

# MALCOLM ALEXANDER BARNARD

## CURRICULUM VITAE

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Department of Chemistry  
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### EDUCATION

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- Ph.D.** University of Texas at Austin, Analytical Chemistry August 2024-Present  
Advisor: Dr. Jennifer S. Brodbelt  
Area of Emphasis: Biological Mass Spectrometry and Mass Spectrometry Instrumentation
- M.Sc.** Baylor University, Biology May 2024  
Advisor: Dr. J. Thad Scott  
Thesis Title: Extreme stoichiometric gradients and B-vitamin effects on phytoplankton communities
- M.Sc.** University of North Carolina at Chapel Hill, Marine Sciences December 2021  
Advisor: Dr. Hans W. Paerl  
Thesis Title: Adapting oceanic grazing techniques for use in high productivity aquatic ecosystems
- B.Sc.** University of Georgia, Ecology August 2017  
Undergraduate Certificate, Environmental Ethics  
Undergraduate Certificate, Water Resources  
*Cum Laude* with Honors  
Bernard Ramsey Honors Scholar, University of Georgia Honors Program  
CURO Undergraduate Research Scholar, Center for Undergraduate Research Opportunities  
Advisors: Dr. James W. Porter, Dr. Susan B. Wilde, and Dr. Alan P. Covich  
Honors Thesis Title: Utilizing *Spirogyra grevilleana* as a Phytoremediatory Agent for Reduction of Limnetic Nutrients and *Escherichia coli* Concentrations

### PROFESSIONAL EXPERIENCE

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- Graduate Research Assistant and NIH T32 Trainee**, Department of Chemistry August 2024 – Present  
University of Texas at Austin, Austin, TX, USA
- Research Engineering/ Scientist Assistant**, Brodbelt Research Group June 2024 – August 2024  
Department of Chemistry, University of Texas at Austin, Austin, TX, USA
- Tutor**, Statistics and Environmental Science February 2024 – October 2024  
Tutor.com and The Princeton Review, New York, NY, USA (Remote)
- Graduate Teaching and Research Assistant**, Department of Biology August 2022 – December 2023  
Baylor University, Waco, TX, USA
- Data Assistant**, Global Change and Freshwater Ecosystem Analysis Lab May – July 2022  
Center for Reservoir and Aquatic Systems Research, Baylor University, Waco, TX, USA
- Laboratory Technician**, Coastal Environmental and Microbiological Processes Lab January – April 2022  
Institute of Marine Sciences, University of North Carolina at Chapel Hill, Morehead City, NC, USA
- Graduate Teaching and Research Assistant**, Department of Marine Sciences August 2018 – December 2021  
University of North Carolina at Chapel Hill, Chapel Hill, NC, USA
- Summer Intern**, Husbandry Department and Tybee Island Sea Turtle Project May – July 2016  
Tybee Island Marine Science Center, Tybee Island, GA, USA
- Research Assistant**, Odum School of Ecology August 2015 – August 2017  
University of Georgia, Athens, GA, USA
- Research and Teaching Assistant**, Warnell School of Forestry and August 2014 – August 2017  
Natural Resources, University of Georgia, Athens, GA, USA

## PUBLICATIONS

*Peer-Reviewed Journal Articles*

16. Otieno, D., Mwamburi, J., Sitoki, L., Omondi, R., Shitandi, A., Owuor, B., Bullerjahn, G., Ofiso, K., McKay, R.M., Drouillard, K., and **NSF-IRES Lake Victoria Research Consortium** [27 researchers including **Barnard, M.A.**]. Locally produced fish food pellets yield little evidence as a dietary substrate for net pen-reared Nile tilapia (*Oreochromis niloticus*) in Lake Victoria, Kenya. *Journal of Great Lakes Research*. In Press. 102686. DOI: 10.1016/j.jglr.2025.102686.
15. Hart, L.N., Zepernick, B.Z., Natwora, K., Brown, K., Obuya, J.A., Lomeo, D., **Barnard, M.A.**, Okech, E.O., 2022-2023 NSF-IRES Lake Victoria Research Consortium, Kiledal, E.A., Den Uyl, P.A., Olokotum, M., Wilhelm, S.W., McKay, R.M., Drouillard, K.G., Sherman, D.H., Sitoki, L., Achiya, J., Getabu, A., Otiso, K.M., Bullerjahn, G.S., and Dick, G.J. Metagenomics Reveals Temporal Variation in Cyanobacterial Composition, Function, and Biosynthetic Potential in the Winam Gulf, Lake Victoria, Kenya. *Applied and Environmental Microbiology* **2025**, 91 (2), e01507-24. DOI: 10.1128/aem.01507-24. **[Selected as Spotlight Selection]**
14. Paerl, H.W., Chaffin, J.D., Cheshire, J.H., Plaas, H.E., **Barnard, M.A.**, Goerlitz, L.B., Braddy, J.S., Sabo, A., Nelson, L.M., and Yue, L. Dual phosphorus and nitrogen nutrient reduction will be more effective than a phosphorus-only reduction in mitigating diatom and cyanobacterial blooms in Lake Erie, USA-Canada. *Limnology and Oceanography* **2024**, 69 (12), 2913-2928. DOI: 10.1002/lno.12719.
13. Zepernick, B.N., Hart, L.N., Natwora, K.E., Brown, K.M., Obuya, J.A., Olokotum, M., Owino, E., Keating, N.G., Lomeo, D., **NSF-IRES 2022-2023 Lake Victoria Research Consortium** [33 researchers including **Barnard, M.A.**], Sheik, C.S., Sherman, D.H., Dick, G.J., Wilhelm, S.W., Otiso, K.M., McKay, R.M., Bullerjahn, G.S. Metagenomic Sequencing of Cyanobacterial-Dominated Lake Victoria - an African Great Lake. *Microbial Resource Announcements* **2024**, 13 (12), e00798-24. DOI: 10.1128/mra.00798-24.
12. Müller, M., D'Andrilli, J., Silverman, V., Bier, R.L., **Barnard, M.A.**, Lee, M.C.M., Richard, F., Tanentzap, A.J., Wang, J., de Melo, M., and Lu, Y. Machine-based learning approach to examine ecological processes influencing the diversity of riverine dissolved organic matter composition. *Frontiers in Water* **2024**, 6, 1379284. DOI: 10.3389/frwa.2024.1379284.
11. Powers, S.M., **Barnard, M.A.**, Macleod, M.S., Miller, L.A., and Wagner, N.D. Spatially intensive patterns of water clarity in reservoirs determined rapidly with sensor-equipped boats and satellites, *Journal of Geophysical Research: Biogeosciences* **2023**, 128 (10), e2023JG007650. DOI: 10.1029/2023JG007650.
10. Dunn, P.O., Ahmed, I., Armstrong, E., Barlow, N., **Barnard, M.A.**, Belisle, M., Benson, T.J., Berzins, L.L., Boynton, C.K., Brown, T.A., Cady, M., Cameron, K., Chen, X., Clark, R.G., Clotfelter, E.D., Cromwell, K., Dawson, R.D., Denton, E., Forbes, A., Fowler, K., Fraser, K.C., Gandhi, K., Garant, D., Hiebert, M., Houchen, C., Houtz, J., Imlay, T.L., Inouye, B.D., Inouye, D.W., Jackson, M., Jacobson, A.P., Jayd, K., Juteau, C., Kautz, A., Killian, C., Kinneer, E., Komatsu, K.J., Larsen, K., Laughlin, A., Levesque-Beaudin, V., Leys, R., Long, E., Loughheed, S.C., Mackenzie, S., Marangelo, J., Miller, C., Molano-Flores, B., Morrissey, C.A., Nicholls, E., Orlofske, J.M., Pearse, I.S., Pelletier, F., Pitt, A., Poston, J., Racke, D.M., Randall, J.A., Richardson, M.L., Rooney, O., Ruegg, A.R., Rush, S., Ryan, S., Sadowski, M., Schoepf, I., Schulz, L., Shea, B., Sheehan, T.N., Siefferman, L., Sikes, D., Stanback, M., Styrsky, J.D., Taff, C.C., Uehling, J.J., Uvino, K., Wassmer, T., Weglarz, K., Weinberger, M., Wenzel, J., and Whittingham, L.A. Extensive regional variation in the phenology of insects and their response to temperature across North America, *Ecology* **2023**, 104 (5), e4036. DOI: 10.1002/ecy.4036. **[Top Viewed Article in Ecology (2023)]**
9. Stadler, M., **Barnard, M.A.**, Bice, K., de Melo, M.L., Dwivedi, D., Freeman, E.C., Garayburu-Caruso, V.A., Linkhorst, A., Mateus-Barros, E., Shi, C., Tanentzap, A.J., and Miele, C. Applying the core-satellite species concept: Characteristics of rare and common riverine dissolved organic matter, *Frontiers in Water* **2023**, 5, 1156042. DOI: 10.3389/frwa.2023.1156042.
8. Plaas, H.E., Paerl, R.W., Baumann, K., Karl, C., Pendorf, K.J., **Barnard, M.A.**, Chang, N.Y., Curtis, N.P., Huang, H., Mathieson, O.L., Sanchez, J., Maizel, D.J., Bartenfelder, A.N., Braddy, J.S., Hall, N.S., Rossignol, K.L., Sloup, R., and Paerl, H.W. Harmful Cyanobacterial Aerosolization Dynamics in the Airshed of a Eutrophic Estuary, *Science of the Total Environment* **2022**, 852, 158383. DOI: 10.1016/j.scitotenv.2022.158383.
7. Borton, M.A., Collins, S.M., Graham, E.B., Garayburu-Caruso, V.A., Goldman, A.E., de Melo, M.L., Renteria, L., Stegen, J.C., and **WHONDRS crowdsourced consortium** [56 researchers including **Barnard, M.A.**]. It takes a village: using a crowdsourced approach to investigate organic matter

- composition in global rivers through the lens of ecological theory, *Frontiers in Water* **2022**. 4, 870453. DOI: 10.3389/frwa.2022.870453.
6. Barnard, M.A., Emani, S.R., Fortner, S.K., Haygood, L., Sun, Q., White-Newsome, J.L., and Zaitchik, B. GeoHealth Perspectives on Integrated, Coordinated, Open, Networked (ICON) Science, *Earth and Space Science* **2022**. 9 (5), e2021EA002157. DOI: 10.1029/2021EA002157.
  5. Dwivedi, D., Santos, A.L.D., Barnard, M.A., Crimmins, T.M., Malhotra, A., Rod, K.A., Aho, K.S., Bell, S.M., Bomfim, B., Brearley, F.Q. and Cadillo-Quiroz, H., Chen, J., Gough, C.M., Graham, E.B., Hakkenberg, C.R., Haygood, L., Koren, G., Lilleskov, E., Meredith, L.K., Naeher, S., Nickerson, Z.L., Pourret, O., Song, H.-S., Stahl, M., Taş, N., Vargas, R., and Weintraub-Leff, S. Biogeosciences Perspectives on Integrated, Coordinated, Open, Networked (ICON) Science, *Earth and Space Science* **2022**. 9 (3), e2021EA002119. DOI: 10.1029/2021EA002119.
  4. Barnard, M.A., Chaffin, J.D., Plaas, H.E., Boyer, G.L., Wei, B., Wilhelm, S.W., Rossignol, K.L., Braddy, J.S., Bullerjahn, G.S., Bridgeman, T.B., Davis, T.W., Wei, J., Bu, M., Paerl, H.W. Roles of Nutrient Limitation on Western Lake Erie CyanoHAB Toxin Production, *Toxins* **2021**. 13 (1), 47. DOI: 10.3390/toxins13010047. [Selected as Editor's Choice]
  3. Paerl, H.W., Hall, N.S., Hounshell, A.G., Rossignol, K.L., Barnard, M.A., Luettich, R.A. Rudolf, J.C., Osburn, C.L., Bales, J., and Harding, L.W. Recent increases of rainfall and flooding from tropical cyclones (TCs) in North Carolina (USA): implications for organic matter and nutrient cycling in coastal watersheds, *Biogeochemistry* **2020**. 150 (2), 197–216. DOI: 10.1007/S10533-020-00693-4. Reprinted in a special issue as *Biogeochemistry* **2023**. 164, 257-276 DOI: 10.1007/s10533-021-00770-2.
  2. Paerl, H.W. and Barnard, M.A. Mitigating the global expansion of harmful cyanobacterial blooms: Moving targets in a human- and climatically-altered world, *Harmful Algae* **2020**. 96, 101845. DOI: 10.1016/j.hal.2020.101845.
  1. Barnard, M.A., Porter, J.W., and Wilde, S.B. Utilizing *Spirogyra grevilleana* as a Phytoremediatory Agent for Reduction of Limnetic Nutrients and *Escherichia coli* Concentrations, *American Journal of Plant Sciences* **2017**. 8 (5), 1148-1158. DOI: 10.4236/ajps.2017.85075.

### Patents

2. Barnard, M.A., Algal System for Improving Water Quality. CA 2951817C, 2022.
1. Barnard, M.A., Algal System for Improving Water Quality. US 10065876B2, 2018.

### Peer-Reviewed Conference Proceedings

1. Barnard, M.A., Plaas, H.E., Paerl, R.W., Karl, C.M., Holland, W.C., Hardison, D.R., Hall, N.S., Bartenfelder, A.N., Rossignol, K.L., Braddy, J.S., Sloup, R.S., and Paerl, H.W., Macronutrient and B vitamin dynamics of Chowan River (North Carolina, U.S.A.) CyanoHABs: pp. 100-105, In: Band-Schmidt, C.J. and Rodríguez-Gómez, C.F. (Eds.). 2022. Proceedings of the 19th International Conference on Harmful Algae, La Paz, B.C.S., Mexico. International Society for the Study of Harmful Algal Blooms. 365 pp. DOI: 10.5281/zenodo.7034970.

### Book Chapters

1. Barnard, M.A., Chaffin, J.D., Plaas, H.E., Boyer, G.L., Wei, B., Wilhelm, S.W., Rossignol, K.L., Braddy, J.S., Bullerjahn, G.S., Bridgeman, T.B., Davis, T.W., Wei, J., Bu, M., and Paerl, H.W. Roles of Nutrient Limitation on Western Lake Erie CyanoHAB Toxin Production: pp. 183-203. In: Kaloudis, T., Hiskia, A., Triantis, T.M. (Eds.). 2022. Cyanotoxins in Bloom: Ever-Increasing Occurrence and Global Distribution of Freshwater Cyanotoxins from Planktic and Benthic Cyanobacteria. MDPI Books; Basel, CH.; 1<sup>st</sup> ed. 386 pp. DOI: 10.3390/books978-3-0365-3921-8. (Article Reprint)

### Repository Papers

3. Barnard, M.A. and Peissig, J.M. 2016. "Effects of Light Pollution on Loggerhead Sea Turtle (*Caretta caretta*) Nesting Behavior in Georgia and South Carolina," University of Georgia Athenaeum Repository. Paper ID: 10724/35551. SeaTurtle.org Paper ID: 9775.

2. **Barnard, M.A.** 2015. “A Survey of the Tidal Cycle Influence on the Differential Phytoplankton Diversity of the Duplin River at Marsh Landing on Sapelo Island, Georgia,” University of Georgia Athenaeum Repository. Paper ID: 10724/35550.
1. **Barnard, M.A.**, Brock, H.K., Campbell, P., and Peissig, J.M. 2015. “Soil Manipulation by Leaf Cutter Ants at La Selva Biological Station, Puerto Viejo, Costa Rica,” University of Georgia Athenaeum Repository. Paper ID: 10724/35605.

### *Code, Data, and Software*

7. **Barnard, M.A.** 2024 “GitHub: malcolmbarnard/BarnardetalLimnocorralBioassay” DOI: 10.5281/zenodo.11100023.
6. **Barnard, M.A.** 2024 “GitHub: malcolmbarnard/BaylorThesisCodeAndData” DOI: 10.5281/zenodo.8374496.
5. Macleod, M., **Barnard, M.**, and Powers, S. 2023. Spatial Survey of Water Quality in Lake Arrowhead, TX, USA ver 1. Environmental Data Initiative. DOI: 10.6073/pasta/c36762ccc4d9a23c805004129bfa5c5e.
4. Dunn, P.O., Ahmed, I., Armstrong, E., Barlow, N., **Barnard, M.A.**, Belisle, M., Benson, T.J., Berzins, L.L., Boynton, C.K., Brown, T.A., Cady, M., Cameron, K., Chen, X., Clark, R.G., Clotfelter, E.D., Cromwell, K., Dawson, R.D., Denton, E., Forbes, A., Fowler, K., Fraser, K.C., Gandhi, K., Garant, D., Hiebert, M., Houchen, C., Houtz, J., Imlay, T.L., Inouye, B.D., Inouye, D.W., Jackson, M., Jacobson, A.P., Jayd, K., Juteau, C., Kautz, A., Killian, C., Kinnear, E., Komatsu, K.J., Larsen, K., Laughlin, A., Levesque-Beaudin, V., Leys, R., Long, E., Loughheed, S.C., Mackenzie, S., Marangelo, J., Miller, C., Molano-Flores, B., Morrissey, C.A., Nicholls, E., Orlofske, J.M., Pearse, I.S., Pelletier, F., Pitt, A., Poston, J., Racke, D.M., Randall, J.A., Richardson, M.L., Rooney, O., Ruegg, A.R., Rush, S., Ryan, S., Sadowski, M., Schoepf, I., Schulz, L., Shea, B., Sheehan, T.N., Siefferman, L., Sikes, D., Stanback, M., Styrsky, J.D., Taff, C.C., Uehling, J.J., Uvino, K., Wassmer, T., Weglarz, K., Weinberger, M., Wenzel, J., and Whittingham, L.A. 2023. Data Set for Extensive regional variation in the phenology of insects and their response to temperature across North America, Figshare. DOI: 10.6084/m9.figshare.20415819.v1.
3. **Barnard, M.A.** 2022 “GitHub: malcolmbarnard/Barnard\_Paerl\_bioRxiv” DOI: 10.5281/zenodo.5898592.
2. **Barnard, M.A.** 2021 “GitHub: malcolmbarnard/GrazingMethodDevelopment” DOI: 10.5281/zenodo.5026535.
1. **Barnard, M.A.** 2020. “GitHub: malcolmbarnard/WLE\_Barnard\_et\_al\_Toxins” DOI: 10.5281/zenodo.4281127.

### *Published Protocols*

2. **Barnard, M.A.** and Powers, S.M. 2023. “Disposal of Environmental Samples from Water Bodies Infested with Zebra Mussels.” Protocols.io. DOI: 10.17594/protocols.io.eq2lynymvx9/v2.
1. **Barnard, M.A.** 2021. “Protocol for Creating Major Ion Solutions for Freshwater Systems.” Protocols.io. DOI: 10.17504/protocols.io.bvyxn7xn.

### **AWARDED GRANTS AND FELLOWSHIPS**

1. **American Chemical Society (ACS) Committee on Environmental Improvement and Committee on Local Section Activities Mini-Grant for Sustainability Programming**, (2020) Establishing a Diversity in the Chemical Sciences seminar series through the Eastern North Carolina Local Chapter (\$500)
2. **Kenan Graduate Student Award**, (2019) “Using stable isotopes to identify fertilizer-derived nitrogen (N) assimilation in microcystins” (\$2500)
3. **Sigma Xi Grants-in-Aid of Research**, (2019) “Understanding the effects of grazing on CyanoHAB toxicity” (\$750)

### **TEACHING EXPERIENCE**

<b>Teacher of Record/Graduate Teaching Assistant</b> , Baylor University (BIO 1105) “Modern Concepts in Bioscience Lab”	August 2022-May 2023 Fall 2022, Spring 2023
<b>Graduate Research Consultant</b> , University of North Carolina at Chapel Hill (ENEC 222/MASC 470) “Estuarine and Coastal Marine Science” (MASC 220/ENEC 220) “North Carolina Estuaries: Environmental Processes & Problems”	May 2019-December 2021 Fall 2021 May 2019

<b>Teaching Assistant</b> , University of North Carolina at Chapel Hill (MASC 401/BIOL 350/ENVR 417/GEOL 403) “Oceanography” (ENEC 433/MASC 433) “Wetland Hydrology and Hydrodynamics”	August 2018-May 2019 Spring 2019 Fall 2018
<b>Teaching Assistant</b> , University of Georgia (FYOS 1001) “First Year Odyssey Seminar – Aquatic Life in UGA Watersheds”	August-December 2016 Fall 2016

## CONFERENCE PRESENTATIONS

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### Oral Presentations

1. “Evaluating the FluoroProbe as a tool for rapid chlorophyll a and phytoplankton group identification during Western Lake Erie CyanoHAB bloom conditions,” 12<sup>th</sup> International Conference on Toxic Cyanobacteria. University of Toledo, Toledo, OH, USA, May 2022. <https://scholarworks.bgsu.edu/ictc/2022/002/6/>
2. “Size-fractionated phytoplankton grazing rate determination across the freshwater-to-marine continuum,” 2022 Joint Aquatic Sciences Meeting. Grand Rapids, MI, USA, May 2022.
3. “Nutrient Dynamics of Microcystin and Anatoxin Production in the Western Lake Erie Cyanobacterial Harmful Algal Blooms,” Society of Environmental Toxicology and Chemistry 2021 North America SciCon4 Virtual Conference. Portland, OR, USA, November 2021.
4. “Macronutrient and B vitamin dynamics of Chowan River (North Carolina, USA) CyanoHABs,” 19<sup>th</sup> International Conference on Harmful Algae (Virtual). La Paz, BCS, Mexico, October 2021.
5. “Macronutrient and vitamin influences on Chowan River (North Carolina, USA) cyanobacterial harmful algal bloom biomass and toxicity,” American Chemical Society Fall 2021 National Meeting. Atlanta, GA, USA, August 2021. Presentation is available at <https://doi.org/10.1021/scimeetings.1c01003>.
6. “Nutrient limitation dynamics of Western Lake Erie CyanoHAB biomass, microcystin, and anatoxin production,” International Association for Great Lakes Research Virtual Annual Conference. Michigan Technical University, Houghton, MI, USA, May 2021.
7. “Nutrient limitation dynamics of Western Lake Erie cyanoHAB biomass and toxin production,” American Chemical Society Virtual Spring 2021 National Meeting. San Francisco, CA, USA, April 2021. Presentation is available at <https://doi.org/10.1021/scimeetings.1c00521>.
8. “Utilizing the Alga *Spirogyra* to Improve Limnetic Water Quality: A Phytoremediatory Approach to Nutrient and Bacterial Pollution,” Association for the Sciences of Limnology and Oceanography 2018 Summer Meeting, Victoria, BC, Canada, June 2018.
9. “Utilization of *Spirogyra grevilleana* as a Method of Algal Filtration for Reduction of Limnetic Nutrient and *Escherichia coli* Levels,” Center for Undergraduate Research Opportunities Symposium, Athens, GA, USA, March 2015.
10. “Utilization of *Spirogyra grevilleana* as a Method of Algal Filtration for Reduction of Limnetic Nutrient and *Escherichia coli* Levels,” Georgia Association of Water Professionals Industrial Conference, Athens, GA, USA, March 2015.

### Poster Presentations

1. “Separation and structural analysis of bioactive cyclic peptides using UVPD-MS with capillary electrophoresis and liquid chromatography,” 73rd ASMS Conference on Mass Spectrometry and Allied Topics. Baltimore, MD, USA, June 2025.
2. “Perspectives on Advancing GeoHealth Through Integrated, Coordinated, Open, Networked (ICON) Science: Recommendations for Future Work,” Cell, Molecular, Health, and Disease/Ecology, Evolution, and Organismal Graduate Student Society (CEGSS) Symposium. Baylor University, Waco, TX, USA, April 2023.
3. “Effects of B Vitamins on Experimental Pond Phytoplankton Communities Across a Stoichiometric Gradient,” American Geophysical Union Fall 2022 Meeting. Chicago, IL, USA, December 2022.
4. “Advancing GeoHealth Through Integrated, Coordinated, Open, Networked (ICON) Science: Recommendations for Future Work,” American Geophysical Union Fall 2022 Meeting. Chicago, IL, USA, December 2022.
5. “Macronutrient and B vitamin drivers of the Chowan River (North Carolina, USA) CyanoHABs,” 2022 Graduate Research Showcase. Baylor University, Waco, TX, USA, October 2022.

6. "Evaluating FluoroProbe as a tool for rapid chlorophyll a and phytoplankton group differentiation during bloom conditions," Oceans and Human Health Virtual Meeting 2021. Bowling Green State University, Bowling Green, OH, USA, October 2021.
7. "Macronutrient and vitamin influences on the Chowan River (North Carolina, USA) CyanoHABs," 10.5 US Symposium on Harmful Algae Virtual Meeting. Virtual, USA, May 2021.
8. "Nutrient limitation dynamics of the Western Lake Erie CyanoHABs," Oceans and Human Health Virtual Meeting 2020. Woods Hole, MA, USA, October 2020.
9. "Understanding the roles of nutrient limitation on the Western Lake Erie Cyanobacterial Harmful Algal Blooms," North Carolina State University LW Parks Lectureship ePoster Session. Raleigh, NC, USA, September 2020.
10. "Use of <sup>15</sup>N compound specific analysis to trace N assimilation into microcystins in toxic cyanobacterial harmful algal blooms (cyanoHABs)," American Chemical Society 2019 Eastern North Carolina Poster Session, Greenville, NC, USA, November 2019.
11. "Utilizing *Spirogyra grevilleana* as a Phytoremediatory Agent for Reduction of Limnetic Nutrients and *Escherichia coli* Concentrations," 2018 European Geosciences Union General Assembly, Vienna, Austria, May 2018. Poster available on <http://essoar.org>.  
<https://doi.org/10.1002/essoar.884a8536f683a34d.b4c20790a6644e17.2>.
12. "Providing Potable Water from Lake Water: The Frontiers of Sustainability in Your Own Backyard," Ecological Society of America's Centennial Conference, Baltimore, Maryland, USA, August 2015.
13. "Utilization of *Spirogyra grevilleana* as a Method of Algal Filtration for Reduction of Limnetic Nutrient and *Escherichia coli* Levels," International Erosion Control Association Environmental Connection Conference, Portland, OR, USA, February 2015.
14. "Utilization of *Spirogyra grevilleana* as a Method of Algal Filtration for Reduction of Limnetic Nutrient and *Escherichia coli* Levels," UGA Sustainability Science Symposium, Athens, GA, USA, January 2015.
15. "Utilization of *Spirogyra grevilleana* as a Method of Algal Filtration for Reduction of Limnetic Nutrient and *Escherichia coli* Levels," Odum School of Ecology Graduate Symposium, Athens, GA, USA, January 2015.
16. "Utilization of *Spirogyra grevilleana* as a Method of Algal Filtration for Reduction of Limnetic Nutrient and *Escherichia coli* Levels," Georgia Association of Water Professionals Annual Conference, Savannah, GA, USA, July 2014.
17. "Utilization of *S. grevilleana* as a Novel Method of Bioremediation in Freshwater Lakes," Georgia Association of Water Professionals Annual Conference, Savannah, GA, USA, July 2013.

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#### INVITED TALKS

1. **Invited Seminar**, "My scientific journey studying harmful algal blooms," Science Talks Seminar Series, Wakefield High School, Arlington, VA, USA, November 2022.
2. **Brown Bag Seminar**, "The effects of nutrients and vitamins on the Chowan River CyanoHABs," Institute of Marine Sciences, University of North Carolina at Chapel Hill, Morehead City, NC, USA, February 2021.
3. **Invited Seminar**, "Using FluoroProbes to Rapidly Quantify CyanoHABs," Mostly Marine Informal Seminar Series, Duke University Marine Laboratory, Beaufort, NC, USA, May 2020.
4. **Brown Bag Seminar**, "Understanding Western Lake Erie CyanoHAB Bloom Dynamics," Institute of Marine Sciences, University of North Carolina at Chapel Hill, Morehead City, NC, USA, January 2020.
5. **National Wildlife Federation EcoLeader Panel**, Georgia Campus Sustainability Network Annual Conference, Atlanta, GA, USA, September 2016.
6. **TEDx Talk**, "Solving the Global Water Crisis," TEDxUGA Student Idea Competition, one of nine students campus-wide selected to present, Athens, GA, USA, January 2015.
7. **National Wildlife Federation Speech**, "The Importance of Volunteering in Your Community," Disney Kids and Nature Celebration, Orlando, FL, USA, February 2012.
8. **TEDx Talk**, "Follow Your Dreams," TEDxYouth@PiedmontPark, Atlanta, GA, USA, November 2011.

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#### MENTORING

##### *Undergraduates Mentored*

**University of Texas at Austin:** 2024: Kailyn Nonhof (co-mentored), 2024-Present: Skylar Pfeil

**Baylor University:** 2022: Conrad Harvill, Kalea Kim, Rachel Walkup, 2023: Andrew Mason, Sara Coppelletti

**University of North Carolina at Chapel Hill:** 2019: Felix Evans, 2020: Kelly Puente, 2021: Leah Nelson

**SELECTED HONORS AND AWARDS**

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<b>NIH T32 Training Grant Fellowship in Project-to-Product Team Entrepreneurship and Active Mentoring</b> , National Institutes of Health National Institute of General Medical Sciences	2025-Current
<b>Department of Chemistry Graduate Research Fellowship</b> , Awarded by the University of Texas at Austin's Department of Chemistry through the Dr. Bennie F. Walker Endowment	2024
<b>Distinguished K-12 Tutor</b> , Awarded by Tutor.com and The Princeton Review for opting to become a fingerprint approved tutor. The digital certificate is available here: <a href="https://accreditable.tutor.com/e04a8770-029d-4b68-8705-400e6ae2814d">https://accreditable.tutor.com/e04a8770-029d-4b68-8705-400e6ae2814d</a> .	2024
<b>Advanced Studies Institute on Water Quality and Harmful Algal Blooms in Lake Victoria, Kenya</b> One of seven US participants chosen as part of an NSF-IRES funded research trip to study harmful algal blooms on the Kenyan portion of Lake Victoria including a research cruise on the R/V Uvumbuzi	2023
<b>Cornelia M. Smith Fellowship</b> , Awarded by the Baylor University Department of Biology	2023
<b>Audience Choice Award in 2022 Baylor University Graduate Research Showcase</b>	2022
<b>Baylor University Graduate Travel Award</b> , Awarded by the Baylor University Graduate School	2022
<b>Baylor University Transition Fellowship</b> , Awarded by the Baylor University Graduate School	2022
<b>Registration Fee Award for the 2021 International Conference on Harmful Algae</b> , Awarded by US National Office for Harmful Algal Blooms on behalf of National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science	2021
<b>IAGLR Science Communication Scholar</b> , Recognized by the International Association of Great Lakes Research as an IAGLR 2021 Student Presentation Award Finalist	2021
<b>2020 National Science Foundation Graduate Research Fellowship Honorable Mention</b>	2020
<b>Kenan Graduate Student Award</b> , Awarded by the Department of Marine Sciences, University of North Carolina at Chapel Hill	2019
<b>Election to Full Membership, Sigma Xi</b>	2018
<b>Josh Laerm Memorial Outstanding Ecology Undergraduate Award</b> Awarded to a graduating senior Ecology major at University of Georgia based on a combination of research, classroom, and service performance ( <i>i.e.</i> , all-around qualities as a professional ecologist)	2017
<b>1<sup>st</sup> place in University of Georgia Sustainability Science Symposium poster session</b>	2015
<b>2<sup>nd</sup> place in Odum School of Ecology Graduate Symposium poster session</b>	2015
<b>University of Georgia Bernard Ramsey Honors Scholar</b> Four-year academic scholarship including full tuition and international study funding	2014
<b>IBM Watson Scholarship</b> , Four-year academic scholarship	2014
<b>U.S. National Stockholm Junior Water Prize</b> , State of Georgia winner for algal research	2013, 2014
<b>Georgia's 20 Under 20, 21<sup>st</sup> Century Leaders</b>	2012
<b>2011 Atlanta Cox Conserves Heroes Finalist</b> , Cox Enterprises and The Trust for Public Land Awarded for contribution to community conservation	2011

**PROFESSIONAL TRAINING / CERTIFICATION**

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<b>Teaching Preparation Workshop Series</b> , completed workshops on "How We Learn", "Disability and Access", "Grading and Feedback", and "Facilitating Discussions" (Fall 2024 Semester), "Preparing for the First Day of Teaching", "Lesson Planning", "Drafting Your Teaching Statement", and "Giving Good Feedback" (Spring 2025 Semester), "Facilitating Effective Labs" and "Student-Centered Teaching Strategies" (Fall 2025). Center for Teaching and Learning, The University of Texas at Austin, Texas, USA (2024-2025)
<b>My Green Labs Ambassador</b> , My Green Labs (2025)
<b>Mini Course in Characterizing Compounds by NMR</b> , Department of Chemistry, University of Texas at Austin, Texas, USA (2025)
<b>Capillary Electrophoresis-Mass Spectrometry Summer School</b> , Sun Laboratory, Department of Chemistry, Michigan State University, Michigan, USA (2025)
<b>How to Make a Graduate Data Portfolio Workshop</b> , Office of Career and Life Design, Graduate School, University of Texas at Austin, Texas, USA (2025)
<b>Responsible Conduct in Research Training Workshop</b> , Completed one day workshop through the Department of Biomedical Engineering, University of Texas at Austin (2025)



**Teaching Preparation Certificate**, Certificate of completion for the Teaching Preparation Workshop Series (Fall 2024 Semester), Center for Teaching and Learning, The University of Texas at Austin, Texas, USA (2024)

**Baylor Data Scholar Certificate**, Completed workshops in the following areas: Data Visualizer, Text Data Miner, Research Data Manager, and Secondary Data Finder, Baylor University Libraries Digital Scholarship, Waco, Texas, USA (2023). All digital certificates are available here: <https://badgr.com/public/collections/a5af022e30544a42a6727d69ec0a4dbb>.

**QPR Suicide Prevention Gatekeeper Training**, Question, Persuade, and Refer suicide prevention training, Baylor University Counseling Center, Waco, Texas, USA (2023)

**Isotope Ratio Analysis Using the Orbitrap Mass Spectrometer**, Pre-American Geophysical Union Fall Meeting 2022 Workshop, Chicago, Illinois, USA (2022)

**Portal to the Public Training**, Mayborn Museum, Baylor University, Waco, Texas, USA (2022)

**United States Federal Aviation Administration (FAA) Remote Pilot**, Airman Rating: Small Unmanned Aircraft Systems (FAA Part 107) – Airman Certificate Number 4689986 (Issued July 2022)

**Science Communication Workshop**, Phipps Conservatory and Botanical Gardens, Pittsburgh, Pennsylvania, USA (remote) (2022)

**NASBLA/United States Coast Guard Boater Education**, Texas Certificate Number 1990750 from Texas Parks and Wildlife Department (2022); North Carolina Certificate Number 13066411 from North Carolina Wildlife Resources Commission (2019)

**Twitter for Science 101**, University of North Carolina – Chapel Hill Department of Earth, Marine, and Environmental Sciences, North Carolina, USA (2021)

**Unlearning Racism in Geosciences (URGE) Training**, UNC Marine and Geosciences Pod Member (2021)

**Diver First Aid (DFA) Pro (CPR-HCP, First Aid, AED, O<sub>2</sub> Provider)**, Divers Alert Network (2020)

**Pursuing Respect, Inclusion, Diversity, and Equity (PRIDE) Training**, Duke University Center for Sexual and Gender Diversity, Duke University Marine Lab, North Carolina, USA (2020)

**Scientific Diving Certification – American Academy of Underwater Science**, University of North Carolina (2019-2020), University System of Georgia (2016-2017)

**2019 ComSciCon-Triangle Science Communication Training Workshop**, Raleigh/Research Triangle Park, North Carolina, USA (2019)

**SciREN Coast**, Lesson Plan Workshop at Duke University Marine Lab, North Carolina, USA (2019)

**Entering Mentoring Training Workshop**, University of North Carolina – Chapel Hill Graduate School, North Carolina, USA (2019)

**University of North Carolina – Chapel Hill Safe Zone Training**, University of North Carolina – Chapel Hill LGBTQ Center, North Carolina, USA (2018)

**Helping Advocates for Violence Ending Now (HAVEN) Training**, University of North Carolina – Chapel Hill Equal Opportunity & Compliance Office, North Carolina, USA (2018)

**Methods in Environmental Acquisition / Remote Data Acquisition (RDA) Sensor Training Workshop**, University of New Mexico, Sevilleta Field Station, New Mexico, USA (2018)

**Introduction to Remote Sensing and GIS for Ecological Applications**, PR Informatics, Glasgow, Scotland, UK (2018)

**Stable Isotope Ecology Course**, Sicily Center for International Education, Siracusa, Sicily, Italy (2018)

**University of Georgia Sustaining Human Societies and the Natural Environment Winter Break Semester in Australia**, Sydney, Brisbane, Outback, Noosa, and Lady Elliot Island, Australia (December 2016 - January 2017)

**Master SCUBA Diver, Scuba Schools International Certification**, Stress and Rescue (2017), Navigation, Deep, Wreck, Night/Reduced Visibility, and Nitrox (2016)

**Georgia Soil and Water Conservation Commission Level 1-A Certified Personnel/Blue Card Holder**, Georgia NPDES Training Institute (2016-2018)

**University of Georgia Coastal Summer Semester**, UGA Marine Institute, Sapelo Island, GA, USA and Skidaway Institute of Oceanography, Skidaway Island, GA, USA (June 2015)

**University of Georgia Tropical Ecology Maymester in Costa Rica**, La Selva Biological Station, Playa Grande, and UGA Costa Rica campus at San Luis de Monteverde, Costa Rica (May 2015)

**Georgia Adopt-A-Stream QA/QC Certification**, State of Georgia’s Environmental Protection Division Chemical (2009, 2010, 2016); Biological (2010, 2016); and Bacterial (2012) water quality testing



**SELECTED UNIVERSITY INVOLVEMENT**

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<b>University of Texas at Austin</b> – My Green Labs Freezer Challenge Lab Lead for the Brodbelt Lab	2025-Present
<b>University of Texas at Austin</b> – Chemistry Student Safety Organization, Communications Officer and Communications Committee Chair (2025-2026) Peer-to-Peer Walk Through Committee Member (2024-2025)	2024-Present
<b>Baylor University</b> - Global Change and Freshwater Ecosystem Analysis Lab Group Safety Compliance Liaison	2022-2023
<b>University of North Carolina – Chapel Hill</b> – Marine Sciences Department Diversity, Equity, and Inclusion Committee Member	2020-2021
<b>University of North Carolina – Chapel Hill</b> – Marine Sciences Graduate Student Symposium Co-Chair	2019-2020
<b>University of Georgia University Council</b> – Odum School of Ecology Student Representative, Library Committee Member	2016-2017
<b>University of Georgia Student Government Association</b> – Odum School of Ecology Senator, Auxiliary Services Committee Chair	2015-2017
<b>American Water Resources Association, UGA Chapter</b> – Treasurer	2015-2017
<b>National Wildlife Federation</b> – Campus EcoLeader	2014-2017

**SELECTED PROFESSIONAL SERVICE**

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**Protocols.io Ambassador**, 2022-2024  
**North Carolina American Water Works Association/Water Environment Association (NC AWWA/WEA) Public Education Committee Member**, 2018-2022  
**Eastern North Carolina Section of the American Chemical Society Diversity in the Chemical Sciences Seminar Series Coordinator**, 2020-2021  
**Peer Reviewer**  
 Academia Letters, Aquatic Ecology, Aquatic Toxicology, Coral Reefs, Critical Reviews in Environmental Science and Technology, Data, Environmental Science & Technology, GeoHealth, Harmful Algae, Hydrobiology, Journal of Applied Phycology, Journal of Geophysical Research – Biogeosciences, Life, Life: The Excitement of Biology, Microbial Ecology, Microorganisms, New Zealand Journal of Marine and Freshwater Research, PCIEcology, Phycology, Plants, Sustainability, Toxins, Water

**PROGRAMING AND SOFTWARE PROFICIENCIES**

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**MatLab**, Mathematical modeling  
**R/R Studio**, Statistical analysis utilizing **LaTeX** for formatting  
**Python**, mathematical modeling and statistical analysis  
**Grass GIS**, Open Source Global Information Systems Software  
**P.A.S.T.**, Population analysis  
**JMP**, Statistics and population modeling  
**CRBasic**, Campbell Data Loggers programming

**SELECTED COMMUNITY OUTREACH**

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**Future City Competition**, International Competition Judge, March 2021 and February 2022. North Carolina Regional Judge, December 2021-January 2022.  
**Blue Heron Ocean Sciences Bowl**, Manteo, NC Science Judge, February 2021; Morehead City, NC Moderator, February 2022.  
**Skype a Scientist**, Presenter, 2020 – current. Communicating science to school students and campers.  
**North Carolina Stockholm Junior Water Prize**, State Judge, 2019-2022. Acting as member of the North Carolina Water Environment Association Public Education Committee, helped to select the North Carolina state Stockholm Junior Water Prize winner.

**North Carolina Science and Engineering Fair**, Judge – **Region I** February 2020; **Region II** February 2019 and February 2022; **Region IIIB** February 2021 and February 2022; **Region V** February 2019 and February 2022, **Region VI** February 2022; **State Fair**, March 2022.

**SciREN Coast**, Admin Team member and Educator Team leader, 2019-2021.

**Future City Competition**, Mentor, 2020 Future City Competition, October 2019-December 2019. Mentored one team of seventh graders and two teams of eighth graders at Epiphany School of Global Studies in New Bern, North Carolina, USA.

**Science Fair**, Mentor, November 2019-December 2019. Mentored eighth grade students at Beaufort Middle School, Beaufort, North Carolina, USA

**Raleigh Model Water Competition**, Volunteer, October 2019. Judged at the 2019 Model Water Competition hosted by the North Carolina Water Environment Association at Abbotts Bridge Elementary School, Raleigh, North Carolina, USA.

**Girls Exploring Science and Technology**, Volunteer, October 2019. Volunteered at the 2019 Girls Exploring Science and Technology event at the University of North Carolina – Chapel Hill Institute of Marine Sciences, Morehead City, North Carolina, USA.

**United States National Stockholm Junior Water Prize**, Coach, June 2019. Mentored students at 2019 United States National Stockholm Junior Water Prize competition at The Ohio State University, Columbus, Ohio, USA.

**Georgia DNR Tybee Island Sea Turtle Project**, Sea Turtle Patrol, 2014-2018. Conducted morning beach surveys, nocturnal nest sitting, nest transfers, and egg genetic sample field preparation.

**Tybee Island Marine Science Center**, Volunteer, 2011-2018. Educated visitors through gallery interpretation and assistance with beach walks, husbandry, and research.

**National Park Service**, Park Volunteer, 2010-2018. Assisted with educational programs, event preparation, and park cleanup at the Chattahoochee River National Recreation Area.

**Upper Oconee Watershed Network**, Volunteer, 2015-2017. Quarterly water quality monitoring of Athens-Clarke County, GA streams.

**Georgia State Science and Engineering Fair**, Junior Division Science Fair Judge, Athens, GA, April 2016.

**National Wildlife Federation**, Project leader and volunteer, 2010-2017, Youth Ambassador, 2010-2014. Created and led Johns Creek Certified Community Wildlife Habitat Project.

**Chattahoochee Nature Center**, Docent, 2009-2014. Completed docent training program, educated visitors through artifact biobuggies and exhibit gallery interpretation.

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#### SELECTED ANALYTICAL AND INSTRUMENT PROFICIENCIES

Capillary Electrophoresis  
 Circular Dichroism Spectrometry  
 Elemental Analysis (Flash Combustion GC-IR and GC-TCD)  
 Flow Cytometry and Cell Sorting  
 Fluorometry  
 Freeze Drying  
 Gas Chromatography (GC)  
 High Performance Liquid Chromatography (HPLC) – both nanoflow and microflow  
 Ion Mobility Spectrometry  
     Drift Tube  
     Trapped Ion Mobility  
 Liquid Scintillation Counting  
 Mass Spectrometry  
     Charge Detection Mass Spectrometry  
     Orbitrap Mass Spectrometry  
     Time of Flight Mass Spectrometry (TOF)  
     Linear Ion Trap Mass Spectrometry  
     Ion Coupled Plasma Mass Spectrometry  
 Microscopy  
     Light Microscopy  
     Epifluorescence Microscopy  
     Transmission Electron Microscopy (TEM)  
 Nuclear Magnetic Resonance (NMR)

**Spectrofluorometry**

**Spectrophotometry**

**Total Organic Carbon (TOC) Analysis**

**Ultramicrotomy**

**UV-Vis Spectroscopy**

**Specialized Environmental Datalogging and Analytical Instruments**

Bbe Fluoroprobe

Bbe AlgaeTorch

Bottom Dredge Sediment Samplers

Campbell Dataloggers: 1000 Series and CR6 Series

CTD Profiler

Gravity Sediment Corers

Imaging FlowCytoBot

Nephelometers

Phyto-PAM-II

PurpleAir Air Quality Sensors

Roseate Bottles

SUNA Nitrate Sensor

Tisch Environmental High Volume Aerosol Impactors

Turner Designs C6P Submersible Fluorometer

YSI Water Quality Sondes (6600 series and EXO series)