

Serena M. Moseman

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EDUCATION

- Ph.D., Biological Oceanography**, expected June 2008
Scripps Institution of Oceanography
- M.S., Oceanography**, 2003
Scripps Institution of Oceanography
- B.S., Biology** (Ecology, Behavior, and Evolution), 2002
U.C. San Diego, *Summa Cum Laude*

DISSERTATION

“Interactions between vascular plants and nitrogen-fixing bacteria in southern Californian wetlands: The role of microbial diversity and anthropogenic disturbances”

- Characterization of environmental controls on the activity and diversity of nitrogen-fixing microbes in coastal salt marshes across a range of spatial and temporal scales
- Evaluation of pathways for nitrogen transfer via plant-microbe interactions
- Functional comparison of natural, disturbed, and restored wetland ecosystems

Selected technical skills:

- acetylene reduction assays and analyses with FID-equipped gas chromatograph
- genetic fingerprinting (Terminal Restriction Fragment Length Polymorphism) techniques with the *nifH* gene (encoding dinitrogenase reductase)
- ¹⁵N₂ isotopic enrichment studies tracing paths of fixed nitrogen in mutualistic interactions between plants and microbes

Publications

Moseman, S.M., Johnson, R. and R. Zhang. 2007. Functional disparities in nitrogen fixation between natural and restored Mediterranean marshes, *in prep.*

Moseman, S.M., Zhang, R., and P.Y. Qian 2007. Environment and diversity buffer function of nitrogen fixers against biological invasions (two trees and one mussel), *in prep.*

Moseman, S.M. 2007. Opposite diel patterns of nitrogen fixation associated with salt marsh plant species (*Spartina foliosa* and *Salicornia virginica*) in southern California. *Marine Ecology* 28(2): 276-287.

Moseman, S.M., Levin, L.A., Currin, C.A., and C. Forder. 2004. Infaunal colonization, succession and nutrition of macrobenthic assemblages in a restored wetland at Tijuana Estuary, California. *Estuarine Coastal and Shelf Science* 60: 755-770.

ACADEMIC HONORS AND AWARDS

U.C. President's Dissertation Year Fellow (2007-2008, \$18,490)
 National Oceanic and Atmospheric Administration, National Estuarine Research Reserve Graduate Research Fellow (2005-2007, \$60,000)
 National Science Foundation Graduate Research Fellow (2003,04-06, \$90,000)
 Mildred Mathias Graduate Research Fellow (U.C. Natural Reserve System)
 Kendall Frost Marsh Reserve (2005, \$2500)
 Mia Tegner Memorial Fellow (2004, \$3000)
 Michael Mullin Fund research grant recipient (2003, \$1500)
 Minority Access to Science Engineering and Mathematics Fellow (2002-2004, \$18,000 plus tuition and fees)
 Sigma Xi Grant-in-Aid of Research recipient (2003, \$1,000)
 Eugene Cota-Robles Fellow (2002-2003, \$18,000 plus tuition and fees)
 U.C. San Diego Environment and Sustainability Initiative
 First place for graduate student research in sustainability (2007, \$1,000)
 Society for the Advancement of Chicanos and Native Americans in Science
 Best graduate student oral presentation in Marine Biology (2006, \$500)

TEACHING EXPERIENCE

Guest Lecturer, Scripps Institution of Oceanography
 Wetland Ecology, Conservation and Management
 -"The mighty role of microbes in wetland biogeochemistry" (2007, 2003)
 Biological Interactions-Symbiotic Partners
 -"Symbiotic nitrogen fixation" (2006)
 Classics in Ecology Seminar
 -"Finding Nitrogen: the microbes that do this for wetland plants and all the rest of the earth" (2006)

Guest Lecturer, U.C. San Diego Summer Bridge Program (2003-2005)
 -"Introduction to the southern California rocky intertidal zone"

Senior Teaching Assistant, Scripps Institution of Oceanography (2007-present)
 - Develop first departmental standards for graduate teaching assistants in lecture and laboratory courses offered in marine science at U.C. San Diego
 -Train new teaching assistants at Scripps Institution of Oceanography

Co-instructor, California State Summer School for Mathematics and Science
 COSMOS: The Living Oceans and Climate Change summer course (2006)

- Created college preparatory course syllabus for The Living Oceans
- Designed and implemented laboratory and field exercises including:
 - Construction, deployment, and inspection of larval settlement array
 - Examination and student presentation of deep sea specimens
 - Internet research on marine protected area case studies
- Lectured on topics of benthic intertidal ecology, deep sea biology, larval dispersal, marine protected areas and conservation
- Facilitated independent research projects and presentations

Senior Teaching Assistant Consultant, U. C. San Diego, Center for Teaching Development (2005- 2007)

- Developed and led workshops for teaching assistants and consultants including “Preparing Statements of Teaching Philosophy” (2006-2007) and “Leading Science Sections” (2005-2006)
- Reviewed and edited case studies of teaching assistant evaluations

Workshop Presenter, Expanding Your Horizons Youth Conference (2004- 2006)

- Designed and led oceanography workshops:
 - “Marine Biodiversity: From Shores to Seeps”
 - “Oceanography Internet lab”

Math and Science Facilitator, Summer Bridge Program at U.C. San Diego (2002)

- Instructed 20 students daily in a math and biology-based college preparatory program

Teaching Assistant Consultant, U.C. San Diego, Center for Teaching Development (2001- 2002)

- Observed, evaluated, and consulted with teaching assistants

Teaching Assistant, U.C. San Diego, Biology Department

Biodiversity (2002), Evolutionary and Organismic Biology (2001, 2002)

RESEARCH EXPERIENCE

International Collaborations

Scripps Institution of Oceanography SEDiment (SIOSED) in Venice, Italy
(June 2006)

- Assisted with sampling of benthic communities and studies of trophic interactions in salt marshes of Venice Lagoon
- Compared nitrogen fixation rates between natural and restored marshes

Hong Kong University of Science and Technology, Coastal Marine Laboratories (Jan. 2006)

- Studied genetic fingerprinting techniques with *nifH* gene under guidance of Dr. Rui Zhang and Dr. Pei Yuan Qian
- Introduced Dr. Rui Zhang to acetylene reduction techniques

Research Cruise Participation

- R/V Atlantis, Chief PI Ray Lee, Washington State University** (August 2007)
- Studied macrofauna and microbes at deep sea hydrothermal vents of the Juan de Fuca Ridge
- Johnson Sea Link (Harbor Branch Oceanographic), Chief PI Robert Carney, Louisiana State University** (August 2003)
- Collected and preserved methane seep sediments from the Gulf of Mexico

Undergraduate Researcher, Biological Oceanography laboratory of Dr. Lisa A. Levin (June 2001-June 2002)

- Studied community composition and diversity of macrofaunal invertebrates in Tijuana Estuary
Selected technical skills: Multidimensional scaling analyses with Primer, family-level invertebrate identification, dissecting and compound microscopy
- Oral presentation of research at U. C. San Diego's Undergraduate Research Conference (2001) and the national Benthic Ecology Meeting (2002)

MENTORING EXPERIENCE**Graduate Student Advocate**, Summer Training Academy of Research in the Sciences (STARS), U.C. San Diego (June 2007-August 2007)

- Mentored 5 undergraduates conducting research at SIO
- Designed and conducted weekly workshops on science research, data analysis, writing and presentation
- Facilitated student-faculty interactions

Research Mentor for Rebecca Johnson, **Environmental Systems Department**, U.C. San Diego (Fall 2005-Spring 2006)

- Intern won nomination to present research at U.C. San Diego's Undergraduate Research Conference (2006)

Recent presentations

- **Loyola Marymont University Seminar** (2007)
"Seeing the Invisible: Activity and diversity of nitrogen fixing bacteria in coastal wetlands"
- **Research in Sustainability at UC San Diego Earth Week** (2007)
"Unraveling threats of coastal sedimentation: Indications for conservation from nitrogen-fixing microbes"
- **Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)**, 2006
"Wading in wetlands and diving to seeps (in pursuit of a Ph.D.)"
- **International Society of Microbial Ecology** (2006)

- “Interactions between nitrogen-fixing microbes and the Pacific cordgrass (*Spartina foliosa*) in a natural and restored salt marsh of Tijuana Estuary, CA” (poster presentation)
- **American Society of Limnology and Oceanography** (2006)
 - “Diversity and activity of nitrogen fixers in a natural and restored *S. foliosa* marsh of Tijuana Estuary (CA)”
 - **International Conference on Safe Water** (2005)
 - “Marine Wetlands and Water Quality: The San Dieguito Lagoon”

UNIVERSITY AND COMMUNITY SERVICE

- Focus Group Member**, U.C. San Diego peer networking program
 Graduates United in the Interests of Diversity and Excellence (G.U.I.D.E.)
 (Spring 2007- present)
- Revise scope and format of the social network to emphasize diversity
 - Plan programming to provide professional, academic, and personal development for graduate students
 - Negotiate incentives for graduate student participants

- Graduate Student Representative and Founding Member**, SIO Diversity Team (2004-present)
- Promote SIO at national conferences (SACNAS, ASLO)
 - Encourage students of diverse backgrounds to pursue graduate studies
 - Suggest effective outreach, recruitment, and retention strategies to the committee

- Founding Member**, Raza Graduate Student Association, U.C. San Diego
 (2003-present)
- Organize annual Bienvenida celebrations to honor individuals that support diversity in U.C. San Diego graduate programs
 - Promote retention and building a community for underrepresented graduate students through cultural enrichment and social interactions

Organizer of Ecology seminar series, Scripps Institution of Oceanography (Winter 2004)

- Aquarium Volunteer**, Birch Aquarium at Scripps
- Public tide pool interpreter and aquarist assistant (September 1997- June 2003)

PROFESSIONAL SOCIETIES

International Society of Microbial Ecology
 American Society of Limnology and Oceanography
 Society for the Advancement of Chicanos and Native Americans in Science
 Ecological Society of America

REFERENCES

Dr. Lisa A. Levin

Graduate advisor, Biological Oceanography

Scripps Institution of Oceanography
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Dr. Lihini Aluwihare

Assistant Professor, Geosciences Research Division

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Dr. Russ Chapman

Executive Director, Center for Marine Biodiversity and Conservation

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