

Gregory Daniel O'Mullan

Associate Professor

School of Earth and Environmental Sciences

Queens College, City University of New York

65-30 Kissena Blvd, Flushing, NY 11367

718-997-3452; gomullan@qc.cuny.edu

Doctoral Faculty, Earth and Environmental Sciences

Graduate Center, City University of New York

Adjunct Associate Research Scientist

Lamont-Doherty Earth Observatory of Columbia University

Education:

Ph. D. Princeton University, Department of Ecology and Evolutionary Biology, 2005

Advisor: B. B. Ward; Thesis: "Diversity and composition of ammonia oxidizing bacterial assemblages in aquatic environments and their impact on biogeochemical function"

M. A. Princeton University, Department of Ecology and Evolutionary Biology, 2002

M. S. University of Medicine and Dentistry of NJ / Rutgers, Cell and Developmental Biology, 2000

Advisor: R. C. Vrijenhoek; Thesis: "Speciation gene flow and hybridization in mussels (Bivalvia: Mytilidae) from mid-Atlantic hydrothermal vents"

B. S. Cook College, Rutgers University, Environmental Science/Marine Science, 1998

Additional Education/Certificates for Course Completion:

Marine Biological Laboratory at Woods Hole, Microbial Diversity Course, Summer 2004

Marine Biological Laboratory at Woods Hole, Molecular Evolution Course, Summer 2003

Prior Professional Positions:

Assistant Professor, School of Earth and Environmental Sciences, Queens College, City University of New York, September 2008 – August 2015

Postdoctoral Research Scientist, **Lamont-Doherty Earth Observatory of Columbia University**, Earth Microbiology Initiative, June 2006 – August 2008

Postdoctoral Research Associate, **Princeton University**, Department of Geosciences, December 2005 – May 2006

Research Assistant II, **University of Connecticut**, Department of Molecular and Cell Biology, January 2000 – September 2000

Courses Taught as Primary Instructor (F2008-Sp2015 only; prior experience not listed):

EnSci 100- Introduction to Environmental Science (F10, S11, F11, F12, S13, S14, F14, Sp15)

EnSci 203/Geo 799- Environmental Microbiology (F11, F13, Sp15)

Geo 009- Environmental Issues and Answers (F08, F09, F10)

Geo 383- Special Topics- Aquatic Microbiology (Su15)

Geo 766- Analytical Approaches in Environmental Geoscience (F09)

Geo 788- Cooperative Placement (MS Internship) (S10, S11, S12, S13, S14, S15)

O'Mullan CV

Geo 799- Special Topics: Aquatic Geomicrobiology (S09)

Geo 793- Independent Study Courses- Molecular Evolution for Geosciences (S13); Bioremediation (F10); Microbial Ecology, (S10); Molecular Techniques in Geobiology, (S09).

Research Student and Postdoctoral Mentoring:

M.A. thesis students- Suzanne Young (QC'11)(currently a PhD student at University of Southern Florida), Simon Lax (QC'12) (currently a PhD student at University of Chicago)

Ph.D. thesis students- Brian Brigham (CUNY, co-advised with J. Bird)

M.S. research students- E. Schneider (QC'12), K. Clauson (QC'12), Michael Kausch (QC'14), Elizabeth Farrell (2015-present).

Mentor for Postdoctoral Research Scientist- M. Elias Dueker, (2012/13)

Committee member for- Sixto Portilla (GC-CUNY, PhD'16), F. Santos (GC-CUNY, PhD'14), E. Rice (GC-CUNY, PhD'13), M. E. Dueker (research co-advisor and committee member, Columbia MA '08, PhD '12), M. Yilmaz (QC, MA '10), V. Acosta (QC, MA '11), Y. Choi (QC, MA '12).

Mentor for visiting fellow- Maren Mellendorf, Austrian Marshall-Plan Fellow, Feb-Aug 2010; Yoshi Matsumoto Toyota National College of Technology, Japan, June-October 2014.

Mentor for undergraduate researchers- Sarah McGrath (Columbia, BA thesis '07, *EEEE departmental thesis award winner*), Simon Lax (Columbia, BA thesis '08), Amanda Rook (Barnard, BA thesis '08), Elizabeth Suter (LDEO intern '08-09), Annakarina Marinos (QC student researcher, CSURP summer 2010), Alison Gold (QC student researcher, 2011, 2013), Bibi Hossein, QC student intern, 2013), Roman Reichert (QC student researcher 2012-present), Angel Montero (QC student researcher, 2010-present), Isabel Becerra (2015-present), Daniel Rivera (2015-present), Anju Amahadeo (2015-present).

Mentor for high school researchers- Anna Doran (2012- winner of Westchester Science and Engineering Fair's Stockholm Junior Water Prize and the Momentive Performance Materials Award), Jeffrey Perez (2013, 2014), Amanda Morel (2013, 2014, winner of Westchester Science and Engineering Fair's Stockholm Junior Water Prize and NYS representative at the National Stockholm Junior Water Prize Competition).

Service Activities Include:

- **Deputy Chair School of Earth and Environmental Sciences** (summer 2014- present)

- **Graduate Program Advisor for the School of Earth and Environmental Sciences** (2009 - present)
Student advisement (typically 20-30 students in MA/MS programs), overseeing graduate admissions, and directing MA in Geological and Environmental Sciences and MS in Applied Environmental Geosciences.

- **Personnel and Budget Committee, School of Earth and Environmental Sciences** (2012- present).

- **Environmental Studies Undergraduate Major Advisor Committee, Queens College** (2013 - present)

- **Reviewing activities include:** FEMS Microbiology Letters, Applied & Environmental Microbiology, Continental Shelf Research, Environmental Science & Technology, Environmental Science & Pollution Research, Journal of Water & Health, Marine Environmental Research, etc.

O'Mullan CV

Broader Impacts/Synergistic Activities Include:

- Participant and supporting laboratory for New York City Water Trail Association Citizen's Water Quality Testing Program (2013-present); New York State Senate Environmental Committee testimony on Hudson Water Quality and Sewage Right to Know Legislation (October 2011); Science Advisor for Riverkeeper (2006-present); Contributor to Riverkeeper's annual Hudson River water quality report and Hudson River water quality web site for public (>10,000 web hits each year) (2008-present).
-

Recent Awards:

- 2014 Recipient of CUNY Junior Faculty Research Award in Science and Engineering (JFRASE)
- Invited Speaker at Congresswoman Nita Lowey's Press Conference on Clean Water Infrastructure Investment, July 2013

PI or Co-PI on external grants & awards from the following agencies/foundations:

- United States Environmental Protection Agency
- National Science Foundation
- Hudson River Foundation
- Riverkeeper
- The Sloan Foundation/CUNY- JFRASE
- Eppley Foundation
- Wallace Foundation
- Brinson Foundation

Publications:

- O'Mullan, G.D., M.E. Dueker, K. Clauson, Q. Yang, K. Umemoto, N. Zakharova, J. Matter, M. Stute, T. Takahashi, and D. Goldberg. 2015. Microbial succession and stimulation following a test well injection simulating CO₂ leakage into a shallow Newark Basin aquifer. PLoS ONE 10(1): e0117812. doi:10.1371/journal.pone.0117812
- Yang, Q., J. Matter, T. Takahashi, M. Stute, G.D. O'Mullan, K. Clauson, K. Umemoto, D. Goldberg. 2015. Groundwater geochemistry in bench experiments simulating CO₂ leakage from geological storage in the Newark Basin. International Journal of Greenhouse Gas Control 42:98-108.
- Afshinnekoo, E., C. Meydan, S. Chowdhury, D. Jaroudi, C. Boyer, N. Bernstein, J. M. Maritz, D. Reeves, J. Gandara, S. Chhangawala, S. Ahsanuddin, A. Simmons, T. Nessel, B. Sundaresh, E. Pereira, E. Jorgensen, Sergios-Orestis Kolokotronis, Nell Kirchberger, Isaac Garcia, David Gandara, Sean Dhanraj, T. Nawrin, Y. Saletore, N. Alexander, P. Vijay, E. M. Hénaff, P. Zumbo, M. Walsh, G. D. O'Mullan, S. Tighe, J. T. Dudley, A. Dunaif, S. Ennis, E. O'Halloran, T. R. Magalhaes, B. Boone, A. L. Jones, T. R. Muth, K. S. Paolantonio, E. Alter, E. E. Schadt, J. Garbarino, R. J. Prill, J. M. Carlton, S. Levy, C. E. Mason. 2015. Geospatial Resolution of Human and Bacterial Diversity with City-Scale Metagenomics, Cell Systems, ISSN 2405-4712, <http://dx.doi.org/10.1016/j.cels.2015.01.001>.
- Yang, Q., J. Matter, M. Stute, K. Umemoto, K. Clauson, M.E. Dueker, G.D. O'Mullan, T. Takahashi, N. Zakharova, D. Goldberg. 2014. Groundwater hydrogeochemistry in injection experiments simulating CO₂ leakage from a geological storage reservoir. International Journal of Greenhouse Gas Control. 26:193-203.
- Dueker, M.E. and G.D. O'Mullan. 2014. Aeration remediation of a polluted waterway increases near-surface coarse and culturable microbial aerosols. Science of the Total Environment. 478:184-189.

O'Mullan CV

- Young, S., A. Juhl, and G. O'Mullan. 2013. Antibiotic resistant bacteria in the Hudson River Estuary linked to wet weather sewage contamination. *Journal of Water and Health*. 11(2):297-310.
- Eaton, T., G. O'Mullan, A. A. Rouff. 2013. Assessing contamination from continuous combined sewer outfall (CSO) discharge on a tidal creek; bacteriological and heavy metal indicators. *Annals of Environmental Science*. 7:79-92
- Francis, C.A., G.D. O'Mullan, J.C. Cornwell, B.B. Ward. 2013. Transitions in nirS-type denitrifier diversity, community composition, and biogeochemical activity along the Chesapeake Bay Estuary. *Frontiers in Aquatic Microbiology*. 4(237):1-12.
- Dueker, M.E., G. O'Mullan, A. Juhl, K. Weathers, and M. Uriarte. 2012. Local environmental pollution strongly influences culturable bacterial aerosols at an urban aquatic superfund site. *Environmental Science and Technology* 46(20):10926-10933.
- Dueker, M.E., G. O'Mullan, K. Weathers, A. Juhl, and M. Uriarte. 2012. Coupling of fog and marine microbial content in the near shore coastal environment. *Biogeosciences* 9: 803-813
- Suter, E., A. Juhl, G. O'Mullan. 2011. Particle association of *Enterococcus* and total bacteria in the lower Hudson River Estuary, USA. *Journal of water resource and protection* 3(10):715-725.
- Dueker, M.E., K. Weathers, G. O'Mullan, A. Juhl, and M. Uriarte. 2011. Environmental controls on coastal coarse aerosols: implications for microbial aerosol content and deposition at the waterfront. *Environmental Science and Technology* 45(8):3386-3392.
- Bouskill, N., D. Eveillard, G. O'Mullan, J. Jackson, and B. B. Ward. 2011. Seasonal and annual reoccurrence patterns in ammonia-oxidizing bacterial population structure. *Environmental Microbiology* 13(4):872-886.
- Jayakumar, A., G.D. O'Mullan, S.W.A. Naqvi, and B.B. Ward. 2009. Denitrifying bacterial community composition associated with the stages of denitrification in oxygen minimum zones. *Microbial Ecology* 58(2):350-362.
- Foster, R. and G. D. O'Mullan. 2008. Chapter 27-Nitrogen fixing and nitrifying symbioses in the marine environment. Pages 1197-1218. In: *Nitrogen in the Marine Environment*, 2nd edition. Edited by D. G. Capone, D. A. Bronk, M. R. Mulholland, and E. J. Carpenter. (2008)
- O'Mullan, G.D., and B.B. Ward. 2005. Comparison of temporal and spatial variation of ammonia oxidizing bacteria and nitrification rates in Monterey Bay, CA. *Applied and Environmental Microbiology* 71(2): 697-705.
- Ward B. B. and G. D. O'Mullan. 2005. Community-level analysis: aerobic ammonia oxidation activity measurements and gene analysis. *Methods in Enzymology* 397: 395-413.
- Giller, P., H. Hillebrand, U.K. Berninger, M.O. Gessner, S. Hawkins, P. Inchausti, C. Inglis, H. Leslie, B. Malmqvist, M. Monaghan, P J. Morin, and G.D. O'Mullan. 2004. Biodiversity effects on ecosystem functioning: emerging issues and their experimental test in aquatic environments. *Oikos* 104: 423-436.
- Francis, C., G.D. O'Mullan, and B.B. Ward. 2003. Diversity of ammonia monooxygenase (amoA) genes across environmental gradients in Chesapeake Bay sediments. *Geobiology* 1(2): 129-140.
- Won, Y.J., S.J. Hallam, G.D. O'Mullan, and R.C. Vrijenhoek. 2003. Cytonuclear disequilibrium in a hybrid zone involving deep-sea hydrothermal vent mussels of the genus *Bathymodiulus*. *Molecular Ecology* 12: 3185-3190
- Won, Y.J., S.J. Hallam, G.D. O'Mullan, I. Pan, K. Buck, and R.C. Vrijenhoek. 2003. Environmental acquisition of thiotrophic endosymbionts by deep-sea mussels of the genus *Bathymodiulus*. *Applied and Environmental Microbiology* 69(11): 6785-6792.

O'Mullan CV

Ward B. B. and G. D. O'Mullan. 2002. Worldwide distribution of *Nitrosococcus oceani*, a marine ammonia-oxidizing γ -Proteobacteria, detected in seawater by PCR and sequencing of 16S rRNA and *amoA* genes. *Applied and Environmental Microbiology* 68 (8): 4153-4157.

O'Mullan, G. D., P. A. Y. Maas, R. A. Lutz, and R. C. Vrijenhoek. 2001. A hybrid zone between hydrothermal vent mussels (Bivalvia: Mytilidae) from the Mid-Atlantic Ridge. *Molecular Ecology* 10 (12): 2819-2832. (Cover)

Maas, P. A. Y. , G. D. O'Mullan, R. A. Lutz, and R. C. Vrijenhoek. 1999. Genetic and morphometric characterization of mussels (Bivalvia: Mytilidae) from mid-Atlantic hydrothermal vents. *Biological Bulletin* 196: 265-272.

Data Reports, Management Papers, & Newspaper Op-Eds:

Shapley, D. (lead author of report); study conducted by J. Liscomb, A. Juhl, and G. O'Mullan; (report editors: Lipscomb, Shapley, Epstein, O'Mullan, Juhl, and Knudson.). "How's the water: 2015. Fecal Contamination in the Hudson River and Its Tributaries (vol 4)". http://www.riverkeeper.org/wp-content/uploads/2015/06/Riverkeeper_WQReport_2015_Final.pdf

Shapley, D. and Brown, T. (lead authors of report); study conducted by J. Liscomb, A. Juhl, and G. O'Mullan; (report editors: Lipscomb, Epstein, Shapley, Juhl, and O'Mullan.). "How's the water: 2014 (vol 3). Sewage Contamination in the Hudson River Estuary". http://www.riverkeeper.org/wp-content/uploads/2014/07/Riverkeeper_Water_Quality_Hows-the-Water-Report_2014-lr.pdf

Montero, A., B. Brigham, and G. O'Mullan. 2014. Nutrient pollution in Hudson River marshes: effects on greenhouse gas production. Section III: 1-24 pp. In S. H. Fernald, D. Yozzo, and H. Andreyko (eds.), Final Report of the Tibor T. Polgar Fellowship Program, 2013.

Schneider, E. and G. O'Mullan. 2013. Investigation of estuarine sediment as a reservoir for sewage associated bacteria. Section II: 1-22 pp. In S. H. Fernald, D. Yozzo, and H. Andreyko (eds.), Final Report of the Tibor T. Polgar Fellowship Program, 2012.

Brown, T. (lead author); study conducted by J. Liscomb, A. Juhl, and G. O'Mullan. 2012. (report editors: Lipscomb, Juhl, O'Mullan, and Wolff). How is the water? Volume 2, Sewage Contamination in the Hudson River Estuary 2006-2011. http://www.riverkeeper.org/wp-content/uploads/2012/12/RvK_How-Is-the-Water-2012.pdf

Young, S. and G. O'Mullan. 2011. Quantification and identification of antibiotic resistant microbes in the Hudson River and Flushing Bay. Section II: 1-27 pp. In S. H. Fernald, D. Yozzo, and H. Andreyko (eds.), Final Report of the Tibor T. Polgar Fellowship Program, 2010. Hudson River Foundation. www.hudsonriver.org/ls/reports/Polgar_Young_TP_08_10_final.pdf

O'Mullan, G. 2011. Testimony submitted to New York State Senate Environmental Committee. www.riverkeeper.org/wp-content/uploads/2011/10/OMullan-testimony-10-14-11.pdf

Brown, T. (lead author); study conducted by J. Liscomb, A. Juhl, and G. O'Mullan. 2011. (report editors: Brown, Cearly, Juhl, Lipscomb, O'Mullan). How is the water? Sewage Contamination in the Hudson River Estuary 2006-2010. http://www.riverkeeper.org/wp-content/uploads/2011/08/RvK_How-Is-the-Water_2006-10.pdf

Lipscomb, J., G.D. O'Mullan, A. Juhl. 2010. "Rockland County Environmental Committee report on Hudson River Water Quality". Delivered to County Legislature Environmental Committee 8/25/2010.

Dueker, M. E. and G. D. O'Mullan. 2009. Capturing the nutrient overenrichment-eutrophication-hypoxia cycle at Newtown Creek. Section II: 17 pp. In S. H. Fernald, D. Yozzo, and H. Andreyko (eds.), Final Report of the Tibor T. Polgar Fellowship Program, 2008. Hudson River Foundation. http://www.hudsonriver.org/ls/reports/Polgar_Dueker_TP_03_08_final.pdf

O'Mullan CV

Michaels, C., J. Lipscomb, G.D. O'Mullan, A. Juhl, R. Sambrotto. 2008. "Swimmable River: towards better water quality monitoring in the Hudson River Estuary". (provided data for report and assisted in writing/editing) www.riverkeeper.org/campaign.php/hudson_water_quality

Chillrud, S., G.D. O'Mullan, W. McGillis. 2008. "Sensory Deprivation" Op-Ed, New York Times, 1/30/2008.

McGrath, S. and G. O'Mullan. 2007. Significance of estuarine hypoxia to altered nutrient cycling and toxic nitrite accumulation. Final Report of the 2007 Tibor T. Polgar Fellowship Program, Hudson River Foundation.

O'Mullan, G. D., W. McGillis, R. Sambrotto, P. Orton, B. Mailloux. 2007. Sniffing Out the Truth. Op-Ed, New York Times, Sunday 1/21/2007; sec 4, p 13.

Organizational meeting and white paper participant. 2007. "Hudson River Environmental Conditions Observing System (HRECOS): An observational network on the Hudson River Estuary" www.ecostudies.org/hrecos/HRECOS.pdf

O'Mullan, G. D. and A. Antoniou. 2002. Molecular identification of tissues from the whale shark, *Rhincodon typus*. Report to the Twelfth meeting of the Conference of Parties, in support of proposal 12.35 to add *Rhincodon typus* to Appendix II of CITES. CoP12 Inf. 31, p.7-8. www.cites.org/common/cop/12/ESF12i-31.PDF

Halanych, K. M., M. Tieger, G. D. O'Mullan, R. A. Lutz, and R. C. Vrijenhoek. 1999. Brief description of biological communities at 7°S eastern Pacific Rise. *Interridge News* 8(2): 23-27.

Mentor for external research fellowships awarded to student advisees or co-advisees:

Brian Brigham- Hudson River Foundation Mark B. Bain Graduate Fellowship, 2015-2016

Angel Montero- Hudson River Foundation Polgar Fellow, 2013

Erin Schneider- Hudson River Foundation Polgar Fellowship, 2012

Brian Brigham- NOAA-NERR Graduate Fellowship, 2010-2013

Suzanne Young- Hudson River Foundation Polgar Fellowship, 2010

Maren Mellendorf- Marshall-Plan Fellowship, visiting PhD student from Austria, 2010

M. Elias Dueker- Hudson River Foundation Graduate Fellowship, 2010-2011

M. Elias Dueker- Hudson River Foundation Polgar Fellowship, 2009

Sarah McGrath- Hudson River Foundation Polgar Fellowship, 2007

Media coverage of research includes (2007-2015):

- Newspaper/Print, over 40 articles covering research projects since 2007 including: New York Times, Albany Times Union, Huffington Post, Queens Chronicle, Chemical and Engineering News, DNA info, Poughkeepsie Journal, Tarrytown Patch, The Palisades Newsletter, Outside Magazine.
- TV and Radio: CBS nightly news, PBS- Earth Day Special "Fragile Waters", CUNY-TV Science and U, News Channel 12, 880 WCBS, WAMC northeast public radio- Earth Wise.