

JULIAN DAMASHEK, PHD

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Utica College

Assistant Professor of Biology (starting Fall 2019)

EDUCATION

University of Georgia

Postdoctoral research associate, September 2016 to present
Advisors: Tim Hollibaugh, Liz Ottesen (Feb. 2019 to present)

Stanford University

Ph.D. in Earth System Science, September 2016
Advisor: Christopher Francis

Amherst College

B.A. (*Summa Cum Laude* with distinction) in Biology, May 2009
Thesis advisor: Rachel Levin

RESEARCH OVERVIEW: MOTIVATING QUESTIONS

- What is the ecology and physiology of archaea in aquatic ecosystems?
- How do aquatic microbes compete for nitrogen?
- How do microbial diversity and activity affect aquatic nitrogen cycling rates?

My group uses techniques from microbial ecology, 'omics, cultivation-based microbiology, and isotope geochemistry to explore these questions.

PUBLICATIONS

([†]indicates undergraduate mentee)

- 8) **Damashek J.**, B.B. Tolar, Q. Liu, A.O. Okotie-Oyekan[†], N.J. Wallsgrove, B.N. Popp, and J.T. Hollibaugh. (2018) Microbial oxidation of nitrogen supplied as selected organic nitrogen compounds in the South Atlantic Bight. *Limnology and Oceanography*. doi.org/10.1002/lno.11089
- 7) **Damashek J.** and C.A. Francis. (2018) Microbial nitrogen cycling in estuaries: from genes to ecosystem processes. *Estuaries and Coasts* 41(3): 626-660. doi.org/10.1007/s12237-017-0306-2
- 6) **Damashek J.**, K.P. Pettie[†], Z.W. Brown, M.M. Mills, K.R. Arrigo, and C.A. Francis. (2017) Regional patterns in ammonia-oxidizing communities throughout Chukchi Sea waters from the Bering Strait to the Beaufort Sea. *Aquatic Microbial Ecology* 79(3): 273-286. doi.org/10.3354/ame01834
- 5) **Damashek J.**, K.L. Casciotti, and C.A. Francis. (2016) Variable nitrification rates across environmental gradients in turbid, nutrient-rich estuary waters of San Francisco Bay. *Estuaries and Coasts* 39(4): 1050-1071. doi.org/10.1007/s12237-016-0071-7
- 4) Smith J.M., **J. Damashek**, F.P. Chavez, and C.A. Francis. (2016) Factors influencing nitrification rates and the abundance and transcriptional activity of ammonia oxidizing microorganisms in the

dark realm of the northeast Pacific Ocean. *Limnology and Oceanography* 61(2): 596-609. doi.org/10.1002/lno.10235

- 3) Ying S.C., J. **Damashek**, S. Fendorf, and C.A. Francis. (2015) Indigenous arsenic(V)-reducing microbial communities in redox-fluctuating near-surface sediments of the Mekong Delta. *Geobiology* 13(6): 581-587. doi.org/10.1111/gbi.12152
- 2) **Damashek J.**, J.M. Smith, A.C. Mosier, and C.A. Francis. (2015) Benthic ammonia oxidizers differ in community structure and biogeochemical potential across a riverine delta. *Frontiers in Microbiology* 5: 743. doi.org/10.3389/fmicb.2014.00743
- 1) Miller J.S., A. Kamath, J. **Damashek**, and R.A. Levin. (2011) Out of America to Africa or Asia: Inference of dispersal histories using nuclear and plastid DNA and the *S-RNase* self-incompatibility locus. *Molecular Biology and Evolution* 28(1): 793-801. doi.org/10.1093/molbev/msq253

GRANTS, FELLOWSHIPS, AND AWARDS

Early Career Travel Grant

ASLO Aquatic Sciences Meeting (2019; \$500)

Early Career Travel Award

CERF Biennial Conference (2017; \$300)

Stanford-USGS Graduate Fellowship

Stanford University (2014-2015 academic year; tuition, stipend, professional expenses)

Outstanding Student Oral Presentation Award

ASLO Aquatic Sciences Meeting (2015)

McGee Research Grant

Stanford University (2014, \$2,200; 2011, \$3,800)

John Mason Clarke 1877 Fellowship in Paleontology and Geology

Amherst College (2011-2012 academic year, \$3,300; 2010-2011 academic year, \$5,200)

Oscar E. Schotte Award

Amherst College Department of Biology (2009)

Oscar E. Schotte Scholarship Prize

Amherst College Department of Biology (2009)

Oral Presentation Award

Northeast Undergraduate Research and Development Symposium (2009)

Funded Summer Research Internship

Five College Coastal and Marine Sciences Program (Summer 2007)

William C. Young Prize

Amherst College Department of Biology (Summer 2007)

Howard Hughes Medical Institute Summer Fellow

Amherst College (Summer 2006)

RESEARCH EXPERIENCE

Postdoctoral Research

Hollibaugh Lab, University of Georgia Department of Marine Sciences (Fall 2016 to present)

Cycling of organic nitrogen by marine *Thaumarchaeota* in culture and in the coastal ocean.

Metagenomic and metatranscriptomic analyses of marine and freshwater archaea. Targeted study of ammonium-cycling genes/transcripts in 'omics datasets. Cultivation and basic physiology and genomics of two novel strains of marine ammonia-oxidizing archaea (*Thaumarchaeota*) and one novel marine nitrite-oxidizing bacterium.

Doctoral Research

Francis Lab, Stanford University Department of Earth System Science (Summer 2010 to Summer 2016)

Microbial ecology and biogeochemistry of nitrification (microbial oxidation of ammonia to nitrite and nitrate) in estuaries.

Research Assistant

Martini Lab, Amherst College Department of Geology (Summer 2009 to Summer 2010)

Microbial ecology (16S rRNA gene diversity) of gas wells in the New Albany Shale.

Undergraduate Honors Thesis

Miller/Levin Lab, Amherst College Department of Biology (Summer 2008 to Spring 2009)

Molecular evolution and phylogenetics of Chinese *Lycium* plants by sequencing multiple nuclear and chloroplast genes.

Research Assistant

Atema Lab, Woods Hole Marine Biological Laboratory (Summer 2007)

Function of the lateral line in smooth dogfish sharks (REU intern at the MBL).

Research Assistant

Clotfelter Lab, Amherst College Department of Biology (Summer 2006 to Spring 2008)

As a Howard Hughes Medical Institute Fellow (Summer 2006), developed non-invasive method to sample fish hormones and studied effects of endocrine-disrupting chemicals on fish reproductive health; continued part-time work throughout the 2006-2007 and 2007-2008 academic years.

GUEST TEACHING

Field Study in Oceanography and Marine Methods

University of Georgia Marine Institute (Summer 2018)

Modified a module on coastal biogeochemistry in which students measured nitrogen-cycling rates in oyster beds; lectured on coastal nitrogen cycling processes and associated microorganisms.

Marine Biology

University of Georgia Department of Marine Sciences (Fall 2017)

Taught two units: (1) estuaries and salt marshes; (2) marine biodiversity.

Geomicrobiology

Stanford University Department of Earth System Science (Winter 2015)

Taught unit on sulfur-cycling microbes (metabolism, physiology, and ecology).

Multi-Disciplinary Perspectives on a Large Urban Estuary: San Francisco Bay

Stanford University Department of Earth System Science (Spring 2012, 2014)

Taught two units: (1) invasive species in estuaries; (2) ammonia pollution in the Sacramento/San Joaquin River Delta, including relevant scientific research and the policy implications of wastewater treatment plant upgrades and water diversions.

TEACHING ASSISTANT

*(*indicates significant contribution to course design)*

Hopkins Microbiology Course*

Stanford University Hopkins Marine Station (Summer 2012, 2015)

Assisted in setup and organization of research and computer labs; designed and developed laboratory and field experiments; lectured on experimental backgrounds and methods; coordinated laboratory and field activities; developed data analysis tutorials.

Multi-Disciplinary Perspectives on a Large Urban Estuary: San Francisco Bay*

Stanford University Department of Earth System Science (Spring 2012, 2014)

Assisted in design of syllabus and assignments; led student discussions of primary literature; organized field trips; graded assignments.

Measurements in Earth Systems*

Stanford University Department of Earth System Science (Winter 2012, 2013)

Developed curriculum for aquatic field methods portion (including field and laboratory work); chartered research vessel for field work; developed field and laboratory protocols; revised syllabus and experiments for second year.

Exploring the Critical Interface Between the Land and Monterey Bay: Elkhorn Slough

Stanford University Department of Earth System Science (Spring 2011, 2013)

Led student discussions of primary literature; facilitated field trips; graded assignments.

Geomicrobiology

Stanford University Department of Earth System Science (Winter 2013)

Facilitated student-led discussions of primary literature; assisted with writing and grading of final exam.

UNDERGRADUATE MENTORSHIP

Hailey Goldberg *University of Georgia '20 (Summer 2018)*

Analysis of *Thaumarchaeota* in freshwater metagenomes.

Aimee Okotie-Oyekan *University of Georgia '17 (Fall 2016 to Summer 2018)*

Grazing rates of *Thaumarchaeota* and abundance of Marine Group II *Euryarchaeota* in coastal Georgia waters. Co-author on a manuscript in revision at *Limnology and Oceanography*.

- Currently: M.S. student, University of Oregon Environmental Studies Program.

Tynan Challenor *Stanford University '17 (Summer 2014 to Summer 2016)*

Biogeochemistry and microbial ecology of nitrification in Artesian Slough and the Sacramento River.

First-author poster presentation, 2014 AGU Fall Meeting; co-author on additional presentations; completed honors thesis (2017) studying ammonia oxidizers in the Sacramento River.

- Currently: M.S. student, Stanford University Biomedical Informatics Program.

Aubriana Menendez *Stanford University '17 (Summer 2014)*

Microbial ecology of Artesian Slough (San José, CA). Co-author on poster presentation, 2014 AGU Fall Meeting.

- Currently: design specialist at Change Healthcare.

Kade Pettie *Amherst College '15 (Summer 2013, 2014)*

Microbial ecology of ammonia oxidizers in Arctic Sea waters. Co-author on manuscript published in *Aquatic Microbial Ecology* (2017).

- Currently: Ph.D. student, Stanford University Department of Biology.

Kofi Christie *Morehouse College '14 (Summer 2013)*

Biogeochemistry of nitrogen cycling in creeks and sloughs throughout the Baylands Nature Preserve (Palo Alto, CA).

- Currently: Ph.D. student, Vanderbilt University Department of Environmental Engineering.

Yari Greaney *Stanford University '15 (Fall 2012 to Spring 2013)*

Microbial ecology of ammonia oxidizers in San Francisco Bay sediments.

- Currently: program officer at Global Water 2020.

Samuel Miller *Amherst College '10 (Summer 2009 to Spring 2010)*

Bacterial diversity of natural gas well water in the New Albany Shale. First-author poster presentation, 2010 GSA Northeastern/Southeastern Joint Section Meeting; co-author on oral presentation, 2010 Goldschmidt Conference.

- Currently: Ph.D. student, University of Chicago Department of Geophysical Sciences.

GRADUATE MENTORSHIP

Emily McIntyre *University of Georgia, Microbiology PhD program (Fall 2016)*

Microbial ecology of ammonia oxidizers in Narragansett Bay (rotation in the Hollibaugh Lab).

- Currently: Ph.D. student, University of Georgia Department of Microbiology.

PROFESSIONAL AND INSTITUTIONAL SERVICE

Social Media Team Lead (Communications Committee)

Coastal and Estuarine Research Federation (CERF; Fall 2017 to present)

Coordinate social media outreach, develop strategies and standard operating procedures for social media team and interactions with CERF headquarters and other committees.

Conference Attendee Experience Committee Member

2019, 2017 Coastal & Estuarine Research Federation (CERF) Biennial Conference (November 2019 and 2017)

Co-leader of social media committee.

Conference Session Organizer

2017 Coastal & Estuarine Research Federation (CERF) Biennial Conference (November 2017)

Organized session: "Microbial Communities and the Dynamics and Resilience of Ecosystem Function" (<https://cerf.confex.com/cerf/2017/webprogrampreliminary/Session1364.html>).

2016 Ocean Sciences Meeting (February 2016)

Organized session: "Nitrogen at the Interface: The N-Cycle across Physical and Disciplinary Boundaries" (<http://agu.confex.com/agu/os16/preliminaryview.cgi/Session9274>).

2014 American Geophysical Union (AGU) Fall Meeting (December 2014)

Solicited and organized judges for student presentations (poster and oral) for the "Marine Microbial Genomics" session (<https://agu.confex.com/agu/fm14/webprogrampreliminary/Session3363.html>).

Graduate Student Consultant

Stanford University Center for Teaching and Learning (Autumn 2013 to Winter 2015)

Provided teaching feedback to Stanford TAs. Ran small group evaluations, workshops, video consultations, and microteaching sessions. Developed a workshop on strategies for the first day of teaching, a short description of which can be seen in this blog post: <http://stanford.io/1Fwj9z> (scroll to "The First Day: Starting Off Right").

Geobiology Faculty Search Committee (Student Liaison)

Stanford University School of Earth, Energy, and Environmental Sciences (Autumn 2011 to Spring 2012)

Assisted with organization of seminar series and student-candidate lunches and dinners. Met with candidates during interviews, solicited and presented student feedback on candidates to faculty search committee members.

Peer Reviewer

Funding agencies: NSF OCE (Chemical Oceanography, ad hoc), Maryland Sea Grant (ad hoc).

Journals: *Applied & Environmental Microbiology*, *Aquatic Microbial Ecology*, *Aquatic Sciences*, *Biogeosciences*, *Environmental Microbiology*, *Estuaries and Coasts*, *Frontiers in Marine Science*, *Frontiers in Microbiology*, *ISME Journal*, *Journal of Geophysical Research: Biogeosciences*, *Limnology & Oceanography*, *Microbial Ecology*, *Microbiome*, *Science of the Total Environment*, *Water Resources Research*.

INVITED SEMINARS

"Understanding nitrogen uptake in the ocean using metatranscriptomics, or: How I learned to stop worrying and love the command line." *Amherst College Department of Biology*, 3/5/18.

"Using microbial and biogeochemical techniques to investigate hotspots of aerobic nitrogen cycling in San Francisco Bay." *University of Georgia Marine Sciences Seminar Series*, 11/7/16.

“Nitrification from the Pacific Ocean to the Sacramento River: Do distinct microbial communities affect biogeochemical nitrogen cycling in a large urban estuary?” *Stanford University Seminar in Prokaryotic Molecular Biology*, 11/16/15.

CONFERENCE ORAL PRESENTATIONS

([†]designates undergraduate mentee)

Damashek J., A.O. Okotie-Oyekan[†], N.J. Wallsgrove, B. Bayer, G.J. Herndl, B.N. Popp, and J.T. Hollibaugh. “Field rates and physiological mechanisms of polyamine-N oxidation by marine *Thaumarchaeota*.” *2019 Aquatic Sciences Meeting*, 2/23/19 (San Juan, Puerto Rico). **Early Career Travel Award recipient.**

Damashek J., B.M. Satinsky, H.V. Goldberg[†], S. Sharma, J.P. Payet, B.C. Crump, J.T. Hollibaugh, and M.A. Moran. “Targeted analysis of ‘omics data reveals the prevalence of *Nitrosotenuis* spp. *Thaumarchaeota* in low-latitude freshwater ecosystems.” *2018 Southeastern Branch Annual Meeting, American Society for Microbiology (ASM)*, 12/1/2018 (Atlanta, GA).

Damashek J., P.J. Kearns, J.L. Bowen, K.L. Casciotti, and C.A. Francis. “Relating ammonia oxidizer diversity to nitrification throughout the northern San Francisco Bay water column.” *2017 Coastal and Estuarine Research Federation (CERF) Biennial Conference*, 11/8/17 (Providence, RI). **Early Career Travel Award recipient.**

Damashek J., K.L. Casciotti, and C.A. Francis. “Turbid bottom waters and ammonium-rich freshwaters as nitrification hotspots in a large urban estuary (San Francisco Bay, CA).” *2015 American Geophysical Union (AGU) Fall Meeting*, 12/18/15 (San Francisco, CA).

Damashek J., K.L. Casciotti, and C.A. Francis. “Relating ammonia oxidizer communities and gene expression to nitrification across diverse San Francisco Bay waters.” *2015 Coastal and Estuarine Research Federation (CERF) Biennial Conference*, 11/11/15 (Portland, OR).

Damashek J., K.L. Casciotti, and C.A. Francis. “Linking ammonia-oxidizing microbial communities to nitrification rates across the steep gradients of San Francisco Bay (CA, USA) waters.” *2015 Aquatic Sciences Meeting*, 2/24/15 (Granada, Spain). **Outstanding Student Presentation Award recipient.**

Damashek J., K.L. Casciotti, and C.A. Francis. “Microbial ecology and biogeochemical impacts of ammonia-oxidizing microbes in San Francisco Bay waters.” *2014 California Estuarine Research Society Fall Conference*, 9/27/14 (Bodega Bay, CA).

Damashek J., and C.A. Francis. “Population dynamics of ammonia-oxidizing archaea and bacteria during estuarine phytoplankton blooms: How fierce is the fight for ammonium?” *2014 Ocean Sciences Meeting*, 2/24/14 (Honolulu, HI).

Damashek J., K.L. Casciotti, and C.A. Francis. “Nitrification and ammonia-oxidizing microbial communities in the turbid, nutrient-replete waters of San Francisco Bay (CA).” *2013 Coastal and Estuarine Research Federation (CERF) Biennial Conference*, 11/7/13 (San Diego, CA).

Damashek J., S.E. Miller[†], M.F. Kirk, A.M. Martini, S.T. Petsch, J.C. McIntosh, and M.E. Schlegel. “Microbial community structure and geochemistry of the New Albany Shale (Illinois Basin) and its potential to produce biogenic methane.” *2010 Goldschmidt Conference*, 6/17/10 (Knoxville, TN).

Damashek J., J.S. Miller, and R.A. Levin. “Phylogenetics of Chinese *Lycium* (Solanaceae).” *2009 Northeast Undergraduate Research and Development Symposium*, 3/28/09 (Biddeford, ME). **Oral Presentation Award recipient.**

CONFERENCE POSTER PRESENTATIONS

([†]designates undergraduate mentee)

Damashek J., N.J. Wallsgrove, B. Bayer, G.J. Herndl, B.N. Popp, and J.T. Hollibaugh. “Oxidation of polyamine nitrogen by *Thaumarchaeota*-dominated mixed communities and *Thaumarchaeota* isolates from the coastal ocean.” *Fifth International Conference on Nitrification and Related Processes (ICoN5)*, 7/26/17 (Vienna, Austria).

Damashek J., B. Bayer, G.J. Herndl, B.N. Popp, N.J. Wallsgrove, and J.T. Hollibaugh. “Oxidation of polyamine nitrogen by marine *Thaumarchaeota* in the coastal ocean and the laboratory.” *2017 Southeastern Biogeochemistry Symposium*, 4/1/17 (Athens, GA).

Damashek J., T. Challenor[†], K.L. Casciotti, and C.A. Francis. “Nitrification from the Pacific Ocean to the Sacramento River: Do distinct microbial communities affect biogeochemical nitrogen cycling in the waters of a large urban estuary?” *2016 Ocean Sciences Meeting*, 2/22/16 (New Orleans, LA).

Damashek J., T. Challenor[†], K.L. Casciotti, and C.A. Francis. “Factors influencing nitrification rates and ammonia-oxidizing microbes throughout the San Francisco Bay estuary.” *2015 Young Environmental Scholars Conference*, 12/2/15 (Stanford, CA).

Damashek J., T. Challenor[†], K.L. Casciotti, and C.A. Francis. “Biogeochemical effects of shifts in ammonia-oxidizing microbial community structure and gene expression in the waters of Suisun Bay and the Sacramento River.” *2015 State of the San Francisco Estuary Conference*, 9/17/15 (Oakland, CA).

Damashek J., K.L. Casciotti, and C.A. Francis. “Partitioning nitrification between specific archaeal and bacterial clades in a large, nitrogen-rich estuary (San Francisco Bay, CA).” *2014 American Geophysical Union (AGU) Fall Meeting*, 12/16/14 (San Francisco, CA).

Damashek J., K.L. Casciotti, and C.A. Francis. “Can San Francisco Bay ‘filter’ nitrogen between the land and the sea? The microbiology and biogeochemistry of nitrification in estuary waters.” *2014 Bay-Delta Science Conference*, 10/28/14 (Sacramento, CA).

Damashek J., K.L. Casciotti, and C.A. Francis. “Does pelagic nitrification in estuaries ‘filter’ nitrogen between the land and the sea? Microbial and biogeochemical considerations from San Francisco Bay (CA).” *2014 Marine Microbes Gordon Research Conference*, 6/22/14 (Waltham, MA).

Damashek J., and C.A. Francis. "Nitrogen cycling in the mud: Functional gene and biogeochemical analyses of nitrification in a large urban estuary." *2013 Aquatic Sciences Meeting*, 2/21/13 (New Orleans, LA).

Damashek J., and C.A. Francis. "Seasonal dynamics of microbial ammonia oxidation in San Francisco Bay." *2012 American Society for Microbiology General Meeting*, 6/18/12 (San Francisco, CA).

Damashek J., and C.A. Francis. "Aquatic microbial nitrogen cycling: Molecular evidence of planktonic ammonia oxidation in San Francisco Bay." *2011 Beyond the Golden Gate Symposium*, 11/1/11 (San Francisco, CA).

SOCIETY MEMBERSHIPS

American Society for Microbiology (ASM)

Association for the Sciences of Limnology and Oceanography (ASLO)

American Geophysical Union (AGU)

Coastal and Estuarine Research Federation (CERF)

COMMUNITY SERVICE

Mentor

Mountain View (CA) High School Science Olympiad Team (Autumn 2013 to Spring 2014)

Coached two groups of high school students (Water Quality and Disease Detectives events).

Volunteer Teacher

GeoKids, Stanford University (Winter 2011 to Spring 2013)

Led workshops for local elementary school students on geology, including minerals, fossils, and soil.