

Curriculum Vitae

Ryan W. Paerl

Assistant Professor – NC State University
 Department of Marine Earth and Atmospheric Sciences (MEAS)
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Professional Preparation

UNC-Chapel Hill	BS Biology and minor in Chemistry	2004
University of California at Santa Cruz	Ocean Sciences	2011
Scripps Institution of Oceanography, UCSD	Post-doc; Marine microbiology	2011-2014
University of Copenhagen, Helsingør	Post-doc; Marine microbiology	2014-2016

Appointments

Assistant Professor NC State, Department of Marine and Atmospheric Sciences (2017 – present)

Publications (chronological order)

- Yadav, S., Venezia, R. E., **Paerl, R.W.**, M. D. Petters. 2019. Characterization of Ice Nucleating Particles Over Northern India. *Journal of Geophysical Research: Atmospheres*. In press.
- **Paerl, R.W.**, Sundh, J., Tan, D., Svenningsen, S.L., Hylander, S., Pinhassi, J., Andersson, A.F. and Riemann, L. (2018). Prevalent reliance of bacterioplankton on exogenous vitamin B1 and precursor availability. *Proc. Natl. Acad. Sci. U. S. A.* 115, E10447–E10456.
- **Paerl R.W.**, Bertrand, E., Schatt P., Mehiri M., Niehaus T.D., Hanson A.D., Riemann, L., Yves-Bouget, F. (2018). Carboxythiazole is a key microbial nutrient currency and critical component of thiamin biosynthesis. *Scientific Reports*. 8:5940 | DOI:10.1038/s41598-018-24321-2
- **Paerl R.W.**, Hansen T.N.G., Henriksen N.N.S.E., Olesen A.K., Riemann L. (2018). N-fixation and related O₂ constraints on model marine diazotroph *Pseudomonas stutzeri* BAL361. *AME* 81:125-136 | DOI: <https://doi.org/10.3354/ame01867>
- Bombar, D., **Paerl, R. W.**, Anderson, R., & Riemann, L. (2018). Filtration via conventional glass fiber filters in 15N₂ tracer assays fails to capture all nitrogen-fixing prokaryotes. *Frontiers in Marine Science*, 5, 6.
- **Paerl, R.W.**, Bouget, F.Y., Lozano, J.C., Vergé, V., Schatt, P., Allen, E.E., Palenik, B. and Azam, F. (2017). Use of plankton-derived vitamin B1 precursors, especially thiazole-related precursor, by key marine picoeukaryotic phytoplankton. *The ISME journal*, 11(3), 753.
- Bombar, D., **Paerl, R. W.**, Riemann, L. (2016). Marine Non-Cyanobacterial Diazotrophs: Moving beyond Molecular Detection. *Trends in microbiology*, 24(11), 916-927.

- **Paerl, R. W.**, Bertrand E. M., Allen A. E., Palenik B. and Azam F. (2015). Vitamin B1 ecophysiology of marine picoeukaryotic algae: Strain-specific differences and a new role for bacteria in vitamin cycling. *Limnology and Oceanography*, 60: 215–228. doi: 10.1002/lno.10009.
- Moisander PH, Serros T, **Paerl RW**, Beinart RA, Zehr JP. (2014). Gammaproteobacterial diazotrophs and *nifH* gene expression in surface waters of the South Pacific Ocean. *The ISME journal* 8 (10), 1962-1973
- Shilova I.N., Robidart J.C., Tripp H.J., Turk-Kubo K., Wawrik B., Post A.F., Thompson A.W., Ward B., Hollibaugh J.T., Millard A., Ostrowski M., Scanlan D., **Paerl R.W.**, Stuart R. and Zehr J.P. (2013). A microarray for assessing transcription from pelagic marine microbial taxa. *The ISME journal* 8 (7), 1476-1491.
- **Paerl, R.W.**, Tozzi, S., Kolber, Z. and Zehr, J.P. (2012). Variation in *Synechococcus* sp. CC9311 *narB* mRNA abundance relative to changes in light, nitrogen growth conditions and nitrate assimilation. *J Phycology*. 48: 1028-1039.
- Robidart J.C., Preston C.M., **Paerl R.W.**, Turk K.A., Mosier A.C., Francis C.A., Scholin C.A., Zehr J.P. (2012). Seasonal *Synechococcus* and Thaumarchaeal population dynamics examined with high resolution with remote in situ instrumentation. *The ISME journal*. 2012 Mar 1;6(3):513-23.
- **Paerl, R.W.**, Turk, K.A., Beinart, R., Chavez, F.P., and Zehr, J.P. (2012). Seasonal change in the abundance of *Synechococcus* and multiple distinct phylotypes in Monterey Bay determined by *rbcL* and *narB* quantitative PCR. *Environ. Microbiol.* 14: 580-593.
- **Paerl, R.W.**, Johnson, K.S., Welsh, R.M., Worden, A.Z., Chavez, F.P., and Zehr, J.P. (2011). Distinct distributions of select nitrate assimilating *Synechococcus* across the California Current System. *Frontiers in Aquatic Microbiology* 2. Available online: http://www.frontiersin.org/Journal/Abstract.aspx?s=53&name=aquatic_microbiology&ART_Doi=10.3389/fmicb.2011.00059
- Foster, R.A., Kuypers, M. M. M., Vagner, T., **Paerl, R.W.**, Musat, N. and Zehr, J.P. (2011). Nitrogen fixation and transfer in open ocean diatom-cyanobacterial symbioses. *ISME J* 5: 1484–1493.
- Boyd, T.J., Barham, B.P., Hall, G.J., Schumann B.S., **Paerl, R.W.**, and Osburn, C.L. (2010). G00F14 Variation in ultrafiltered and LMW organic matter fluorescence properties under simulated estuarine mixing transects: 2. Mixing with photoexposure. *Journal of Geophysical Research-Part G-BioGeo*. 4. doi 10.1029/2009JG000994.
- Goebel, N.L., Turk, K. A., Achilles, K.M., **Paerl, R.W.**, Hewson, I., Morrison, A.E., Montoya, J.P., Edwards, C. A. and Zehr, J. P. (2010). Abundance and distribution of major groups of diazotrophic cyanobacteria and their potential contribution to N₂ fixation in the tropical Atlantic Ocean. *Environmental Microbiology* 12: 1462-2920.
- Hewson, I. Poretsky, R.S., Beinart, R.A., White, A.E., Shi, T., Bench, S.R., Moisander, P.H., **Paerl, R.W.**, Tripp. H.J., Montoya, J.P., Moran, M.A., Zehr, J.P. (2009). *In situ* transcriptomic analysis of the globally important keystone N₂-fixing taxon *Crocophaera watsonii*. *ISME J*. 3: 618–631.
- Hewson, I. **Paerl, R.W.**, Tripp, J.H., Zehr, J.P. and D. M. Karl. (2009). Metagenomic potential of microbial assemblages in the surface waters of the central Pacific Ocean tracks variability in oceanic habitat *Limnol. Oceanogr.* 54: 1981-1994.

- **Paerl, R.W.**, Foster, R.A., Jenkins, B.D., Montoya, J.P., and Zehr, J.P. (2008). Phylogenetic diversity of cyanobacterial *narB* genes from various marine habitats. *Environ. Microbiol.* 10: 3377-3387.

Professional activities

NC State University Instructor

- Aquatic Microbiology (MEA493/593) Spring 2018- 2019
- Molecular Ecology of Aquatic Microbes (MEA493/591) Fall 2018-2019
- Marine Biology (MEA220) Fall 2019; co-instructor
- Field Investigation of Coastal Processes (MEA459); Summer 2018 – 2019; co-instructor

Reviewer for >15 scientific journals, including

- Estuaries and Coasts
- Environmental Microbiology
- The ISME Journal
- Frontiers in Aquatic Microbiology
- Frontiers in Marine Science
- EOS American Geophysical Union
- Nature Scientific Reports
- Aquatic Microbial Ecology
- Federation of European Microbiological Systems
- Limnology and Oceanography

Reviewer/panelist for the following agencies/organizations

- USC Sea Grant
- NSF
- Agence nationale de la recherche (France National Research Agency)

Society memberships

- Association for the Study of Limnology and Oceanography, 2007 - present
- International Society for Microbial Ecology, 2010 – present
- American Society for Microbiology, 2018 - present
- North Carolina Water Resources Association, 2019 - present

Graduate Advising

- Rebecca Venezia (MS student – primary advisor)
- Nathaniel Curtis (MS student – primary advisor)
- Joel Sanchez (PhD student – primary advisor)
- Michael Walter (MS student – Jay Levine primary advisor)
- Nicole Koerth (MS student – Bill Showers primary advisor)
- Gabrielle Corradino (PhD student – Astrid Schnetzer primary advisor)
- Alexey Katin (PhD student – Daniel Obenour primary advisor)
- Sarah Montoya (MS Microbiology Rotational Student – Spring 2019)
- Rachel Hammer (MS Microbiology Rotational Student – Fall 2019)

Undergraduate Advising

- Jared Mathewson (Independent study advisor)
- Jo Hines (Volunteer research mentor)
- Valerie Dong (Volunteer research mentor)
- Patrick Seebold (Independent study advisor)
- Mackenzie Fiss (Independent study co-advisor)
- Iliana Claudio (Semester @ CMAST, Independent study advisor)
- Kaylee Ransdell (Volunteer research mentor; Independent study advisor)
- Madeline Anderson (Academic advisor)
- Patrick Delaney (Academic advisor)
- Sarah Gahan (Academic advisor)

Graduate committee memberships

- **PhDs in progress as chair or co-chair (Total = 1)**
 - Joel Sanchez
- **PhDs in progress as committee member (Total = 2)**
 - Gabrielle Corradino
 - Alexey Katin
- **Master's in progress as chair or co-chair (Total = 2)**
 - Rebecca Venezia
 - Nathaniel Curtis
- **Master's in progress as committee member (Total = 1)**
 - Michael Walter
- **Master's completed as committee member (Total = 1)**
 - Nicole Koerth

University service

- Department Social Committee, 2017 – present
- Department Web Committee Chair, 2018 – present
- NCSU TRIO McNair Scholars Program Mentor, 2019
- NCSU Microbiology Graduate Program Faculty Member, 2018 - present

Outreach activities

- Mobile Aquatic Microbial Laboratory (MAML) – ‘pop-up’ aquatic microbial lab events held at lake parks in the Research Triangle, NC; 2018-present
- ScienceSaturday public talks, NC Museum of Natural Sciences; 2018-present
- NC Science & Technology Fair Judge; 2017-2019
- Teacher & assistant for 3 ECTS course: Molecular analyses of bacterioplankton composition and function; Helsingør, Denmark; 2017
- MEAS Student Research Symposium Judge; 2018

Most recent presentations

- *Marine microbes take their vitamins too!* Plant Molecular Biology Seminar Series. Thomas Hall NCSU. Raleigh, NC; 8/25/18

- *Revising vitamin B1 use and needs in phytoplankton*. Duke Marine Lab Seminar, Duke Marine Lab – Beaufort, NC, 2/23/18
- *Microbes need their vitamins too!* C-MAST Seminar Series, C-MAST building – Morehead City, NC, 1/12/18
- *Revisiting vitamin auxotrophy and growth limitation in marine plankton*. UNC-CH Marine Sciences Departmental Seminar; Chapel Hill, NC; 11/29/17
- *Cultivation leads to reinvigoration: Revisiting vitamin B1 related marine microbial ecology, Experimentation with non-cyanobacterial marine diazotrophs*. Marine Molecular Microbial Ecology Course; Marine Biological Institute – University of Copenhagen, Helsingor; Helsingor, Denmark; 10/22 – 10/28/17

Graduate and Post-doctoral advisors

- Lasse Riemann, University of Copenhagen, Denmark – postdoctoral advisor
- Farooq Azam, Scripps Institution of Oceanography – postdoctoral advisor
- Jonathan Zehr, University of California at Santa Cruz – PhD thesis advisor