

Serena M. Moseman
 U.S.G.S. Mendenhall Postdoctoral Research Fellow
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EDUCATION

Ph.D., Oceanography, 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

“Diversity and function from the ground up: Microbial mediation of wetland plant structure and ecosystem function via nitrogen fixation”

- Characterization of community diversity and activity of nitrogen-fixing microbes
- Evaluation of pathways for nitrogen transfer via plant-microbe interactions
- Functional assessments of disturbed and restored wetland ecosystems

Selected technical skills:

- Genetic fingerprinting (Terminal Restriction Fragment Length Polymorphism) of microbial communities via the *nifH* gene (encoding dinitrogenase reductase)¹⁵
- N_2 isotopic enrichment studies tracing paths of fixed nitrogen in wetlands
- Acetylene reduction assays and analyses with FID-equipped gas chromatograph

PUBLICATIONS

Moseman SM, Armaiz-Nolla K, and LA Levin (2008). Wetland response to sedimentation and nitrogen loading: diversification and functional decline of nitrogen fixing microbes. Ecological Applications, *in prep.*

Moseman SM, Johnson R., Zhang R, and PY Qian (2008) Succession and plants drive diversity- function relationships for nitrogen-fixing microbes in wetland ecosystems. Aquatic Microbial Ecology, *submitted.*

Moseman SM, Zhang R, Qian PY and LA Levin (2008) Diversity and functional responses of nitrogen fixing microbes to three wetland invasions. Invasions Biology DOI:10.1007/s10530-008-9227-0.

Moseman SM (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 SM, Levin LA, Currin CA, 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.S.G.S. Mendenhall Postdoctoral Fellowship (2008-2010)
 Cornell University Provost's Academic Diversity Postdoctoral Fellowship (deferred)
 U.C. President's Postdoctoral Fellowship (deferred)
 First Annual U.C. San Diego Outstanding Graduate Student Award (2008)
 Marine Biological Laboratory scholarship for Microbial Diversity course (2008)
 Vice Chancellor for Marine Sciences Diversity Award (2008)
 U.C. President's Dissertation Year Fellow (2007-2008, \$18,490)
 U.C. San Diego Environment and Sustainability Initiative
 First place for graduate student research in sustainability (2007)
 Society for the Advancement of Chicanos and Native Americans in Science
 Best graduate student oral presentation in Marine Biology (2006)
 National Oceanic and Atmospheric Administration, National Estuarine Research Reserve
 Graduate Research Fellow (2005-2007)
 3 year grant for wetland research (\$60,000)
 National Science Foundation Graduate Research Fellow (2003, 2004-06)
 Mildred Mathias Graduate Research Fellow (U.C. Natural Reserve System) (2005)
 Mia Tegner Memorial grant recipient (2004)
 Michael Mullin Fund research grant recipient (2003)
 Minority Access to Science Engineering and Mathematics Fellow (2002-2004)
 Sigma Xi Grant-in-Aid of Research recipient (2003)
 Eugene Cota-Robles Fellow (2002-2003)

TEACHING EXPERIENCE

Guest Lecturer, U.C. San Diego and Scripps Institution of Oceanography

- Biological Oceanography, U.C. San Diego upper division course in Ecology (2008)
 "Benthic Ecology of Soft Sediment Ecosystems"
- Scripps Institution of Oceanography graduate seminars:
 "The mighty role of microbes in wetland biogeochemistry" (2007, 2003)
 "Symbiotic nitrogen fixation" (2006)
 "Finding Nitrogen: the microbes that do this for wetland plants and all the rest of the earth" (2006)
- Summer Bridge Program (2003-2005) "Introduction to the southern California rocky intertidal zone"

Senior Teaching Assistant, Scripps Institution of Oceanography (2007-2008)

- Developed first departmental standards for graduate teaching assistants in marine science at U.C. San Diego
- Presented teaching resources via workshops and webpage development

Substitute Laboratory Instructor, U.C. San Diego (Feb 2008)

- Microbiology, upper division course

Instructor, California State Summer School for Mathematics and Science (2006)

COSMOS: The Living Oceans and Climate Change summer course

- Created course syllabus for "The Living Oceans"
- Designed and implemented field and laboratory exercises featuring:
 Coastal wetland field stations, larval settlement arrays on SIO pier,
 deep sea animal specimens, internet-based 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, Center for Teaching Development (2005- 2007)

- Developed and led workshops for teaching assistants and consultants including “Preparing Statements of Teaching Philosophy”
“Leading Science Discussion Sections”
- Reviewed and edited teaching assistant evaluations
- Observed, evaluated, and consulted with teaching assistants in science

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

- Designed “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, U.C. San Diego, Biology Department

- Biodiversity, upper division undergraduate course (2002)
- Evolutionary and Organismic Biology, lower division undergraduate course (2001- 2002)

MENTORING EXPERIENCE

Graduate Student Advocate, Summer Training Academy of Research in the Sciences (STARS), U.C. San Diego (June – Aug. 2007)

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

Lab Supervisor and Mentor for Kamil Armaiz- Nolla, University of Puerto Rico (2007)

- Student presented “Effects of sediment and nutrient additions on microbial diversity in a coastal wetland” at the U.C. San Diego Summer Research Conference and national American Society of Limnology and Oceanography conference
- Student co-authored manuscript in preparation for submission to Ecological Applications

Research Mentor for Rebecca Johnson, U.C. San Diego (2005- 2006)

- Intern won nomination to present research at U.C. San Diego Undergraduate Research Conference
- Student co-authored paper in review for Aquatic Microbial Ecology

RESEARCH EXPERIENCE

Mendenhall Postdoctoral Research Fellow, U.S.G.S. Woods Hole (June 2008- present)

Biogeochemistry and microbial ecology of N₂O cycling in benthic coastal ecosystems

- Flux chamber deployment and FID- and ECD-GC analyses of greenhouse gases

Microbial Diversity course participant, Marine Biological Laboratory (June-July 2008)

- Enrichment and isolation techniques in microbiology
- Clone library construction and microbial diversity analyses

Graduate Student, Scripps Institution of Oceanography (2002-2008)

Undergraduate Researcher, U.C. San Diego, laboratory of Dr. Lisa A. Levin (2001- 2002)

- Multidimensional scaling analyses with Primer, dissecting and compound microscopy for study of infaunal communities in salt marshes

International Collaborations

Netherlands Institute of Ecology, Center for Estuarine and Marine Ecology

- Isotopic enrichment study of microbial markers

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

- Benthic ecology of salt marshes in the Venice Lagoon
- Nitrogen fixation rate measurements in natural and restored marshes

Hong Kong University of Science and Technology (Jan. 2006)

- Genetic fingerprinting techniques with *nifH* gene

Research Cruise Participation

R/V Atlantis, Chief PI Ray Lee, Washington State University (2007)

- Studied macrofauna and microbes at deep sea hydrothermal vents of the Juan de Fuca Ridge using acetylene reduction and isotopic enrichment techniques

Johnson Sea Link (Harbor Branch Oceanographic), Chief PI Robert Carney, Louisiana State University (2003)

- Collected methane seep sediments and fauna from the Gulf of Mexico

RESEARCH PRESENTATIONS

American Society of Limnology and Oceanography (2008)

“Does microbial diversity maintain nitrogen fixation in a coastal wetland impacted by sedimentation and nutrient loading?”

Tijuana Estuary Visitor’s Center (2008)

“The role of nitrogen and sediment in the building or burying of the restored Friendship Marsh”

Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Meeting (2007)

“Failure of diversity to maintain nitrogen fixation in a coastal wetland facing sedimentation (and the Triple Border Fence)”

Loyola Marymount 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”

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.) (2007-2008)

- Revised and revitalized graduate student support network
- Planned professional, academic, and personal development workshops

Co-organizer of National SACNAS workshops

“Conversations with Ocean Scientists” (2008)

“Multidisciplinary Research Approaches in the Marine Sciences” (2007)

Graduate Student Representative, SIO Diversity Committee (2004-2008)

- Outreach and networking to encourage students of diverse backgrounds to pursue graduate studies
- Advising administration on recruitment and retention strategies for graduate students

Founding Member, Raza Graduate Student Association (2003-2008)

Aquarium Volunteer, Birch Aquarium at Scripps (1997- 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

REFERENCES

Dr. Lisa A. Levin

Graduate advisor, Biological Oceanography

Scripps Institution of Oceanography

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