. 'Effects of productivity potential, hydrodynamic stress, and herbivory on resource allocation by subtidal macroalgae.' Benthic Ecology Annual Meeting, Williamsburg, VA, April, 2005.

Carpenter, R. 'Scale-dependent effects of flow on coral reef primary production.' EEMB Departmental Seminar, UC Santa Barbara, April, 2005.

Edmunds, P. 'Coral reef monitoring within the MCR LTER project.' Oral Presentation. Moorea Coral Reef LTER All Scientists Meeting, Santa Barbara, CA, November, 2005.


Holbrook, S.J., A. Brooks, R.J. Schmitt. 'Diversity responses to change in habitat-forming species on temperate and tropical reefs.' Scientific Roundtable, CRIOBE (Centre de Recherches Insulaires et Observatoire de l'Environnement), Moorea, French Polynesia, May, 2005.


Holbrook, S.J., D. Reed, R.J. Schmitt and A. Brooks. 'Diversity responses to change in habitat-forming species on temperate and tropical reefs.' LTER Annual Symposium, NSF, March, 2005.


Stewart, H. 'Biological response of kelp to changes in physical factors in and around a kelp bed.' Oral Presentation. ASLO DIALOG Symposium, Dauphin Island Sea Lab, Alabama, December, 2005.


Talmage, S. 'Patterns of abundance of Sargassum mangarevense across hydrodynamic and herbivory gradients in Moorea, French Polynesia.' Oral Presentation. Moorea Coral Reef LTER All Scientists Meeting, Santa Barbara, CA, November, 2005.


Washburn, L. 'Results of Year 1 MCR LTER Physical Oceanographic Monitoring Program.' Oral Presentation. Moorea Coral Reef LTER All Scientists Meeting, Santa Barbara, CA, November, 2005.

Whitmer, A. 'Education activities in marine LTER sites.' LTER Annual Symposium, NSF, March, 2005.

2004


Appendix III. Workshops Organized

2007

**Moorea Scientific Roundtable.** University of California, Santa Barbara, CA, March 3-4, 2007; meeting of CRIOBE and MCR LTER scientists to discuss common research objectives; S.J. Holbrook, R.J. Schmitt and A. Brooks members of organizing committee.


2006


**Recent Advances on Long-Term Ecological Research in Coral Reefs.** Joint MCR LTER and Kenting ILTER workshop held in Taichung, Taiwan, ROC, October 2, 2006. S.J. Holbrook and R.J. Schmitt members of organizing committee.

**Building Capacity and Linking Infrastructure in the Lake and Coral Reef Scientific Communities: Second CREON and GLEON Joint Workshop.** Workshop held in Townsville, Australia, March 28-31, 2006. S.J. Holbrook member of Organizing Committee (see [www.coralreefeon.org](http://www.coralreefeon.org) and [www.lakemetabolism.org](http://www.lakemetabolism.org)) where meeting agenda and report of Coral Reef Working Group (S.J. Holbrook and S. Kininmonth) are posted.

**Hydrodynamics of Flows on Coral Reefs and Rocky Shores II.** Special Session, Ocean Sciences Meeting (AGU/ASLO), Honolulu, HI, February 2006. Session co-chairs: PR: J H Fernando, Department of Mechanical and Aerospace Engineering, Arizona State University; J Leichter, Scripps Institution of Oceanography.

2005


**Moorea Scientific Roundtable.** CRIOBE (Centre de Recherches Insulaires et Observatoire de l'Environnement), Moorea, French Polynesia, May 5, 2005; meeting of CRIOBE and MCR LTER scientists and governmental agencies of French Polynesia to discuss common research objectives; S.J. Holbrook and R.J. Schmitt members of organizing committee.
Appendix IV. Biographical Sketches of MCR Investigators

Senior Investigators

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ALICE L. ALLDREDGE
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Education:
B.A. Biology, Carleton College, MI 1971
Ph.D. Ecology, University of California, Davis 1975

Academic Employment:
2004 - Present, Chair, Ecology, Evolution and Marine Biology, University of California, Santa Barbara
1986 - Present, Professor of Biology, University of California, Santa Barbara
1996 - 2004, Chair, Graduate Program in Marine Science, University of California, Santa Barbara
1982 - 1986, Associate Professor of Biology, University of California, Santa Barbara
1976 - 1982, Assistant Professor of Biology, University of California, Santa Barbara
1975 - 1976, NATO Postdoctoral Fellow, Australian Institute of Marine Science

MCR LTER Synergistic Activities:
Oversees and executes the water column chemistry, plankton and primary productivity time series data for MCR LTER. Since zooplankton are central in the reef food web and consumed by major reef inhabitants such as corals and fishes, Alldredge collaborates extensively with those investigating food web interactions on the reef and with those studying physical processes that provide the mechanism for delivery of detritus and zooplankton to various areas of the reef system. She also collects time series data on bacteria and interacts with those studying microbial processes and diversity. She is a member of the MCR LTER Executive Board, and co-leader of the Food Web Working Group within the MCR LTER.

Five publications most closely related to project:
Area of Expertise: Ichthyology, Population Genetics, Phylogeography of Marine Organisms

Education:
B.S.  Biochemistry, University of Paris 1983
M.S.  Molecular Biology, University of Paris 1985
Ph.D. Molecular Biology, University of Paris 1989

Academic Employment:
2005 - Present, Professor, University of California, Santa Cruz
2001 - 2005, Associate Professor of Biology, University of California, Santa Cruz
1994 - 2001, Assistant Professor of Biology, University of California, Santa Cruz
1991 - 1994, Postdoctoral Fellow, Hopkins Marine Station, Stanford University

MCR LTER Synergistic Activities:
A focus of my research is to develop a comprehensive understanding of the recruitment dynamics of the reef fish. In collaboration with scientists from CRIOBE, we will closely monitor recruitment levels of several species of damselfish and determine where the fish larvae are generated. This is particularly important when one considers that understanding the origin of larvae and the connectivity of various areas around the island are essential to assessing the effectiveness of the newly-formed marine protected areas on Moorea.

Five publications most closely related to project:


ANDREW J. BROOKS
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Education:
B.A. Biology, Marine Emphasis, Occidental College 1984
Certificate Aquatic Biology and Fisheries Management, University College North Wales 1987
M.A. Biological Sciences, University of California, Santa Barbara 1993
Ph.D. Ecology, Evolution, and Marine Biology, UC Santa Barbara 1999

Academic Employment:
2007 - Present, Associate Project Scientist, University of California, Santa Barbara
2004 - Present, Deputy Director, Moorea Coral Reef Long-term Ecological Research Site
2001 - Present, Director, Carpinteria Salt Marsh Reserve, University of California, Santa Barbara
1999 - 2006, Assistant Research Biologist, University of California, Santa Barbara
1998 - 2006, Lecturer, University of California, Santa Barbara

MCR LTER Synergistic Activities:
Serves as the Deputy Program Director of the MCR LTER; ad hoc member of the MCR LTER Executive Committee; responsible for the execution of and participates in the long-term, time series surveys of fishes for the MCR LTER; co-chair of MCR LTER working group on community and population dynamics, species interactions and nutrient cycling; participates in MCR LTER working groups on bio-physical coupling, and modeling of coral performance; MCR LTER representative to the Moorea Marine Consortium and Moorea Biocode Program; one of MCR LTER representatives to the Coral Reef Environmental Observatory Network (CREON); represents MCR LTER on UCSB Diving Safety and Boating Safety Committees; coordinates efforts of IT/IM personnel with other MCR LTER investigators; oversees all activities associated with day to day field operations in Moorea.

Five publications most closely related to project:


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Area of Expertise: Microbial Oceanography

Education:
B.A. Biology, Colby College, ME 1986
Ph.D. Microbial Ecology, University of Maryland 1994
Post-doc Marine Biogeochemistry, Bermuda Biological Station for Research 1994

Academic Employment:
2003 - Present, Associate Professor, University of California, Santa Barbara
2001 - 2003, Assistant Professor, University of California, Santa Barbara
1999 - 2000, Associate Scientist, BBSR
1997 - 1999, Assistant Scientist, BBSR

MCR LTER Synergistic Activities:
My group is involved with assessing the temporal and spatial variability of dissolved organic nutrients as well as microbial biomass for the water column time-series component of the MCR LTER program. We have also initiated a preliminary assessment of microbial diversity from the offshore environment to the reef environment. We combine traditional oceanographic measurements with molecular approaches to assess potential linkages between microbial community structure and water column biogeochemistry.

Five publications most closely related to project:


ROBERT C. CARPENTER  
Department of Biology  
California State University, Northridge  
Northridge, CA 91330  
Telephone: 818-677-3256  
Fax: 818-677-2039  
Email: robert.carpenter@csun.edu

Area of Expertise: Coral Reef Ecology, Hydrodynamic Forcing of Organismal and Community Metabolism

Education:
B.S.  Zoology, University of Michigan  1975
M.S.  Marine Science, University of the Pacific  1979
Ph.D.  Ecology, University of Georgia  1984

Academic Employment:
1994 - Present, Professor, California State University, Northridge, California
1991 -1994, Associate Professor, California State University, Northridge, California
1988 -1991, Assistant Professor, California State University, Northridge, California

MCR LTER Synergistic Activities:
I am a Co-PI of MCR LTER, a member of the MCR Executive Committee, and the MCR LTER representative to the LTER Planning Grant group. I am principally involved in data collection for time series studies on benthic component cover (primarily algae), invertebrate herbivore abundances, and measurements of rates of primary production at both the community (reef zone) and organism scales. Process-oriented research projects include: the role of hydrodynamics in modulating reef metabolism and how this cascades to higher trophic levels; and the use of remote sensing methods to estimate rates of reef primary production at reef-wide scales.

Five publications most closely related to project:


JOSEPH H. CONNELL
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Education:
B.S. Meteorology, University of Chicago, Chicago, Illinois 1946
M.A. Zoology, University of California, Berkeley 1953
Ph.D. Zoology, University of Glasgow, Scotland 1956

Academic Employment:
1996 - Present, Research Professor, University of California, Santa Barbara
1991 - Present, Professor Emeritus, University of California, Santa Barbara
1974 - 1980, Chairman, Marine Review Committee of the California State Coastal Commission
1966 - 1991, Professor, University of California, Santa Barbara
1961 - 1966, Associate Professor, University of California, Santa Barbara
1958 - 1961, Assistant Professor, University of California, Santa Barbara
1956 - 1958, Instructor, University of California, Santa Barbara

MCR LTER Synergistic Activities:
Regular consultations and scientific interactions with graduate and postdoctoral students as well as university faculty and researchers from the University of California, Santa Barbara as well as a variety of Australian universities. Reviewer of numerous grant proposals and journal manuscripts.

Five publications most closely related to project:
Area of Expertise: Ecophysiology of Tropical Reef Corals, Time Series Analyses of Coral Communities, Population Models for Tropical Reef Corals

Education:
B.S. Marine Biology, University of Newcastle 1983
Ph.D. Invertebrate Physiology, Glasgow University 1986

Academic Employment:
2001 - Present, Professor, California State University, Northridge
1997 - 2001, Associate Professor, California State University, Northridge
1992 - 1997, Assistant Professor, California State University, Northridge
1991 - 1992, Postdoctoral Researcher, University of Southern California
1989 - 1990, Postdoctoral Research Associate, Northeastern University
1989 - 1990, Adjunct Research Associate at the Marine Science Center, Nahant
1987 -1989, Senior Faculty Member, School for Field Studies, St. John, United States Virgin Islands

MCR LTER Synergistic Activities:
My primary responsibilities within the MCR LTER are (1) time series analysis of coral communities, and (2) process-oriented studies to test potential mechanisms that mediate changes in community structure. I am a Co-PI on the grant, a member of the MCR Executive Committee as well as each of three working groups addressing thematic approaches within the project. I have been actively engaged in international collaborations with the ILTER project in Taiwan (2 trips) and am working towards developing this collaboration to facilitate academic exchanges and ecosystem contrast between Taiwan and Moorea. My position at CSUN allows me to spread my LTER experience through classes taught on my home campus (Invertebrate Zoology, Physiological Ecology) and through a class in tropical coral biology taught in Moorea by the Three Seas Marine Biology Program (Northeastern University).

Five publications most closely related to project:


RUTH D. GATES  
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University of Hawaii  
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Area of Expertise: Molecular and Functional Biology of Corals

Education:
B.S. Marine Biology, University of Newcastle upon Tyne, UK 1984  
Ph.D. Zoology, University of Newcastle upon Tyne, UK 1990

Academic Employment:
2003 - Present, Assistant Researcher, University of Hawaii  
2002 - 2003, Assistant Researcher, University of California, Los Angeles

MCR LTER Synergistic Activities:
Ongoing participation in the coral time series studies through an active collaboration with Peter Edmunds; establishment of comparative sampling sites in Hawaii with the goal of providing a Pacific comparison for MCR; development of research proposals leveraging MCR funding; participation in a diversity of outreach and education activities, collaboration with state and federal partners.

Five publications most closely related to project:


GRETCHEL E. HOFMANN  
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Santa Barbara, California 93106-9610  
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Area of Expertise: Ecological Physiology of Marine Animals  

Education:
B.S. Zoology and Physiology, University of Wyoming, Laramie 1985  
M.S. Biology, University of Colorado, Boulder 1988  
Ph.D. Biology, University of Colorado, Boulder 1992  
Post-doc Zoology, Oregon State University, Corvallis 1993  
Post-doc NSF Marine Biotechnology and Ocean Sciences, Stanford University 1996  

Academic Employment:
2004 - Present, Associate Professor, University of California, Santa Barbara  
2002 - 2004, Assistant Professor, University of California, Santa Barbara  
1999 - 2002, Assistant Professor, Arizona State University  
1997 - 1999, Assistant Professor, University of New Mexico  
1995 - 1996, Postdoctoral Research Fellow, Hopkins Marine Station, Stanford University  
1992 - 1995, NSF Postdoctoral Research Fellow, Oregon State University  

MCR LTER Synergistic Activities:
Co-Instructor for the NSF Antarctic Biology Course, 1999-2001 (PI: Dr. D. Manahan, University of Southern California); instructor in a marine biology field course for the Minority Access to Research Careers (MARC) program at Arizona State University; PI on an NSF ADVANCE Leadership Award to increase the recruitment and retention of women in science; mentor for Howard Hughes Medical Institute Undergraduate Fellows, University of New Mexico and Arizona State University, providing and supervising 8 undergraduate students in research projects during summer and semester rotations from 1997 to 2002; sponsored 3 NSF REU students in association with an NSF grant from Ecological and Evolutionary Physiology (ISBN 9723063/ISBN 0096100).  

Five publications most closely related to project:  
SALLY J. HOLBROOK
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Area of Expertise: Community Ecology, Maintenance of Biodiversity, Biotic Interactions

Education:
B.A. Biology, Smith College, MA 1970
Ph.D. Zoology, Univ. California Berkeley 1975

Academic Employment:
1987 - Present, Professor, University of California, Santa Barbara
1981 - 1987, Associate Professor, University of California, Santa Barbara
1975 - 1981, Assistant Professor, University of California, Santa Barbara

MCR LTER Synergistic Activities:
Co-PI and Member of Moorea Coral Reef LTER project; member of MCR Executive Committee, and participant in MCR LTER investigations of ecological structure and function of coral reef communities; Co-PI and Member of Santa Barbara Coastal LTER project, member of SBC Executive Committee, and participant in SB LTER investigations of trophic structure and interactions on California rocky reefs; Chair, UCOP Select Committee of Decommissioning of Offshore Oil and Gas Production Facilities (report url: http://www.ucop.edu/research/ucmc_decommissioning/index.html); Member, LTER Executive Board; Chair, co-chair and member of graduate student dissertation committees; Faculty Advisor, Santa Cruz Island Reserve, UC Natural Reserve System, 1981-present; Member, UCSB Chancellor’s Outreach Advisory Board and Chair, Faculty K-12 Outreach Grants Committee; Co-organizer, Coral Reef Environmental Observatory Network (CREON; www.coralreefeon.org).

Five publications most closely related to project:
DAVID W. LEA  
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University of California  
Santa Barbara, CA 93106-9630  
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Area of Expertise: Paleoclimate, Paleoceanography and Geochemistry

Education:
B.S.  Geology, Haverford College, Pennsylvania  1984
Ph.D.  Oceanography, Massachusetts Institute of Technology  1990

Academic Employment:
1999 - Present, Professor, University of California, Santa Barbara
2002 - 2003, Leverhulme Visiting Professor, University of Cambridge, UK
1995 - 1999, Associate Professor, University of California, Santa Barbara
1995 – 1996, Visiting Associate Professor, University of Chicago, Illinois
1989 - 1995, Assistant Professor, University of California, Santa Barbara

MCR LTER Synergistic Activities:
I have played an active role in the academic community by convening and chairing eight theme sessions at national and international meetings since 1995. These sessions play a significant role in allowing scholars to exchange ideas and data on the topics of climate proxies and geochemical tracers. I view education as a major part of my job, and I teach classes that range from first-year level oceanography to graduate seminars. My research activities directly influence my teaching at all levels because I incorporate the latest findings into my teaching. I also try to involve undergraduates in my research program wherever possible. Finally, I give talks to general audiences about global climate change. With my wife, a high school teacher, I took 17 high school students to the Galapagos Islands in spring 2001 for an educational trip covering the natural history of this region.

Publications:
JAMES J. LEICHTER
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, CA 92093-0227
Telephone: 858-822-5330
Fax: 858-534-6500
Email: jleichter@ucsd.edu

Area of Expertise: Physical-biological Coupling

Education:
B.A. English, Stanford University, CA 1988
M.S. Biology, Northeastern University, MA 1992
Ph.D. Biology, Stanford University, CA 1997
Post-doc Biology, Woods Hole Oceanographic Institution, MA 2001

Academic Employment:
2007 – Present, Associate Professor, University of California, San Diego
2001 - 2007, Assistant Professor, University of California, San Diego
1997 - 2001, Postdoctoral Fellow, Woods Hole Oceanographic Institution, MA
1990 -1992, N.S.F. Research Assistant, Northeastern University, MA
1988 - 1989, Research Technician, Stanford University, CA
1988 - 1989, Research Intern, Monterey Bay Aquarium, CA

MCR LTER Synergistic Activities:
Generated physical oceanographic database from Florida Keys research for science-based high school
lesson plans developed through the National Undersea Research Center, 2001-2002.

Five publications most closely related to project:
to Conch Reef (Florida Keys) by internal tidal bores. Limnology and Oceanography 41:1490-1501.


Leichter, J.J. and S. J. Genovese. 2006. Intermittent upwelling and subsidized growth of the
scleractinian coral Madracis mirabilis on the deep fore reef slope of Discovery Bay, Jamaica.
Marine Ecology Progress Series 316:95-103.
HUNTER S. LENIHAN  
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University of California, Santa Barbara  
Santa Barbara, CA 93106-5131  
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Area of Expertise: Marine Community Ecology, Human-resource Interactions, Fishery Management

Education:
B.S. Conservation of Natural Resources, University of California, Berkeley 1986  
M.S. Marine Science, Moss Landing Marine Laboratories 1992  
Ph.D. Marine Science, University of North Carolina, Chapel Hill 1998

Academic Employment:
2006 - Present, Associate Professor, University of California, Santa Barbara  
2002 - 2006, Assistant Professor, University of California, Santa Barbara  

MCR LTER Synergistic Activities:
Coral population dynamics; Modeling circulation patterns in lagoon systems; Fisheries management of giant clam in Moorea; Participation in Natural-Social Science research planning effort for MCR LTER; Collaboration with SBC LTER for joint Natural-Social Science research planning effort; Advising UG students involved in ESA SEEDS program; Participating in MCR LTER physical-biological coupling research group.

Five publications most closely related to project:


SALLY MACINTYRE  
Ecology, Evolution and Marine Biology  
University of California, Santa Barbara  
Santa Barbara, CA 93106-9610  
Telephone: 805-893-3951  
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Area of Expertise: Physical-coupling, Biological-coupling, Chemical-coupling  

Education:  
B.A. Zoology, Duke University   1972  
Ph.D. Zoology, Duke University   1981  
Post-doc University of California, Santa Barbara   1982  

Academic Employment:  
2004 - Present, Professor, University of California, Santa Barbara  
1985 - Present, Associate Research Limnologist/Oceanographer, University of California, Santa Barbara  
1996 - Present, Lecturer, University of California, Santa Barbara  
1987 -1989, Lecturer, University of California, Santa Barbara  
1982 -1985, Assistant Research Engineer, University of California, Santa Barbara  

MCR LTER Synergistic Activities:  
MCR LTER Executive Committee; member, MCR LTER Physical Oceanography Group; member MCR LTER Water Column Processes Group; member MCR LTER benthic metabolism group; Associate Scientist with SBC and ARC LTERs; Member, Expert Committee to the World Bank advising on the Stability of Lake Kivu, 2006 to present; U.S. National Representative for the Int. Society of Limnology and Head of the Physical Limnology Section of SIL, 2004-2007; ASLO Steering Committee charged by NSF to develop research initiatives for inland waters for the next decade, 2002-2004; Associate Editor: Limnology and Oceanography: Methods, 2002-2007; Associate Editor: Biogeosciences, 2004-2006; Education and Human Resources Committee for ASLO, 2002-2004. Development of software for analysis of time series physical data used by SBC, ARC, and MCR LTER sites.  

Five publications most closely related to project:  
STEPPHANE MARITORENA
Institute for Computational Earth System Science
University of California, Santa Barbara
Santa Barbara, CA, 93106-3060
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Fax: 805-893 2578
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**Area of Expertise:** Marine Optics, Bio-optical Modeling, Remote Sensing

**Education:**
- B.S. Biology, University P. et M. Curie, Paris, France 1986
- M.S. Biological Oceanography, University P. et M. Curie, Paris, France 1987
- Ph.D. Oceanography, Université Française du Pacifique, Tahiti, French Polynesia 1993

**Academic Employment:**
- 2002 - Present, Associate Researcher, University of California, Santa Barbara
- 1999 - 2002, Assistant Researcher, University of California, Santa Barbara
- 1993 - 1995, Postdoctoral Research Scientist and Teaching Assistant, Université Française du Pacifique

**MCR LTER Synergistic Activities:**
Development of the ocean color (chlorophyll, $a_{cdu}(443)$, $b_{pp}(443)$, $Kd(490)$), PAR and SST satellite time-series. General and thematic mapping of the reef from high resolution satellite imagery.

**Five publications most closely related to project:**
Area of Expertise: Theoretical Ecology

Education:
B.S. Physics and Theoretical Physics, University of St. Andrews 1968
Ph.D. Theoretical Physics, University of St. Andrews 1971
Post-doc University of Sussex, England 1972

Academic Employment:
1991- Present, Professor, University of California, Santa Barbara
2001- 2004, Chair, University of California, Santa Barbara
1989 - 2001, Professor, University of Strathclyde, Scotland
1985 - 1989, Visiting Research Biologist, University of California, Santa Barbara
1985 - 1986, Personal Professor in Applied Physics, University of Strathclyde, Scotland
1983 - 1985, Reader in Applied Physics, University of Strathclyde, Scotland
1977 - 1979, Senior Lecturer, University of the South Pacific, Suva, Fiji
1972 - 1977, Lecturer in Applied Physics, University of Strathclyde, Scotland

MCR LTER Synergistic Activities:
Ecological theory and modeling relating to many MCR investigations. Primary interest is in applications of dynamic energy budget theory to coral growth, reproduction and interactions. Other interests include development of theory appropriate for modeling population dynamics on heterogeneous landscapes. Supervision of graduate students working on MCR projects.

Five publications most closely related to project:


Area of Expertise: Population Dynamics, Community Dynamics

Education:
B.A. Environmental Biology, University of Colorado, Boulder, CO 1970
M.S. Marine Science, University of the Pacific, CA 1975
Ph.D. Biology, University of California, Los Angeles 1979
Post-doc University of California, Santa Barbara 1981

Academic Employment:
1994 - Present, Professor, University of California, Santa Barbara
1993 - 1994, Associate Professor, University of California, Santa Barbara
1992 - 1993, Research Biologist, University of California, Santa Barbara
1987 - 1992, Associate Research Biologist, University of California, Santa Barbara
1981 - 1987, Assistant Research Biologist, University of California, Santa Barbara

MCR LTER Synergistic Activities:
Program Director, Coastal Toxicology Training Program, UC Toxic Substances Research & Teaching Program, a UC-wide graduate training program; Lead PI of the Moorea Coral Reef LTER, member of Executive Committee, and participant in MCR LTER investigations of ecological structure and function of coral reef communities; Associate Investigator of Santa Barbara Coastal LTER, and participant in SBC LTER investigations of trophic structure and interactions on California rocky reefs; Member, LTER Network Science Council; Director, Coastal Research Center of Marine Science Institute, facilitating interdisciplinary research and research training activities in coastal marine environments; Chair, UCOP Scientific Advisory Committee for the California Sea Grant Program; Scientific Advisory Panel to the California Coastal Commission for the San Onofre Nuclear Generating Station mitigation program.

Five publications most closely related to project:
Area of Expertise: Coastal Physical Oceanography, Mesoscale Processes

Education:
B.S. Mechanical Engineering, University of Arizona 1974
M.S. Engineering Science, University of California at San Diego 1978
Ph.D. Engineering Science, University of California at San Diego 1982

Academic Employment:
1998 – Present, Professor, University of California, Santa Barbara
1993 - 1998, Associate Professor, University of California, Santa Barbara
1991 - 1993, Assistant Professor, University of California, Santa Barbara
1985 - 1990, Research Assistant Professor, University of Southern California, Los Angeles
1982 - 1985, Postgraduate Research Oceanographer, Scripps Institution of Oceanography, La Jolla, CA
1977 - 1982, Research Assistant and Teaching Assistant, University of California, San Diego
1975 - 1977, Aeroballistics Engineer, General Dynamics, Convair Division, San Diego, CA

MCR LTER Synergistic Activities:
My MCR LTER research explores how oceanographic processes, such as ocean currents and waves, affect reef communities. These processes vary over a range of time scales and I am working with MCR LTER colleagues to obtain long, high resolution time series to quantify these processes. Synthetic activities include linking oceanographic processes with changing coral reef communities. I collaborate extensively with colleagues in ecology, geology, and geo-chemistry. Graduate and undergraduate students participate in field work, data analysis and synthesis, and I use results from my MCR LTER research in my teaching. I serve on the Network Information System Advisory Committee (NISAC).

Five publications most closely related to project:
ALLISON C. WHITMER
Department of Biology and Marine Science Institute
University of California, Santa Barbara
Santa Barbara, CA 93106
Telephone: 805-893-6174
Fax: 805-893-4724
Email: whitmer@lifesci.ucsb.edu

Area of Expertise: Science Education

Education:
B.S. Environmental Biology, California State University, Northridge 1990
M.S. Biology, California State University, Northridge 1993
Ph.D. Botany, University of Washington, Seattle 2002

Academic Employment:
2002 - Present, Director of Education and Research Scientist, University of California, Santa Barbara
1999 - 2003, Undergraduate Programs Manager, Arizona State University
2001 -2003, Instructor, Shoals Marine Lab
1999 - 2001, Research Associate, University of New Mexico, Albuquerque
1990 - 1998, Teaching Assistant, University of Washington and CSU, Northridge

MCR LTER Synergistic Activities:
Advisory Committee Member, Center for Equity in Mathematics and Science Education, University of California, Santa Barbara; PI on Arizona Board of Regents Learner-Centered Education Grant, Enhancing Learning in First-Year Biology Courses Through the Use of Classroom Technologies; Led the development of a program-wide assessment protocol for NSF-funded UMEB programs, Standardized Assessment and Evaluation of NSF-Undergraduate Mentoring in Environmental Biology (UMEB) Programs (Supplement to ASU’s UMEB grant); Co-PI on NSF Grant: ADVANCE: Supporting Women in Science (SWIS), which focuses on recruitment and retention of women in science; Review Panel Member, Course, Curriculum and Laboratory Improvement (CCLI) program (DUE), National Science Foundation.

Five publications most closely related to project:
SUSAN L. WILLIAMS
Bodega Marine Laboratory and Evolution and Ecology
University of California, Davis
Bodega Bay, CA 94923-0247
Telephone: 707-875-2211
Fax: 707-875-2009
Email: slwilliams@ucdavis.edu

Area of Expertise: Marine Ecology

Education:
B.S. Biology, University of Michigan 1972
M.S. Biological Oceanography, University of Alaska 1977
Ph.D. Botany and Marine Biology, University of Maryland 1981

Academic Employment:
2000 - Present, Director, Bodega Marine Laboratory;
2000 - Present, Professor, University of California, Davis
1995 - 2001, Professor, San Diego State University
1993 - 2000, Director, San Diego State University
1990 - 1995, Associate Professor, San Diego State University
1990 - 1997, Adjunct Assistant Professor, University of Washington
1986 - 1990, Research Assistant Professor, University of Washington
1984 - 1986, Science Director, NOAA National Undersea Research Program, St. Croix, USVI
1984 - 1990, Adjunct Assistant Professor, University, St. Croix, USVI
1982 - 1984, Assistant Research Professor, State University of New York, Stony Brook

MCR LTER Synergistic Activities:
Participation in time series nitrogen fixation studies; participation on MCR LTER Executive Committee;
participation in IOOS and NEON planning; participation in National Association of Marine Laboratories.

Five publications most closely related to project:
topography on flow speed profiles in a coral fore reef environment. Limnology and
Oceanography 38:687-694.

Marine Biology 130:223-231.

Williams, S.L. and R.C. Carpenter. 1998. Effects of unidirectional and oscillatory water flow on
nitrogen fixation (acetylene reduction) in coral reef algal turfs, Kaneohe Bay, Hawaii. Journal of

disturbances to Hawaiian algal turf communities. Journal of Experimental Marine Biology and
Ecology 248:1-34.

Appendix V. Biographical Sketches of MCR Postdoctoral Investigators

Postdoctoral Investigators

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Michael Stat.................................................................47
Hannah Stewart.............................................................48
Ricardo Beldade
Ecology and Evolutionary Biology
University of California
Santa Cruz, CA, 95060
Telephone: 831-459-1282
Email: ricardobeldade@yahoo.com

**Area of Expertise:** Marine Ecology; Population Dynamics, Population Genetics

**LTER Research Area:** Population Dynamics

**Education:**
- B.S.  Marine Biology, Sciences Faculty at Lisbon University 1998
- Ph.D.  Marine Ecology, Sciences Faculty at Algarve University 2006

**Academic Employment:**
- 2007 - Present, Post-doctoral research fellow, University of California, Santa Cruz
- 2001 - 2003, Technician
- 1999 - 2001, Technician

**MCR LTER Participation:**
Between March and May 2006, I worked on recruitment dynamics of *Dascyllus trimaculatus* at Giacomo Bernardi’s laboratory (UCSC). We looked for differences between the recruits sampled from a channel and crest row of anemones planted in Moorea. The presence of a particular mutation (OC3) in the mitochondrial DNA was assessed through RFLPs and later confirmed by sequencing the individuals bearing that mutation. Besides the differences in the number of individuals carrying the OC3 mutation between the channel and crest rows, the results suggest some degree of self-recruitment, which justifies a follow up on this project to assess self-recruitment levels. In February and March 2007 I worked on parentage of the orange-fin anemonefish, *Amphiprion chrysopterus*, at Serge Plane’s laboratory (Universite de Perpignan). We tested approximately 60 microsatellites, designed for other *Amphiprion* species. The PCR amplification conditions to use the 20 microsatellites that worked were optimized. PCR amplifications were multiplexed for 5 of these loci. After this, the DNA of 151 samples collected at Moorea in 2006 was extracted and amplifications for all of the microsatellites were done. The PCR products were sequenced and the individuals scored for 18 microsatellites (2 out of the twenty selected initially did not work for all of the samples). My participation in the MCR LTER has given me the opportunity to use several molecular markers, including mitochondrial DNA and microsatellites in addressing parentage assessment, population genetics and connectivity. These studies will enable me to pursue my interests which span ecology, conservation, and management. In fact, I believe that dispersion and connectivity between fish populations have and will prove to be one of the main tools for management and conservation of marine biodiversity.

**Publications most closely related to MCR LTER:**

JONATHAN P. FRAM
Marine Science Institute
University of California
Santa Barbara, CA, 93106
Telephone: 805-893-7804
Email: jfram@msi.ucsb.edu

Area of Expertise: Environmental Fluid Mechanics

LTER Research Area: Primary Productivity, Physical-biological Coupling

Education:
B.A. Physics, Pomona College 1995
M.A. Civil and Environmental Engineering, University of California, Berkeley 2001
Ph.D. Civil and Environmental Engineering, University of California, Berkeley 2005

Academic Employment:
2007 - Present, Associate Specialist I, University of California, Santa Barbara
2006 - 2007, Assistant Specialist III, University of California, Santa Barbara

MCR LTER Participation:
I was responsible for field work in support of the Spatial – Temporal Variability of Turbulence within Coral Reefs mini-grant in May/June 2006 and March 2007. Work has included measurements of benthic primary productivity, assessment of gas transfer coefficients for improved accuracy in benthic metabolism measurements, turbulence in coral reefs, residence time of solutes and particles in coral heads, and vertical mixing in the water column across the back reef. I also worked with Sally MacIntyre in Cook’s Bay to quantify exchange processes and plume dynamics. In addition, I contributed to the design and implementation of Jenny Romanowich’s Undergraduate Honor’s Thesis.

Publications most closely related to MCR LTER:
JAMES L. HENCH
Environmental Fluid Mechanics Laboratory
Stanford University
Stanford, CA 94305-4020
Telephone: 650-725-5948
Email: jhench@stanford.edu

Area of Expertise: Shallow Water Physical Oceanography, Physical-biological Interactions

LTER Research Area: Physical-biological Coupling, Physical and Ecological Modeling

Education:
B.S. Civil Engineering, North Carolina State University 1991
M.S. Civil Engineering, Stanford University 1992
Ph.D. Physical Oceanography, University of North Carolina at Chapel Hill 2002

Academic Employment:
2006 – Present, Research Associate, Stanford University
2004 - 2006, Postdoctoral Research Fellow, Stanford University
2003 - 2004, Postdoctoral Research Fellow, University of North Carolina at Chapel Hill
1995 - 2002, Researcher/ Teaching Assistant, University of North Carolina at Chapel Hill
1994 - 1995, Teaching Assistant, University of Washington
1993 - 1994, Research Technician, University of North Carolina at Chapel Hill
1991 - 1992, Research Assistant, Stanford University

MCR LTER Participation:
I am conducting physical oceanographic studies of circulation and exchange over coral reefs, lagoons, and reef passes. These physical processes are central to the physical-biological coupling theme of the MCR LTER. My work has quantified the role of tides versus wave driven forcing, the rate and amount of flushing in the backreef lagoons, the role of stratification on lagoon-ocean exchange, wave-turbulence separation, and dynamical balances of wave-driven flow. I am collaborating with several other MCR LTER participants on coral growth and predation, and larval transport. The MCR LTER has been of tremendous help in logistical support (e.g., lab space, field instrumentation, SCUBA equipment, shop tools, boats, and technicians), and mini-grant support for travel and supplies. My connection to the MCR LTER was also extremely helpful in successfully obtaining a new NSF grant (OCE-0622967) for more detailed physical oceanographic studies in Moorea. Finally, the intellectual exchange with the wide range of other MCR LTER investigators has been invaluable for my professional development.

Publications most closely related to MCR LTER:


Area of Expertise: Marine Microbial Ecology

LTER Research Area: Population Dynamics, Food Web and Nutrient Dynamics, Physical-biological Coupling

Education:
B.A. Biology and Russian, George Mason University 1995
Ph. D Microbiology, Oregon State University 2004

Academic Employment:
2006 - Present, Postdoctoral Researcher, University of California, Santa Barbara
2004 - 2006, Postdoctoral Research Fellow, Cornell University

MCR LTER Participation:
In March 2007, we completed the first microbial community structure survey. Initial results indicate that there are unique microbial communities associated with different portions of the reef ecosystem. Correlations with DOM and nutrients are also evident and current efforts to identify specific lineage contributions to community variability are underway. Total cell counts for Bacteria, the SAR11 clade, and the unicellular cyanobacteria Synechococcus have been completed and a clone library is being constructed to identify unique microbial signatures associated with reef communities. These data provide valuable information about microbial community structure that can be used to support future studies addressing more specific questions related to reef ecology and health.

Publications most closely related to MCR LTER:
Morris, R.M., K. Longnecker and S.J. Giovannoni. 2006. Pirellula and OM43 are among the dominant lineages identified in an Oregon coast diatom bloom. Environmental Microbiology 8:1361-1370.
Area of Expertise: Molecular Diversity, Phylogeography

LTER Research Area: Population Dynamics

Education:
B.S. University of Sydney 2000
Ph.D. University of Sydney 2006

Academic Employment:
2005 - Present, Assistant Researcher, University of Hawaii
2000 - 2005, Research Assistant, University of Hawaii

MCR LTER Participation:
My involvement in the MCR LTER project has allowed me to investigate the molecular diversity of coral endosymbionts from this region, which has not been previously performed. The project has funded the field expenses to sample the coral, including boating and diving and the use of the lab facilities at the Gump Station for sample processing. This experience has allowed me to interact with other scientists working on diverse projects funded by the MCR LTER project which target the same reef environment and has expanded my understanding of coral reef biology.

Publications most closely related to MCR LTER:
Area of Expertise: Marine Ecology, Physical-biological Interactions

LTR Research Area: Primary Productivity, Physical-biological Coupling

Education:
B. S. Biology, University of Saskatchewan 1995
M.S. Biology, California State University, Northridge 1999
Ph.D. Integrative Biology, University of California, Berkeley 2004

Academic Employment:
2007 - Present, Postdoctoral Fellow, University of Washington
2004 - 2006, Postdoctoral Research Associate, University of California, Santa Barbara

MCR LTER Participation:
From October 2004 to December 2006, I held a half-time postdoctoral appointment with the Moorea coral Reef LTER. Affiliation with the LTER provided me resources (personnel, equipment, funding) that I would never have had access to otherwise. Interaction with other non-LTER and LTER scientists, particularly Russ Schmitt and Sally Holbrook, provided me valuable mentorship through collaborations with these successful, established scientists. In addition, I also had the opportunity to collaborate with LTER graduate student Nichole Price and researcher Andrew Brooks that expanded the range of projects that I was exposed to. All-scientist meetings were also a valuable form of interaction with other scientists, and my research benefited from such interactions. As a member of the LTER I had access to the LTER lab space and equipment at the Gump Station in Moorea. These include boats, vehicles, computing facilities and support, cameras, analytical tools, housing, and logistic support from the LTER technicians and field assistants. In addition, I also benefited from support for attending meetings, including costs of printing posters, airfare, housing, per diem, and from the recognition of being associated with the LTER at meetings. For me this was an invaluable experience, and an unbelievable privilege to be included in this program. It was the best possible training that I could have hoped for at this point in my career. I anticipate that my connections with the LTER will continue throughout my career.

Publications most closely related to MCR LTER:


# Appendix VI. Profiles of MCR Graduate Students

**Graduate Students**

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<td>Gerick Bergsma</td>
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<td>Kate Buenau</td>
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<td>Kate Hanson</td>
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<td>Corinne Kane</td>
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<td>Jennifer Lape</td>
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<td>Mairead E. Maheigan</td>
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<td>Nancy Muehllehner</td>
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<td>Jacqueline L. Padilla-Gamiño</td>
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<td>Abigail Poray</td>
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<td>Nichole N. Price</td>
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<td>Hollie Putnam</td>
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<td>Melissa I. Spitler</td>
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<td>Stephanie Talmage</td>
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<tr>
<td>Annie Yau</td>
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</tr>
</tbody>
</table>
THOMAS ADAM  
Ecology, Evolution and Marine Biology  
University of California  
Santa Barbara, CA 93106  
Email: adam@lifesci.ucsb.edu

Status: Ph.D. student, 4th year  
Program: Ecology, Evolution, and Marine Biology  
Current Advisor: Russell Schmitt

Previous Education:  
B.S. Zoology, University of Florida 2002

Areas of Research: Population Dynamics, Disturbance Patterns, Community Ecology, Behavioral Ecology

Title of Graduate Research Project:  
ECOLOGICAL CONSEQUENCES OF A CLEANER-CLIENT MUTUALISM ON CORAL REEFS

Project Description:  
A common interaction on coral reefs involves cleaner fish that are visited by a wide variety of client fishes for the removal of ectoparasites, primarily gnathiid isopods. Cleaners are likely to have large indirect effects on reef residents by attracting and concentrating a diverse assemblage of client fishes to cleaner stations, and I am using field observations and experiments to quantify some of these indirect effects. For example, manipulative experiments indicate that cleaners attract coral predators and as a consequence have an indirect negative effect on corals near cleaning stations. In addition to quantifying indirect effects, I am developing a framework that considers the costs and benefits of the cleaning interaction for client fishes and uses data on the behavior of different client species to predict the extent to which cleaners should influence the distribution patterns of those particular clients. Finally, because cleaners influence the distribution patterns of many species of coral reef fishes, understanding the processes that control the distribution and dynamics of cleaners themselves is an important aspect of my research.

MCR LTER Participation:  
The MCR LTER has been instrumental in aiding my research by providing funding and access to facilities, and has contributed significantly to my professional development by fostering communication with other LTER researchers including professors, post-docs and graduate students. In addition, the MCR LTER has given me an opportunity to communicate my research with other LTER scientists and get valuable feedback that has greatly improved my research. In addition to providing funding for my housing costs and food while conducting research, the MCR LTER has provided equipment that has been instrumental for my research including lab space and general lab equipment (including balances and microscopes), as well as access to boats and SCUBA equipment essential for my research.

Conferences Attended:  
Southern California Animal Behavior Symposium, Santa Barbara, CA, 2007  
MCR LTER Annual Meeting, Santa Barbara, CA, 2006  
LTER All Scientists Meeting, Estes Park, CO, 2006  
Ecology, Evolution and Marine Biology Graduate Student Symposium, Santa Barbara, CA, 2006
Western Society of Naturalists Annual Meeting, Monterrey, CA, 2005
MCR LTER Annual Meeting, Santa Barbara, CA, 2005
Ecology, Evolution and Marine Biology Graduate Student Symposium, Santa Barbara, CA, 2005
Western Society of Naturalists Annual Meeting, Long Beach, CA, 2004

Presentations:
Invited talk, Do adult cleaners facilitate juvenile conspecifics at cleaner stations?  MCR LTER Annual Meeting, 2006
Poster presentation, Indirect effects of cleaner fish on a branching coral.  MCR LTER Annual Meeting, 2006
Poster presentation, Indirect effects of cleaner fish on a branching coral.  LTER All Scientists Meeting, 2006
Invited talk, Indirect effects of the cleaner wrasse, *Labroides dimidiatus*, on coral reefs.  MCR LTER Annual Meeting, 2005
GERICK BERGSMA  
Ecology, Evolution and Marine Biology  
University of California  
Santa Barbara, CA  93106  
Email: bergsma@lifesci.ucsb.edu

Status:  Ph.D. student, 4th year  
Program:  Ecology, Evolution and Marine Biology  
Current Advisor:  Sally Holbrook

Previous Education:  
B.S.  Zoology, University of Washington  2000

Areas of Research:  Ecosystem Ecology, Population Dynamics, Disturbance Patterns, Mutualisms, Indirect Interactions, Community Structuring, Physical-biological Coupling

Title of Graduate Research Project:  
ECOSYSTEM EFFECTS OF TUBE-DWELLING CORAL SYMBIONTS

Project Description:  
On tropical reefs, coral growth and morphology drive accretion, productivity and habitat structure, impacting local diversity and abundance of reef-associated species. Reef-building corals also form close associations with many organisms, potentially forming symbioses that alter coral structure and productivity. Symbiotic organisms that facilitate the addition of physical structure or increase live coral cover, therefore, could appreciably impact reef ecology. Tube-dwelling chaetopteridean polychaetes and gammaridean amphipods induce growth of finger-like projections on colonies of the dominant genera of reef-building corals in the northern lagoons of Moorea, French Polynesia. These associations are ubiquitous throughout the lagoons, indicating that the symbiont-induced growth forms add significant three-dimensional structure to the reef, potentially impacting both the ecology of the coral and of other organisms living in and feeding on the reef. The association of amphipods with Montipora is particularly prevalent, and is being used to document the effects of these symbioses on coral growth, reproduction and predation, as well as the emergent effects on fish and invertebrate diversity and abundance.

MCR LTER Participation:  
Since its inception, the MCR LTER has aided my research and graduate career by providing equipment, funding and access to other LTER researchers, and I am fortunate for the huge increase in academic resources the MCR LTER has made available to me. Equipment provided through LTER funding has been crucial in conducting my field and laboratory work. In the field, LTER boats and technicians were instrumental in the deployment and recovery of field outplants, and LTER laboratory space and equipment such as microscopes, cameras, and computer facilities were necessary for me to identify my study organisms. In the future, I am hoping to use LTER flumes and oceanographic equipment in the field, and also intend to use atmospheric and oceanographic data collected by the LTER in the analysis of my field data. Additionally, the LTER has provided invaluable opportunities for me to network and collaborate with professors and fellow graduate students from a number of universities. I have been able to broaden the scope of my research by interacting with taxonomists, physiologists and other specialists I’ve met both through the MCR LTER, as well as part of an ILTER exchange with the National Museum of Marine Biology and Aquarium in Taiwan (Kenting Coral Reef ILTER). The
LTER has also provided numerous opportunities for the dissemination of my research, most notably the MCR LTER Annual Meeting and the LTER All-Scientists Meeting.

**Conferences Attended:**
Ecology, Evolution and Marine Biology Graduate Student Symposium, Santa Barbara, CA, 2007
Western Society of Naturalists Annual Meeting, Seattle, WA, 2006
MCR LTER Annual Meeting, Santa Barbara, CA, 2006
Ecology, Evolution and Marine Biology Graduate Student Symposium, Santa Barbara, CA, 2006
Western Society of Naturalists Annual Meeting, Monterrey, CA, 2005
MCR LTER Annual Meeting, Santa Barbara, CA, 2005
Ecology, Evolution and Marine Biology Graduate Student Symposium, Santa Barbara, CA, 2005
Western Society of Naturalists Annual Meeting, Long Beach, CA, 2004

**Presentations:**
Invited talk, Comparison of tube-dwelling symbiotic amphipods of Moorea and Taiwan.  NMMA Coral Lab Meeting, 2007
Submitted talk, Mutualistic tube-dwelling amphipods protect coral from predators.  Western Society of Naturalists Annual Meeting, 2006
Invited talk, Mutualistic tube-dwelling amphipods enhance growth in corals.  MCR LTER Annual Meeting, 2006
Poster presentation, Coral mutualist induced morphological defense from echinoid predators.  LTER All Scientists Meeting, 2006
Submitted talk, Symbionts reduce coral susceptibility to predation.  University of California, Santa Barbara Ecology, Evolution and Marine Biology Graduate Student Symposium, 2006
Invited talk, Ecological significance of tube-dwelling amphipods.  MCR LTER Annual Meeting, 2005
KATE BUENAU
Ecology, Evolution, and Marine Biology
University of California
Santa Barbara, CA, 93106
Email: buenau@lifesci.ucsb.edu

Status: Ph.D. student, 4th year
Program: Ecology
Current Advisor: Roger Nisbet

Previous Education:
B.S. Biology, Arizona State University 2003

Areas of Research: Population Dynamics, Disturbance Patterns, Physical and Ecological Modeling

Title of Graduate Research Project:
POSITIVE INTERACTIONS AND SPACE COMPETITION: MODELING REEF DYNAMICS FROM A LANDSCAPE PERSPECTIVE

Project Description:
My project involves modeling interactions between benthic species competing for space on heterogeneous landscapes: particularly, the settlement and growth of coral as it interacts with crustose coralline algae. As high quality habitat for juvenile corals is distributed unevenly at multiple scales on a reef, spatial modeling is important for determining the effects of habitat selection and interactions with other benthic species. Crustose coralline algae are patchily distributed and interact with coral along a spectrum from facilitation to inhibition, depending on the species. These interactions may be critical for determining the population dynamics and distributions of coral following disturbance. I am developing spatially explicit models that incorporate heterogeneous habitat quality on a reef, settlement cues and habitat selection by coral larvae, and the facilitation and/or inhibition of coral growth and survival by crustose coralline algae. The models utilize data and observations made in the field and lab by Nichole Price and other MCR researchers. Earlier modeling work on space competition on heterogeneous landscapes also includes applications to benthic communities found in the Santa Barbara Coastal LTER site as well as at the coral reefs of the MCR site.

MCR LTER Participation:
MCR has provided funding for my research and collaborations through a mini-grant. The LTER has also facilitated collaborations with other researchers, including planned co-authorships for the papers produced as part of PhD research, interactions with researchers from other campuses, and access to data from field studies to be used in modeling. I also received support for attending the LTER ASM in 2006 where I presented a poster, which along with the MCR annual meeting provided many opportunities for sharing research results and ideas.

Conferences Attended:
LTER All Scientists Meeting, Estes Park, CO, 2006

Presentations:
Poster presentation, Space competition and regime shifts on structured landscapes. LTER All Scientists Meeting, 2006
Poster presentation, Space competition and regime shifts on structured landscapes. MCR LTER Annual Meeting, 2006

**Publications:**
Status: Ph.D. student, 3rd year  
Program: Biological Oceanography  
Current Advisor: James Leichter

Previous Education: 
B.S. Biology, University of California, Los Angeles 2002

Areas of Research: Population Dynamics, Food Web and Nutrient Dynamics, Physical-biological Coupling

Title of Graduate Research Project: 
ZOOPLANKTIVORY ON A CORAL REEF: INSIGHTS FOR THE ECONOMY OF AN ECOSYSTEM AND THE ECOLOGY OF A CORAL REEF

Project Description: 
My thesis research involves examination of island-scale spatial variability in the trophic ecology of a site-attached, zooplanktivorous coral reef fish. I am complementing traditional gut content analysis with stable isotope (C,N,S) and fatty acid analyses to elucidate dietary patterns of damselfish collected from fringing, lagoon, and fore reef zones around the island (sampling stations include the six LTER monitoring sites). Measurements of zooplankton flux across reef sites are made utilizing zooplankton collections coupled with ADCP measurements. The resulting island-scale patterns of food intake/food availability will be combined with growth, survivorship and physiological condition data to examine the implications of spatial variation in trophic interactions for the ecology of a zooplanktivorous damselfish.

MCR LTER Participation: 
I have benefited tremendously from my participation in the MCR LTER. Logistically, my field research was made possible by MCR infrastructure (boats, offshore moorings, laboratory space and equipment such as microscopes, balances, drying ovens, etc.). I will also benefit from use of the long-term oceanographic data collected by the LTER. LTER-affiliated researchers and staff (specifically Mike Murray, Keith Seydel, Andy Brooks, Alice Alldredge, Pete Edmunds, and Bob Carpenter) have provided significant input and guidance. This group has given me a wonderful introduction to Moorea both in terms of the logistics of working on the island and in terms of an increased understanding of the ecological setting and history of related scientific research at Gump. I enjoy attending working group and annual site meetings and find that these meetings, in addition to time spent in the field together, provide a sense of community between researchers and students and are excellent opportunities to receive input and exchange ideas. Interactions with other MCR LTER graduate students have been particularly helpful, and have widened my understanding of Moorea's reefs beyond knowledge gained through my own research.

Conferences Attended: 
ASLO Ocean Sciences, Honolulu, HI, 2006  
LTER All Scientists Meeting, Estes Park, CO, 2006  
Sustainable Development and Tropical Island Ecosystems, Moorea, 2006
Presentations:
Poster presentation, Spatial patterns in the mesozooplankton community of a French Polynesian reef. ASLO, 2006
Invited talk, A diverse approach to marine biodiversity: One student’s perspective on IGERT graduate training. ASLO, 2006

Publications:
CORINNE KANE  
Reef Check Foundation  
17575 Pacific Coast Highway  
Pacific Palisades, CA 90272  
Email: ckane@reefcheck.org

**Status:** M.A. student, Graduated  
**Program:** Ecology, Evolution, and Marine Biology  
**Advisor:** Sally Holbrook and Russell Schmitt

**Previous Education:**  
B.S. Aquatic Biology, University of California, Santa Barbara 2003  
M.A. Marine Ecology, University of California, Santa Barbara 2006

**Areas of Research:** Community Ecology, Population Dynamics

**Title of Graduate Research Project:**  
HABITAT PREFERENCE, SOCIAL BEHAVIOR AND PATTERNS OF ABUNDANCE IN THE CORAL REEF FISH *PARACIRRHITES ARCATUS*

**Project Description:**  
The role of habitat preferences and social organization in determining spatial distributions has been a much debated topic in ecology. To determine whether and how individual behavior and social organization influence spatial distributions of arc-eye hawkfish (*Paracirrhites arcatus*) on both local and lagoon-wide scales, a series of reef surveys and field experiments were conducted. Reef surveys revealed *P. arcatus* display strong preferences for branching corals in the genus *Pocillopora* and more specifically for certain morphological attributes within the group of *Pocillopora* species. These habitat preferences explained ~62% of the variation in abundance of this species on a lagoon-wide scale. This derived relationship between the numbers of hawkfish and *Pocillopora* predicted 86% of the spatial variation in abundance of hawkfish at other locations during the subsequent year. Individual behavior and social organization were also found to have significant impacts on hawkfish distributions. A colonization experiment established preferences of hawkfish for different types of *Pocillopora* in the absence of established social structures; all colonizers resided on the highly favored corals. While this experiment revealed strong preference for certain *Pocillopora* corals, surveys illustrate the majority of hawkfish do not reside on these preferred corals. To address this, another experiment examined the impact of social organization on hawkfish distribution. When highly preferred corals were added to areas occupied by established harems, hawkfish significantly modified the amount of time spent as well as the number of aggressive acts and prey attacks made from these corals. These results illustrate the critical need to investigate more thoroughly the impacts of individual behavior and social organization on spatial distributions.

**MCR LTER Participation:**  
I have participated in the MCR LTER on two different levels: one as a graduate student and one as a technician. I have been fully supported by the MCR LTER as a graduate student. The funding from this grant has provided full use of SCUBA equipment, housing, laboratory fees, boat usage and a part time assistant for summer field work and provided the majority of the funding for my master’s project. As a result of this funding, I have been able to devise and implement a solid thesis and graduate ahead of schedule. As a technician, I worked directly with several PIs as well as other technicians on the implementation and monitoring of fish survey sites at all 6 island locations. This position has granted
me unparalleled experience in the field and afforded me the opportunity to collaborate and work directly with many faculty members. This experience has greatly improved both employment and communication skills for future positions.

**Conferences Attended:**
Clean Oceans Conference, Kauai, HI, 2007  
ITMEMS 3, Cozumel, Mexico, 2006  
Western Society of Naturalists Annual Meeting, Monterrey, CA, 2005

**Presentations:**
JENNIFER LAPE
Island Conservation Center for Ocean Health
University of California
Santa Cruz, California 95060
Email: jen.lape@islandconservation.org

Status: M.A. student, Graduated
Program: Ecology, Evolution, and Marine Biology
Advisor: Russell Schmitt

Previous Education:
B.S. Marine Biology, University of California, Santa Cruz 2001
M.A. Ecology, University of California, Santa Barbara 2005

Areas of Research: Population Dynamics

Title of Graduate Research Project:
FACTORS INFLUENCING THE QUALITY OF A REFUGE FOR CORAL REEF FISH: EFFECTS OF MICROHABITAT SETTING, SIZE AND INHABITANTS

Project Description:
Species commonly associate with habitat structures that afford protection from predators. The quality of such refuges may be influenced by a variety of factors, including size and setting in the local habitat as well as the set of interactions that occur within the structures themselves. We explored whether these factors influenced the efficacy of a structural refuge for tropical reef fish. *Pocillopora eydouxi*, a common branching coral, harbors a suite of fish and invertebrate species in Moorea, French Polynesia. Survey data indicated that corals harboring the red-spotted coral crab (*Trapezia rufopunctata*) and/or predatory hawkfish (Cirrhitidae) had half the density of resident fish than corals lacking those two groups. A field experiment tested whether red-spotted coral crabs affected the mortality of young yellowtail dascyllus (*Dascyllus flavicaudus*) and assessed whether the influence of coral crabs depended on the presence of older conspecific fish. The experiment revealed that both coral crabs and older conspecifics increased mortality, but that their joint effects on mortality were additive. In addition, both slight variation in size of the shelter coral and its distance (within 6m) from the nearest natural patch reef (a local source of predators) affected mortality of young dascyllus. These findings (1) demonstrate that interactions among taxonomically disparate species can play a substantial role in shaping patterns of abundance and (2) highlight the fact that the quality of a shelter microhabitat can be influenced substantially by very fine-scale variation in its size and setting as well as by the combination of organisms that occupy it.

MCR LTER Participation:
I received MCR LTER funding to cover travel and expenses for trips to Moorea, and used LTER equipment and boats while conducting fish time-series surveys. My graduate research also benefited from interactions with network associated scientists and other students.

Conferences Attended:
University of California Toxics Substances Research and Training Annual Symposium, Sacramento, California, 2005
Western Society of Naturalists Annual Meeting, Rohnert Park, California, 2004
University of California Toxics Substances Research and Training Annual Symposium, San Diego, 2004
Western Society of Naturalists Annual Meeting, Monterey, California, 2003
University of California Toxics Substances Research and Training Annual Symposium, Oakland, California, 2003
Western Society of Naturalists Annual Meeting, Monterey, California, 2002
Monterey Bay Sanctuary Currents Symposium, Marina, California, 2002

**Presentations:**
Poster presentation, The influence of conspecifics and coral crabs (*Trapezia rufopunctata*) on the post-settlement mortality of a reef fish (*Dascyllus flavicaudus*). The Annual Symposium of the Western Society of Naturalists, 2004
Poster presentation, Environmental effects of a toxicant in the intertidal: Implications for gregarious settlers. University of California Toxics Substances Research and Training Annual Symposium, 2004

**Publications:**
MAIREAD E. MAHEIGAN
Department of Biology
California State University
Northridge, CA 91330
Email: maheigan@gmail.com

Your current status: M.S. student, 4th year
Degree Program: Biology
Current Advisor: Peter Edmunds

Previous Education:
B.S. Natural Resource Studies, University of Massachusetts Amherst 2002

Areas of Research: Population Dynamics, Disturbance Patterns, Physical-biological Coupling, Conservation and Management

Title of Graduate Research Project:
SPATIAL SCALE OF MORPHOLOGICAL VARIATION OF POCILLOPORA VERRUCOSA AND PORITES PORITES

Project Description:
Phenotypic plasticity in scleractinian corals has been widely studied; however the degree to which it exhibits spatial scale dependence has not been explored. The primary objective of my thesis was to determine if coral morphology varies among traits and across spatial scales. To test for spatial scales of morphological variation, skeletal traits of two corals, Pocillopora verrucosa in French Polynesia and Porites porites in the Virgin Islands, were quantified across spatial scales. Nine skeletal traits were quantified in 160 colonies of P. verrucosa across two shores, and principal components analysis (PCA) was used to collapse the data into fewer variables. Our findings show that corallum dimensions exhibited significant variation at a spatial scale of 100s of meters, and verrucae and corallite morphology varied significantly at a scale of 10s of meters. To test for spatial scale associations of morphological variation in P. porites, colonies were sampled along ~10 km of the southern coast of St. John. Corallum traits were quantified in 140 colonies, and traits were found to differ between sites. These studies provide evidence that the magnitude and range of morphological variation is not consistent among skeletal traits and spatial scales for P. verrucosa or P. porites. Following the quantification of morphological traits, verrucae of P. verrucosa were subjected to controlled flow speeds in a flume to explore the functional significance of this trait. Shear velocities around and above verrucae were experimentally estimated at two flow speeds, to test if verrucae influence rates of mass transfer at the coral surface. Our results suggest that verrucae do not influence shear velocities, and thus are unlikely to affect mass transfer on the scale of our experiment. These findings were consistent with previous studies that indicate that small skeletal features are less important than larger skeletal attributes in determining shear velocities above corals.

MCR LTER Participation:
During the past 3 years that I have been a graduate student in Dr. Edmund’s lab, I have had many opportunities through the support of the LTER and have gained experience in the design, logistics, implementation, analysis and dissipation of marine research. I have seen the fieldwork start from the ground up; our first days in Moorea were spent mixing cement to pour blocks for the LTER site moorings. For the past 3 years I have assisted with annual data collection and received RA support to analyze the photoquadrats back in the lab to determine coral community composition. I have also had
support, through the LTER, to complete research towards my MS thesis. Additionally, my work was improved through the opportunity to use a flume, which was brought to Moorea to support the work of Dr. Carpenter, a PI on the MCR LTER. Travel costs, housing, and lab fees were covered by the LTER during Dr. Edmund’s research trips, during which I was given time to complete my own research and supported to use facilities and equipment at GUMP. LTER personnel, Keith Seydel, Mike Murray and Andy Brooks were always helpful either to make things work in the field or answering questions to help the science run smoothly. I have also been supported to attend several scientific meetings and present my research from Moorea, and to interact with numerous scientists from the LTER network both at meetings and in the field.

**Conferences Attended:**
- Benthic Ecology Conference, Atlanta, GA, 2007
- LTER All Scientists Meeting, Estes Park, CO, 2006
- Benthic Ecology Conference, Quebec, Canada, 2006
- Western Society of Naturalists Annual Meeting, Monterey, CA, 2005

**Presentations:**
- Invited talk, Spatial scale dependence of morphology of *Pocillopora verrucosa* in Moorea, French Polynesia. LTER All Scientists Meeting, 2006
- Invited talk, Variation in morphological traits of the common Pacific reef coral *Pocillopora verrucosa* at different spatial scales. Western Society of Naturalists Annual Meeting, 2005
- Invited talk, Variation in morphological traits of the common Pacific reef coral *Pocillopora verrucosa* at different spatial scales. California State University, Northridge Research Symposium, 2005
NANCY MUEHLLEHNER
Biology Department
California State University
Northridge, CA, 91330
Email: nancymuehllehner@gmail.com

Status: M.S. student, 2nd year
Program: Biology
Current Advisor: Peter Edmunds

Previous Education:
B.S. Education, University of Delaware 1996
M.A. Secondary Science Education, University of California, Berkeley 2000

Areas of Research: Physical-biological Coupling, Coral Ecophysiology

Title of Graduate Research Project:
THE EFFECTS OF INCREASING CARBON DIOXIDE ON THE CALCIFICATION RATE, LINEAR EXTENSION RATE AND MORPHOLOGY OF REEF CORALS

Project Description:
Global climate change poses serious threats to the tropical reef ecosystem. As carbon dioxide levels rise in both the atmosphere and the ocean, it becomes energetically more challenging for scleractinian corals to deposit calcium carbonate, the basis for the reef ecosystem. The morphological effects of changes in mass deposition are not easily predicted as the mass deposition of aragonite and colony morphology are coupled only loosely. This study used manipulative experiments to examine the effects of pCO₂ on mass deposition (mg day⁻¹) and linear extension (μm day⁻¹) of Acropora hyacinthus to test the hypothesis that there is a trade-off between these traits in their response to pCO₂. The results show that both are affected, with linear extension more so than mass deposition. The decoupling in the response of these two growth parameters to increasing CO₂ could impact the predictions of coral reef decline due to climate change.

MCR LTER Participation:
As a master’s student of Dr. Peter Edmunds, I have benefited greatly from his involvement in the MCR LTER. I have accompanied Dr. Edmunds into the field for two 6 week field seasons, which have allowed me to participate in a variety of data collection methods as well as the opportunity to complete my own thesis research. The facilities, lab equipment and technicians working with the MCR LTER enabled the creation of an experimental design with the level of sophistication necessary to create microcosms for studying coral growth rates under various climate change simulations. Additionally, my participation in the greater MCR LTER community has exposed me to a multitude of intelligent, cutting-edge researchers who have provided valuable advice along with sharing oceanographic data, such as the current carbonate parameters occurring in Moorea.

Conferences Attended:
Benthic Ecology Conference, Atlanta, GA, 2007
Western Society of Naturalists Annual Meeting, Seattle, WA, 2006
Presentations:
Invited talk, The effects of increasing carbon dioxide on coral skeletal growth: Tall and porous or short and dense? Emeritus Luncheon, 2007
Invited talk, The effect of increased carbon dioxide on the calcification rate, linear extension and morphology of reef corals. Student Research Symposium, 2006
Invited talk, The effect of increased carbon dioxide on the calcification rate, linear extension and morphology of reef corals. All-Investigator Meeting, 2006
Status: Ph.D. student, 2nd year
Program: Oceanography
Current Advisor: Ruth Gates

Previous Education:
B.S. Oceanography, Universidad Autónoma de Baja California, Mexico 2001
M.S. Biology, California State University, Northridge 2005

Areas of Research: Population Dynamics, Physical-biological Coupling

Title of Graduate Research Project:
FIELD STUDIES IN CORAL REPRODUCTION AND SEDIMENTATION EFFECTS ON CORAL BIOLOGY

Project Description:
Sedimentation, as a result of both natural processes and human activities, can be one of the main drivers of reef degradation. The accumulation of sediment on coral tissue is known to reduce metabolic and tissue growth rates of coral, increasing the probability of bleaching and coral death. My research seeks to understand how coral physiology and reproduction are affected by sedimentation in Moorea, French Polynesia. Information from this study will be directly disseminated to resource managers and used to focus conservation efforts to protect coral populations against sedimentation. In addition, reproductive fitness may be a sensitive indicator of stress in corals and thus a useful tool for monitoring coral reefs with utility in designing future ecological risk assessments in coral reef ecosystems.

MCR LTER Participation:
The MCR LTER has offered me a unique opportunity for my research and professional development. Having the chance to work in Moorea (with MCR LTER support) has provided me with the tools necessary to perform high-quality research in coral ecophysiology. Specifically, access to lab space, boats, SCUBA, field and lab equipment (and supplies) has been essential to my research. Additionally, the support of LTER technicians has significantly contributed to my research experience in Moorea. LTER techs have been very useful in activities such as boat training, general troubleshooting with lab/field equipment and field support. Furthermore, participating as a LTER graduate student has allowed me to interact with LTER and non-LTER students and scientists, this has been an incredible experience because I have been able to collaborate with other students and learn from their study systems and research questions.

Conferences Attended:
STAR Student Symposium, Honolulu, HI 2006
Western Society of Naturalists Annual Meeting, Long Beach, CA, 2004
Friday Harbor Labs Centenary Symposium, Friday Harbor, Washington, 2004
Ecological Society of America Meeting, Portland, Oregon, 2004
Benthic Ecology Conference, Orlando, FL, 2002
International Workshop of Tourism in the Caribbean, Quintana Roo, Mexico, 2001
Student Congress of Oceanography, Ensenada, Mexico, 2000

Publications:

**ABIGAIL PORAY**  
Department of Biology  
California State University  
Northridge, CA, 91330  
Email: abigail.poray@yahoo.com

**Status:**  
M.S. student, 1st year

**Program:**  
Marine Biology

**Current Advisor:**  
Robert C. Carpenter

**Previous Education:**  
B.S.  
Wildlife and Fisheries Conservation, University of Massachusetts  2004

**Areas of Research:**  
Primary Productivity, Population Dynamics, Physical-biological Coupling

**Title of Graduate Research Project:**  
DISTRIBUTION AND PHYSIOLOGICAL CONSEQUENCES OF MACROALGAE INHABITING REFUGIA FROM HERBIVORES

**Project Description:**  
Spatial heterogeneity within habitats can provide refugia for prey by limiting their accessibility to predators. Because coral reefs in Moorea, French Polynesia have high levels of herbivory, many macroalgal species are limited in their distribution to available microhabitats, such as crevices in coral bommies and areas between closely-spaced branching corals. However, the physical characteristics in these microenvironments, such as water flow and light flux, may have physiological consequences for these macroalgae. The focus of this study is to isolate the underlying mechanisms that lead to the utilization of these microhabitats and the physiological consequences that result. Primarily, I will address the role of herbivory, environmental stresses and resource availability in affecting the productivity and competitive abilities of macroalgae as important space occupiers. At present, preliminary survey data have identified the general distribution of macroalgae present within an array of microhabitats. Further measurements will quantify the physical characteristics of the various microhabitats as well as the quantification of photosynthetic performance and competitive potential of macroalgae confined to these environments. Developing such a framework of factors that influence the dynamic structure of macroalgae in Moorea will be important in understanding and predicting ecological shifts in the coral reef community.

**MCR LTER Participation:**  
As a graduate student affiliated with the MCR LTER project, I have been provided with a variety of assets and research tools. In particular, at the lab station in Moorea, an extensive list of equipment, supplies and facilities has been made available. Such items (many of which are beyond my budget) as a Diving PAM, electronic scales, ovens, transportation to field sites, shop tools, lab space, etc. are important in developing an achievable, high-quality project. In addition, and most importantly, the MCR LTER has provided a setting for building a network and gaining exposure to various colleagues and researchers in the field. Though my interactions with collaborators and exposure during meetings and conference opportunities, I hope to open up many doors that will continuously help to establish me professionally.

**Conferences Attended:**  
Benthic Ecology Conference, Atlanta, GA, 2007
NICOLE N. PRICE  
Ecology, Evolution, and Marine Biology  
University of California  
Santa Barbara, CA 93117  
Email: n_price@lifesci.ucsb.edu

**Status:** Ph.D. student, 5th year  
**Program:** Marine Ecology  
**Current Advisor:** Russell Schmitt

**Previous Education:**  
B.A. General Biology, Connecticut College  2000  
M.A. Applied Statistics, University of California, Santa Barbara  2007

**Areas of Research:** Population Dynamics, Physical-biological Coupling, Physical and Ecological Modeling

**Title of Graduate Research Project:**  
CONSEQUENCES OF CHEMICAL CUES: COMMUNITY STABILITY AND RESILIENCE

**Project Description:**  
Settlement preferences of sessile invertebrates may be adaptations to local community interactions, particularly if selection of appropriate microhabitat influences early post-settlement survivorship. Corals are induced to settle by chemical cues in the cell walls of crustose coralline algae (CCA). The availability of cue-containing CCA may influence local recruitment rates of reef-building corals. My dissertation examines a/biotic factors influencing the abundance and distribution of CCA, which then may influence coral spat survivorship. Results of a field coral recruitment experiment indicate that Pocilloporid corals exhibit a hierarchical selection for substrate among seven CCA species. Electivity indices for coralline algal species with thin crusts (*Titanoderma prototypum*) are significantly greater than for species with thicker thalli (e.g., *Porolithon onkodes*). Pair-wise field competition experiments revealed that thick-crusted coralline species are superior space competitors when exposed to transient herbivores. CCA producing thin thalli are susceptible to grazing and are abraded more frequently in field caging experiments. Pocilloporid corals select to settle upon CCA species exhibiting particular morphological characteristics that may influence the survival and growth of spat. In fact, coral survivorship and growth positively correlate with thinness of crust and selectivity indices. Thus, CCA that are weaker competitors for space and cannot withstand biotic disturbances may indicate microhabitats that are most suitable for recruitment of reef-building corals.

**MCR LTER Participation:**  
Although the MCR LTER was initiated two years after I started my dissertation research, I am able to participate in and greatly benefit from this program. I have attended and presented at both the MCR LTER annual meetings and received and contributed informative feedback to other LTER investigators and graduate students (from Cal State Northridge and UC San Diego) with whom I would not have otherwise been able to interact. Some of these discussions have led to collaborations in the field. In particular, I conducted experimental manipulations in the field with Hannah Stewart, who holds an MCR LTER post doctoral position, and we are currently preparing a paper for submission. I am also an active member in two of the MCR LTER working groups: Coral Functional Biology and Bio-Physical Coupling. Currently, I am fine-tuning a novel coral recruitment monitoring technique that may be applied in projects stemming from both groups. These collaborative interactions have led to lasting
relationships with researchers from other institutions. Dr. Peter Edmunds (co-PI of the MCR LTER from CSUN) is now a member of my PhD committee at UCSB. Recently, we participated in a collaborative exchange with Dr. Tung-Yung Fan, an associate research fellow directing the Coral Lab at the Kenting Coral Reef ILTER site in Kenting, Taiwan. I am currently developing ideas to submit a proposal for future funding to revisit Dr. Fan in Taiwan and continue collaborative work between the two LTER sites. Besides providing opportunities to interact with other researchers, the MCR LTER has also provided the necessary infrastructure for the successful completion of my dissertation. In particular, I have extensively used facilities, microscopes, and boats provided by the LTER funding. The MCR LTER paid for both the air fills for SCUBA tanks and fuel for the boats that I’ve used in the past two years. With technical support from Keith Seydel, operation of the boat engines and compressor ran smoothly and uninterrupted (a rare feat in the field). Even small details are covered by funding from the MCR LTER: poster printing costs are alleviated using this source. The MCR LTER has provided solid infrastructure and unique opportunities for my research and professional development that will carry into the next stage of my academic career.

Conferences Attended:
MCR LTER Annual Meeting, Santa Barbara, CA, 2006
Ecology, Evolution, and Marine Biology Graduate Student Symposium, Santa Barbara, 2006
Western Society of Naturalists Annual Meeting, Monterey, CA, 2005
MCR LTER Annual Meeting, Santa Barbara, CA, 2005
Ecology, Evolution, and Marine Biology Graduate Student Symposium, Santa Barbara, 2005
Western Society of Naturalists Annual Meeting, Long Beach, CA, 2004
Ecology, Evolution, and Marine Biology Graduate Student Symposium, Santa Barbara, 2004

Presentations:
Invited talk, Settlement rates and substrate preference for P. damicornis and S. pistillata. NMMBA Coral Lab and MCR LTER Joint Meeting, Taiwan, 2007
Invited talk, Do coralline algae influence coral recruitment? NMMBA Coral Lab, 2007
Invited talk, Do Trapezia crabs influence early Pocillopora population dynamics? MCR LTER All Scientists Symposium, 2007
Poster presentation, Do coralline algae influence coral recruitment? LTER All Scientists Meeting, 2006
Invited talk, Do competitive trade-offs among coralline algae influence post-settlement survivorship of Pocilloporid spat? MCR LTER All Scientists Symposium, 2006
Guest lecturer, Module: Open Populations: Rockfish dynamics on the Northern Channel Islands. UC Santa Barbara Applied Marine Ecology, 2006
Guest lecturer, Module: Open Populations: Rockfish dynamics on the Northern Channel Islands. UC Santa Barbara Applied Marine Ecology, 2005
Guest lecturer, Module: Experimental Design. UC Santa Barbara Applied Marine Ecology, 2005
Invited talk, Substrate selection and post-settlement survivorship in Pocilloporid corals. UC Santa Barbara Ecology, Evolution, and Marine Biology Graduate Student Symposium, 2005
Invited talk, Substrate selection and post-settlement survivorship in Pocilloporid corals may be predetermined by cue availability. Western Society of Naturalists Annual Meeting, 2005
Guest lecturer, Global climate change and El Niño Southern Oscillation (ENSO) events: environmental and biological trends. UC Santa Barbara Applied Marine Ecology, 2004
Publications:


HOLLIE PUTNAM  
Department of Biology  
California State University  
Northridge, CA 91330  
Email: hollieputnam@gmail.com

**Status:** M.S. student, 2nd year  
**Program:** Biology  
**Current Advisor:** Peter Edmunds

**Previous Education:**  
B.S. Biology and Broad Field Science, University of Wisconsin-Superior 2004

**Areas of Research:** Physical-biological Coupling, Coral Eco-Physiology

**Title of Graduate Research Project:**  
PHYSIOLOGICAL RESPONSE OF CORAL TO ENVIRONMENTALLY RELEVANT FLUCTUATIONS IN THERMAL SURROUNDINGS

**Project Description:**  
The seawater flowing over coral reefs undergoes changes in abiotic conditions on a scale of seconds to hours, but little is known regarding the biological effects of such variation. More specifically, variation in seawater temperature creates a heterogeneous environment with potentially important consequences for reef corals. The purpose of this study is to test the effects of such fluctuations on coral physiology, with the larger goal of understanding how corals transduce fine-scale abiotic signals into organismal performance.

**MCR LTER Participation:**  
The MCR LTER has facilitated the majority of my work as a MS student. Through work as a research assistant for Dr. Peter Edmunds, I have been able to travel to Moorea and aid in the LTER site establishment, time-series data collection, and analysis. At the same time, I was able to complete experiments for my thesis research. This work was made possible by utilizing LTER equipment such as boats, SCUBA equipment, tools, and tank equipment (heaters, chillers, pumps, tanks, transformers, etc.) Response variables were measured using LTER lab equipment such as sonicator, centrifuge, microscopes, computers, and cameras. I also had lab and field support from Mike Murray and multiple grad students from CSUN who were also supported in the field with LTER funds. In addition, I have been able to interact with other LTER funded researchers (i.e., committee member Dr. James Leichter), and utilize the time-series data gathered on physical factors such as light and temperature. My interactions also extend to collaborative work with Dr. Tung-Yung Fan of the Kenting ILTER in Taiwan.

**Conferences Attended:**  
Western Society of Naturalists Annual Meeting, Seattle, WA, 2006  
LTER All Scientists Meeting, Estes Park, CO, 2006

**Presentations:**  
Invited talk, Physiological response of scleractinian corals to a highly variable thermal environment.  
National Museum of Marine Biology and Aquarium, Taiwan, 2007
Invited talk, Physiological response of scleractinian corals to a highly variable thermal environment. CSUN Research and Creative Works Symposium, 2006
Invited talk, Does frequent variation matter? Physiological response of scleractinian corals to a highly variable thermal environment. Western Society of Naturalists, 2006
Poster presentation, Physiological response of scleractinian corals to high frequency temperature fluctuations. LTER All Scientists Meeting, 2006
Your current status: M.S. student, 1st year
Degree Program: Biology
Current Advisor: Robert Carpenter

Previous Education:
B.S. Biology, Northeastern University 2004
Minor Marine Biology, Northeastern University 2004

Areas of Research: Population Dynamics, Physical-biological Coupling

Title of Graduate Research Project:
VARIATION IN POPULATION DYNAMICS BETWEEN TWO TROPICAL FUCOIDS IN A PATCHY REEF ENVIRONMENT AND THEIR DIFFERENTIAL IMPACTS ON CORALS

Project Description:
Backreef habitats in Moorea, French Polynesia are dominated by two macroalgal species; Sargassum mangarevense and Turbinaria ornata. Herbivory and interspecific competition for space are two ecological processes driving the demography of these populations. This habitat is dominated by coral heads or ‘bommies’ on the tops of which the majority of macroalgae are found. This patchy environment creates metapopulations that provide spatial refuge from herbivory and may limit the dispersal of algal propagules from one bommie to another. In the past eighteen months, there has been a noticeable decline in abundance of S. mangarevense. This ‘decline’ may be a result of natural temporal fluctuations, increased herbivore pressure or efficient space holding of T. ornata. Changes in the dominant algal species within these reef communities may be based on the success of annual recruitment, the holding of space by perennial holdfasts and/or differential impacts of herbivory. A change in dominance of algal species may have adverse effects on community structure, differentially affecting coral recruitment and survival. Implications of species interactions are important for the monitoring of both coral abundance and reef diversity which are important to overall reef health and sustainability.

MCR LTER Participation:
I have been a part of the MCR LTER since 2005, when I began helping Dr. Carpenter set up the initial transect poles and sites around Moorea. At that point, I was between my undergraduate and graduate careers, looking to gain research experience in the field. I have been to Moorea three times since, continuing to assess herbivore abundances at each of the LTER MCR sites. I am now a first year graduate student with Dr. Carpenter and have been provided the opportunity to begin my own research in Moorea. This would not be possible were it not for the funds providing airfare, room and board for my past and future trips and access to lab and field supplies including boats, fuel and Rovers.

Conferences Attended:
Benthic Ecology Conference, Atlanta, GA 2007
Presentations:
STEPHANIE TALMAGE
Department of Biology
California State University
Northridge, CA 91330
Email: stepht26@yahoo.com

Status: M.S. student, Graduated
Program: Biology
Current Advisor: Robert C. Carpenter

Previous Education:
B.S. Earth Systems, Cornell University 2004
M.S. Biology, California State University, Northridge 2007

Areas of Research: Marine Ecology, Population Dynamics, Algal Biology, Algae-herbivore Interaction

Title of Graduate Research Project:
VARIATION IN ABUNDANCE AND CARBON ALLOCATION FOR SAGASSUM MANGAREVENSE ACROSS GRADIENTS IN HERBIVORY AND HYDRODYNAMIC EXPOSURE IN MOOREA, FRENCH POLYNESIA

Project Description:
Optimal resource allocation across gradients in environmental conditions can determine the distribution of aquatic organisms. This study addressed how water motion and herbivory can alter the distribution and responses of a tropical macroalgal species. Maximum water flow was estimated in three reef habitats (reef crest, back reef, and fringing reef) using dynamometers. 

Sargassum mangarevense abundance, growth rates, herbivore abundances, and grazing intensity were estimated across habitats. Both the abundance and growth rates of Sargassum were highest on the reef crest where herbivore abundance and grazing intensity were reduced. Holdfast tenacity and stipe strength were greatest in the back reef. An echinoid feeding assay suggested that algal thalli from the reef crest were the most preferred despite high phlorotannin levels in reef crest and back reef thalli. Fertility was highest on the fringing reef, and then switched to the reef crest suggesting a seasonality effect. The amount of carbon allocated to stipe and holdfast structures was highest in back reef habitats, while allocation to receptacles was highest in the fringing reef habitats. These results suggest that this seaweed allocates resources differentially across gradients in herbivory and hydrodynamic exposure, and that trade-offs between life functions are habitat-specific.

MCR LTER Participation:
The MCR LTER has been influential during my time at California State University Northridge, and since. During my time working on my master’s research in Moorea, I was supported through the MCR LTER on numerous occasions. None of my research would have been possible without the facilities at Gump research station (lab space and housing). The technical support team of both Michael Murray and Keith Seydel aided my research experiences during many of my stints in the field. The MCR LTER network has funded all of my travel expenses to Moorea for my research and for the research trips where I helped other principle investigators in their research goals. Through LTER support, I was also able to attend the LTER all scientists meeting where I engaged with other LTER students from across the country. I will soon be in the process of coauthoring two manuscripts on research conducted during my time at CSUN, and I am now beginning a PhD program at SUNY Stony Brook. The MCR LTER
network was completely supportive during my time affiliated with them and throughout my career advances.

Conferences Attended:
Western Society of Naturalists Annual Meeting, Seattle, WA, 2006
LTER All Scientists Meeting, Estes Park, CO, 2006
Western Society of Naturalists Annual Meeting, Monterey, CA, 2005
Benthic Ecology Meeting, Williamsburg, VA, 2005

Presentations:
Invited talk, Variation in Abundance and Carbon Allocation for *Sargassum mangarevense* across Gradients in Herbivory and Hydrodynamic Exposure in Moorea, French Polynesia.  Western Society of Naturalists Meeting, 2006
Poster presentation, Variation in abundance and carbon allocation for *Sargassum mangarevense* across gradients in herbivory and hydrodynamic exposure in Moorea, French Polynesia.  LTER All Scientists Meeting, 2006
Invited talk, Patterns of abundance of *Sargassum mangarevense* across hydrodynamic and herbivory gradients in Moorea, French Polynesia.  Western Society of Naturalists Meeting, 2005
Poster presentation, Effects of productivity potential, hydrodynamic stress, and herbivory on resource allocation by subtidal macroalgae.  Marine Benthic Ecology Meeting, 2005

Publications:

ANNIE YAU
Bren School of Environmental Science and Management
University of California
Santa Barbara, CA  93106
Email: ayau@bren.ucsb.edu

Status: Ph.D. student, 2nd year
Program: Environmental Science and Management
Current Advisor: Hunter Lenihan

Previous Education:
B.S.  Marine Biology, University of California, Los Angeles    2004

Areas of Research: Population Dynamics, Disturbance Patterns, Physical-biological Coupling, Physical and Ecological Modeling

Title of Graduate Research Project:
POPULATION DYNAMICS OF GIANT CLAM (TRIDACNA MAXIMA) AND THE EFFECTS OF AN ARTISANAL FISHERY

Project Description:
Giant clams are brightly colored bivalves that burrow into coral reefs throughout tropical waters worldwide. Like corals, these unique bivalves form a symbiosis with zooxanthellae, and thus are mixotrophs with two potential carbon sources: filter feeding and photosynthate from symbionts. But unlike corals, giant clams do not die when they bleach, presumably because they can switch to their second carbon source. Thus giant clams may switch their reliance on a carbon source based on different environmental conditions. An individual-based population model for the species of giant clam (Tridacna maxima) in the lagoons of Moorea, French Polynesia will be built using data gathered from the field, experimental manipulations, and aquaculture literature. The model will be used to determine sensitivity of population growth to different biotic and abiotic parameters, each of which differentially affects the two carbon inputs. Current artisanal fishing pressure in Moorea will also be characterized and incorporated into the model, informing management of this culturally and economically significant species. This model and the data gathered to build the model will yield insight into giant clam biology, symbiosis, and population dynamics.

MCR LTER Participation:
The MCR LTER has provided excellent facilities for my thesis work, including a fully equipped field station with a wet lab, dry lab, boats and vehicles, and miscellaneous tools and equipment such as shop tools and boat safety equipment. The technicians provided by the LTER also help to ensure that field seasons run smoothly, and they take care of equipment maintenance and repair so that research can continue. The MCR LTER also provided a forum to present my preliminary findings (the MCR LTER Annual Meeting), and financially supports poster printing costs. I have also interacted with other MCR LTER investigators, some of which are on my committee, and received valuable input on my research. I plan to utilize some shared LTER oceanographic data in my research.

Conferences Attended:
California Association of Bilingual Educators Annual Conference, Long Beach, CA, 2007
MCR LTER Annual Meeting, Santa Barbara, CA, 2006
California and the World Ocean Annual Conference, Long Beach, CA, 2006

83
Western Society of Naturalists Annual Meeting, Monterey, CA, 2005

**Presentations:**
Poster presentation, Abundance and distribution of giant clam (*Tridacna maxima*) populations in Moorea, French Polynesia. MCR LTER Annual Meeting, 2006
Poster presentation, Natural history of a cloud forest crab. Annual Monteverde Institute International Symposium, 2003

**Publications:**
Appendix VII. List of MCR Field and Laboratory Equipment

Major instruments and equipment of the MCR LTER Site purchased with funding from the Gordon and Betty Moore Foundation, except for items with an asterisk, which were purchased with NSF funds.

**RESEARCH BOATS & VEHICLES**

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<td>Trailer</td>
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**OCEANOGRAPHIC INSTRUMENTATION**

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MCR Field and Laboratory Equipment (continued)

**LABORATORY INSTRUMENTATION & EQUIPMENT**

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