

Dr. Scott M. Gifford

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Education and Training

2012-15 Postdoctoral Associate, Massachusetts Institute of Technology
2011 Ph.D. Marine Sciences, University of Georgia
2006 M.Sc., Marine Biology, San Francisco State University
2003 B.S., Evolution, Ecology, and Organismal Biology, The Ohio State University

Research Awards

2015 Romberg Tiburon Center Distinguished Alumnus Award
2010 UGA Marine Sciences Outstanding Research Award
2010 International Society of Microbial Ecology (ISME) Early Researcher poster award
2004 San Francisco Bay Scholarship

Research Experience

2012-2015 **Post Doctoral Research: DeLong Laboratory, MIT**
High-throughput dilution to extinction culturing to obtain novel isolates and consortia that degrade semi-labile DOC from the subtropical North Pacific gyre. Characterization of isolates growth on natural DOC to identify the genes providing the enzymatic mechanisms of DOC degradation.

2006-2011 **PhD dissertation research: Moran Laboratory, University of Georgia**
Sapelo Island Microbial Observatory (SIMO): Conducted a three year time series examining seasonal shifts in bacterioplankton taxonomic, functional gene, and transcript composition, and their influence on the fate of terrestrial and marine-derived organic matter in a Southeastern U.S. coastal ecosystem.

Metatranscriptomics of natural bacterioplankton communities: Employed massively parallel sequencing to examine diel and seasonal shifts in community expression, particularly as it relates to dissolved organic matter cycling.

Transcriptional response of *Silicibacter pomeroyi* to DMSP and related compounds: Performed whole-genome microarray analysis of a model marine organism's response to DMSP.

2007 **Microbial oceanography summer course: C-MORE, University of Hawaii**

2006 **Research Associate: Culver laboratory, The Ohio State University**

Conducted hydrographic monitoring, chemical analysis, and zooplankton composition studies of Ohio's fish hatcheries, as well as zebra mussel monitoring throughout Ohio.

- 2003-2005 **Masters thesis research: Bollens laboratory, San Francisco State University**
The role of nano- and microzooplankton in the lower food web of Suisun Bay: An examination of the protistan community composition and its potential as a source of prey for higher trophic levels in the northern reach of San Francisco Bay.
- 2002 **Research experience for undergraduates: Lind laboratory, Baylor University**
Examined the effects of light climate on phytoplankton respiration in Lake Waco.
- 2001-2002 **Undergraduate research assistant: Snow laboratory, The Ohio State University**
Assisted in studies of ecological impacts of gene transfer from transgenic to wild crops
- 2001 **Field technician: Hawaii Volcanoes National Park**
Monitored the reproductive and nesting behavior of endangered Hawksbill sea turtles.

Publications

- 2015 Sosa O.*, **Gifford SM***, Repeta D., and DeLong EF. Methylotrophs Dominate Dilution-to-Extinction Cultures Enriched with Marine Dissolved Organic Matter. **Authors contributed equally to this work.* ISME-J 9, 2725–2739
- 2015 Varaljay VA, Robidart J, Preston CM, **Gifford SM**, Ryan JP, Marin R, , *et al.* In Situ Observations of Bacterial Gene Regulation Controlling DMSP Fate. ISME-J
- 2014 Ottesen E, Curtis R, **Gifford SM**, Eppley JM, Marin R, Schuster SC, Scholin CA, DeLong EF. Multispecies diel transcriptional oscillations in open ocean heterotrophic bacterial assemblages. *Science* 345 (6193) 207-211.
- 2014 **Gifford SM**, Sharma S, and Moran MA. Linking Activity, Function, and Ecosystem Dynamics in Complex Bacterioplankton Communities. *Frontiers in Microbiology* (5) 185 doi: 10.3389/fmicb.2014.00185
- 2014 **Gifford SM**, Satinsky BM, and Moran MA. Quantitative Microbial Metatranscriptomics. In *Environmental Microbiology: Methods and Protocols, Second Edition*. Springer Science Publ. p213-229.
- 2013 Hollibaugh JT, **Gifford SM**, Moran MA, Ross M, Sharma S, Tolar B. Seasonal Variation in the Metatranscriptomes of a Thaumarchaeota Population from SE USA Coastal Waters. *The ISME Journal* doi: 10.1038/ismej.2013.171
- 2013 Satinsky BM, **Gifford SM**, Crump BC, and Moran MA. Use of Internal Standards for Quantitative Metatranscriptome and Metagenome Analysis. *Methods in Enzymology: Microbial Metagenomics, Metatranscriptomics, and Metaproteomics*. Elsevier publishers.
- 2013 Reisch CR, Crabb W, **Gifford SM**, Teng Q, Stoudemyer MJ, Moran MA, and Whitman WB. Metabolism of dimethylsulfoniopropionate by *Ruegeria pomeroyi* DSS-3. *Molecular Microbiology*. 89(4) 774-91

- 2012 **Gifford SM**, Sharma S, Booth M, and Moran MA. Expression Patterns Reveal Niche Diversification in a Marine Microbial Assemblage. *The ISME Journal*. 7(2):281-298
- 2012 Moran MA, Satinsky B, **Gifford SM**, Luo H, Rivers A, Chan LK, et al. Sizing up metatranscriptomics. *The ISME Journal*. 7(2) 237-43
- 2012 Varaljay VA, **Gifford SM**, Wilson ST, Sharma S, Karl DM, and Moran MA. Bacterial Dimethylsulfoniopropionate-degrading Genes in the Oligotrophic North Pacific Subtropical Gyre. *Applied and Environmental Microbiology*. 78(8): 2775-2782
- 2011 Rinto-Kanto JM, Bürgmann H, **Gifford SM**, Sun S, Sharma S, Kiene RP, and Moran MA. Analysis of sulfur-related gene expression by roseobacter communities using a taxon-specific functional gene microarray. *Environmental Microbiology* 13(2):453-467
- 2011 Rollwagen-Bollens G, **Gifford SM**, and Bollens SM. The role of protistan microzooplankton in the upper San Francisco Estuary planktonic food web: source or sink? *Estuaries and Coasts* 34:1026–1038
- 2011 Hollibaugh JT*, **Gifford SM***, Sharma S., Bano N, and Moran MA. Metatranscriptomic analysis of ammonia-oxidizing organisms in an estuarine bacterioplankton assemblage. *The ISME Journal* 5(5): 866–878 *Authors contributed equally to this work.
- 2011 **Gifford SM**, Shalabh S, Rinta-Kanto JM, and Moran MA. Quantitative analysis of a deeply-sequenced marine microbial metatranscriptome. *The ISME Journal* 5(3): 461–472
- 2010 Newton RJ, Griffin LE, Bowles K, Meile C, **Gifford SM**, Givens CE, et al. Genome characteristics of a generalist marine bacterial lineage. *The ISME Journal* 4: 784-798
- 2009 Poretsky RS, **Gifford SM**, Rinta-Kanto JM, Vila-Costa M, and Moran MA. Analyzing gene expression from marine microbial communities using environmental transcriptomics. *Journal of Visualized Experiments*. doi: 10.3791/1086
- 2009 Eloë E, Celussi M, Croal L, **Gifford SM**, Gomez-Consarnau L, Liu L, Paerl R, and Bottjer D. C-MORE/Agouron Institute young investigators perspective on the future of microbial oceanography. *Environmental Microbiology Reports* 1:3-26
- 2007 **Gifford SM**, Rollwagen-Bollens G, and Bollens SM. Microzooplankton omnivory in the upper San Francisco Estuary. *Marine Ecology Progress Series* 348: 33-46

Teaching and Service Activities

- 2013,14,15 **C-MORE microbial oceanography course instructor, University of Hawaii.** Gave lectures on how microbes structure marine ecosystems and biogeochemistry, as well as the molecular and bioinformatics tools used to identify those roles. Led bioinformatics labs in which the students annotated and analyzed a bacterial genome and metagenomes sequenced as part of the course.

- 2010 **Research mentor:** Provided instruction and guidance to three high school students who spent nine weeks characterizing *Silicibacter pomeroyi*'s response to DMSP and reactive oxygen species.
- 2008 **Lab instructor:** *Biology and Ecology of the Marine Environment* MARS1020L, UGA
Instructed three sections with 20 students each
- 2007-2011 **Treasurer,** Marine Science Graduate Student Association

Research Cruise Experience

- R/V *Sierra Negra*, 15 days around the Galapagos Islands, Ecuador
R/V *Endeavor*, 7 days in the eastern North Atlantic
R/V *Kai Kai*, 5 days off the coast of Chile
R/V *Melville*, 14 days in the Amazon River Plume and Western Atlantic
R/V *Kilo Moana*, 10 days in the Subtropical North Pacific
R/V *Questuary*, 12 day cruises in Northern San Francisco Bay
R/V *Polaris*, 1 day from South to North San Francisco Bay
R/V *Point Sur*, 1 day off the coast of Monterey Bay

Professional Memberships

- 2008-present International Society for Microbial Ecology
2007-present American Society for Microbiology
2003-present American Society for Limnology and Oceanography