

DR. RACHEL M. PILLA, PhD

Aquatic Ecologist, Biodiversity & Ecosystem Health Group

Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830

pillarm1@ornl.gov ▪ <https://www.ornl.gov/staff-profile/rachel-m-pilla> ▪ Twitter: @rmpilla**EDUCATION**

-
- Ph.D.**, Ecology, Evolution, and Environmental Biology, Miami University, Oxford, Ohio **2021**
- with Certification in Applied Statistics
 - semester internship at Université Laval, Québec, Canada (2019)
 - Dissertation: “Lake Vertical Ecosystem Responses to Climate and Environmental Changes: Integrating Comparative Time Series, Modeling, and High-Frequency Approaches”
- M.S.**, Biology, Miami University, Oxford, Ohio **2015**
- Thesis: “Lake Temperatures as Sentinel Responses to Climate Change”
- B.S.**, Environmental Sciences, University of Notre Dame, Notre Dame, Indiana **2013**
- with Minor in Anthropology
 - semester study abroad in Rome, Italy, at John Cabot University (2011)

APPOINTMENTS & RESEARCH EXPERIENCE

-
- 2024-present **Aquatic Ecologist**, Oak Ridge National Laboratory, Oak Ridge, Tennessee
- Lead quantification of GHG concentrations and emissions from hydropower reservoirs, and develop novel autonomous surface drone and sensor technologies
 - Analyze carbon dynamics and ecological changes in aquatic ecosystems using advanced time series analyses, modelling, and experimental methods
- 2021-2024 **Postdoctoral Research Associate**, Oak Ridge National Laboratory, Oak Ridge, Tennessee (advisor: Dr. Natalie Griffiths)
- Organize field campaigns and lead analyses of GHG concentrations and emissions from hydropower reservoirs, and develop novel autonomous surface drone and sensor technologies
 - Derive carbon spiraling and ecosystem function metrics and conduct data analysis on long-term Walker Branch stream and watershed hydrological, physiochemical, biological, and climate data in conjunction with NEON data
- 2013-2021 **Graduate Student Researcher**, Miami University, Oxford, Ohio (advisor: Dr. Craig Williamson)
- Led research to analyze long-term and seasonal changes in lake ecosystems resultant from changes in water transparency using high-frequency data, modelling, and experimental techniques
- 2015-2016 **Research Associate**, Center for Aquatic and Watershed Science, Miami University, Oxford, Ohio
- Conducted research on long-term changes in lake vertical thermal structure from a global dataset of over 100 lakes
 - Developed and instructed R workshops at Miami University, Lacawac Sanctuary & Biological Field Station, and Northeast Global Lake Ecological Observatory Network Regional Conferences
- 2013 **Research Associate**, National Science Foundation Integrated Graduate Education and Research Traineeship, Lacawac Sanctuary & Biological Field Station, Lake Ariel, Pennsylvania
- Led analysis of thermal trends in three intensively studied lakes, supplemented by field experiments to understand the survival and predation of zooplankton to different temperature and light conditions
 - Collected bi-monthly field samples as part of an ongoing long-term lake database (> 30 years) across three lakes in the region using standard sampling methods and advanced automated profiling techniques
- 2011-2013 **Undergraduate Student Researcher**, Department of Biological Sciences, University of Notre Dame, South Bend, Indiana (advisor: Dr. Stuart Jones)
- Collected a variety of field samples from one intensively studied lake and a nine-lake survey, including weather data, lake profiles, water chemistry, chlorophyll and organic carbon samples, and zooplankton samples at the University of Notre Dame Environmental Research Center
 - Designed and led an in-situ mesocosm experiment to understand the effects of food web structure and nutrient supply on methane release from lakes, including collecting and analyzing data on methane concentration, flux, and production; zooplankton abundance; water quality and chemistry; methane oxidizing bacteria abundance; and sediment organic matter

PUBLICATIONS

PEER-REVIEWED:

- 31) Meyer, M. F., S. N. Topp, T. V. King, R. Ladwig, **R. M. Pilla**, H. A. Dugan, J. R. Eggleston, S. E. Hampton, D. M. Leech, I. A. Oleksy, J. C. Ross, M. R. V. Ross, R. I. Woolway, X. Yang, M. R. Brousil, K. C. Fickas, J. C. Padowski, A. I. Pollard, J. Ren, and J. A. Zwart. (2024). National-scale, remotely sensed lake trophic state 1984-2020. *Scientific Data*, doi: 10.1038/s41597-024-02921-0
- 30) Jager, H. I., **R. M. Pilla**, C. H. Hansen, P. G. Matson, B. Iftikhar, N. A. Griffiths. (2023). Understanding how reservoir operations influence methane emissions: a conceptual model. *Water*, doi: 10.3390/w15234112
- 29) A. S. L. Lewis, M. P. Lau, S. F. Jane, K. C. Rose, Y. Be'eri-Shlevin, S. H. Burnet, F. Clayer, H. Feuchtmayr, H.-P. Grossart, D. W. Howard, H. Mariash, J. D. Martin, R. L. North, I. Oleksy, **R. M. Pilla**, A. P. Smagula, R. Sommaruga, S. E. Steiner, P. Verburg, D. Wain, G. A. Weyhenmeyer, and C. C. Carey. (2023). "Anoxia Begets Anoxia: a positive feedback to the deoxygenation of temperate lakes." *Global Change Biology*, doi: 10.1111/gcb.17046
- 28) **Pilla, R. M.**, C. E. Williamson, E. P. Overholt, K. C. Rose, S. A. Berger, R.-M. Couture, H. A. de Wit, I. Granados, H.-P. F. Grossart, G. B. Kirillin, A. Laas, J. C. Nejtgaard, J. A. Rusak, M. W. Swinton, M. Toro, and H. Yao. (2024). Deepwater dissolved oxygen shows little ecological memory between lake phenological seasons. *Inland Waters*, doi: 10.1080/20442041.2023.2265802
- 27) **Pilla, R. M.** and N. A. Griffiths. (2023). Integrating reservoirs into the dissolved organic matter versus primary production paradigm: How does chlorophyll-a change across dissolved organic carbon concentrations in reservoirs? *Ecosystems*, doi:10.1007/s10021-023-00878-6
- 26) M. F. Meyer, M. E. Harlan, R. T. Hensley, Q. Zhan, N. S. Börekçi, T. Bucak, A. N. Cramer, J. Feldbauer, R. Ladwig, J. P. Mesman, I. A. Oleksy, **R. M. Pilla**, J. A. Zwart, E. Calamita, N. J. Gubbins, M. E. Lofton, D. A. Maciel, N. S. Marzolf, F. Olsson, A. N. Thellman, R. Q. Thomas, M. J. Vlah. (2023). Hacking Limnology Workshops and DSOS23: Growing a workforce for the nexus of data science, open science, and the aquatic sciences. *Limnology & Oceanography: Bulletin*
- 25) Efroymsen, R. A., M. J. Peterson, R. T. Jett, E. T. Carter, N. A. Griffiths, A. M. Fortner, C. R. Derolph, P. Ku, P. G. Matson, **R. M. Pilla**. (2023). Remedial effectiveness of a pond biomanipulation: habitat value and concentrations of polychlorinated biphenyls in fish. *Journal of Hazardous Materials*, doi:10.1016/j.jhazmat.2023.132587
- 24) **Pilla, R. M.** and C. E. Williamson. (2023). Multidecadal trends in ultraviolet radiation, temperature, and dissolved oxygen have altered vertical habitat availability for *Daphnia* in temperate Lake Giles, USA. *Freshwater Biology*, doi:10.1111/fwb.14044
- 23) Hansen, C., B. Skinner, **R. M. Pilla**, P. Matson. (2022). Extreme variability in modeled reservoir GHG emissions: how US hydropower compares against global estimates. *Environmental Research Communications*, doi:10.1088/2515-7620/aca24
- 22) Saros, J. E., C. D. Arp, F. Bouchard, J. Comte, R.-M. Couture, J. F. Dean, M. Lafrenière, S. MacIntyre, S. McGowan, M. Rautio, C. Prater, S. E. Tank, M. Walvoord, K. P. Wickland, D. Antoniadis, P. Ayala-Borda, J. Canario, T. W. Drake, D. Folhas, V. Hazuková, H. Kivilä, Y. Klanten, S. Lamoureux, I. Laurion, **R. M. Pilla**, J. E. Vonk, S. Zolkos, W. F. Vincent. (2022). Sentinel responses of Arctic freshwater systems to climate: linkages, evidence, and a roadmap for future research. *Arctic Science* (Special issue: Terrestrial Geosystems, Ecosystems and Human Systems in the Fast-Changing Arctic), doi:10.1139/AS-2022-0021
- 21) Meyer, M. F., C. C. Barbosa, R. Ladwig, J. P. Mesman, N. S. Börekçi, K. Cawley, J. Feldbauer, I. A. Oleksy, **R. M. Pilla**, P. Q. Tran, J. A. Zwart, N. A. Schnedler-Meyer, T. K. Andersen, M. R. Brousil, K. C. Fickas, A. Filazzola, T. V. King, N. Sánchez-López, V. Stengel, D. Trolle. (2022). Hacking Limnology Workshop and DSOS22: Creating a Community of Practice for the Nexus of Data Science, Open Science, and the Aquatic Sciences. *Limnology & Oceanography Bulletin*, doi:10.1002/lob.10525
- 20) **Pilla, R. M.**, N. A. Griffiths, L. Gu, S.-C. Kao, R. McManamay, D. M. Ricciuto, and X. Shi. (2022). Effects of anthropogenically driven environmental, climate, and land-use change on inland water carbon dynamics: What have we learned and where are we going? *Global Change Biology*, doi:10.1111/gcb.16324
- 19) Jager, H. I., N. A. Griffiths, C. Hansen, A. King, P. Matson, D. Singh, **R. M. Pilla**, H. Battey. (2022). Getting Lost Tracking the Carbon Footprint of Hydropower. *Renewable and Sustainable Energy Reviews*, doi:10.1016/j.rser.2022.112408
- 18) **Pilla, R. M.** and C. E. Williamson. (2021). Earlier ice breakup induces changepoint responses in duration and variability of spring mixing and summer stratification duration in dimictic lakes. *Limnology & Oceanography* (Special issue: Nonlinear dynamics, resilience, and regime shifts in aquatic communities and ecosystems), doi:10.1002/lno.11888
- 17) Hrycik, A., P. Isles, R. Adrian, M. Albright, L. Bacon, S. Berger, R. Bhattacharya, H. Grossart, J. Hejzlar, A. Hetherington, L. Knoll, A. Laas, C. McDonald, K. Merrell, J. Nejtgaard, K. Nelson, P. Nöges, A. Paterson, **R. M. Pilla**, D. Robertson, L. Rudstam, J. Rusak, S. Sadro, E. Silow, J. Stockwell, H. Yao, K. Yokota, and D. Pierson. (2021). Earlier winter/spring runoff and snowmelt during warmer winters lead to lower summer chlorophyll-a in north temperate lakes. *Global Change Biology*, doi:10.1111/gcb.15797
- 16) Mette, E., E. P. Overholt, D. Nguyen, **R. M. Pilla**, and C. E. Williamson. (2021). How Do Increases in Dissolved Organic Matter

and “Browning” Affect Lake Ecosystems? Using a long-term data set to investigate changes in lake ecology related to reduced water clarity. *Ecological Society of America's EcoEd Digital Library*, <https://ecoed.esa.org/r3044>

- 15) **Pilla, R. M.**, E. M. Mette, C. E. Williamson, B. V. Adamovich, R. Adrian, O. Anneville, E. Balseiro, S. Ban, S. Chandra, W. Colom-Montero, S. P. Devlin, M. A. Dix, M. T. Dokulil, N. A. Feldsine, H. Feuchtmayr, N. K. Fogarty, E. E. Gaiser, S. F. Girdner, M. J. González, K. D. Hambright, D. P. Hamilton, K. Havens, D. O. Hessen, H. Hetzenauer, S. N. Higgins, T. H. Huttula, H. Huuskonen, P. D. Isles, K. D. Joehnk, W. B. Keller, J. Klug, L. B. Knoll, J. Korhonen, N. M. Korovchinsky, O. Köster, B. M. Kraemer, P. R. Leavitt, B. Leoni, F. Lepori, E. V. Lepskaya, N. R. Lottig, M. S. Luger, S. C. Maberly, S. MacIntyre, C. McBride, P. McIntyre, S. J. Melles, B. Modenutti, D. Müller-Navarra, L. Pacholski, A. M. Paterson, D. C. Pierson, H. V. Pislegina, P. Plisnier, D. C. Richardson, A. Rimmer, M. Rogora, D. Y. Rogozin, J. A. Rusak, O. O. Rusanovskaya, S. Sadro, N. Salmaso, J. E. Saros, J. Sarvala, É. Saulnier-Talbot, D. E. Schindler, S. V. Shimaraeva, E. A. Silow, L. M. Sitoki, R. Sommaruga, D. Straile, K.E. Strock, H. Swain, J.M. Tallant, W. Thiery, M.A. Timofeyev, A.P. Tolomeev, K. Tominaga, M.J. Vanni, P. Verburg, R.D. Vinebrooke, J. Wanzenböck, K. Weathers, G. A. Weyhenmeyer, E. S. Zadereev, and T. V. Zhukova. (2021). Global data set of long-term summertime vertical temperature profiles in 153 lakes. *Scientific Data*, doi:10.1038/s41597-021-00983-y
- 14) Moore, T. N., J. Mesman, R. Ladwig, J. Feldbauer, F. Olsson, **R. M. Pilla**, T. Shatwell, J. Venkiteswaran, A. Delany, H. Dugan, K. C. Rose, and J. Read. (2021). LakeEnsemblR: An R package that facilitates ensemble modelling of lakes. *Environmental Modelling & Software*, doi:10.1016/j.envsoft.2021.105101
- 13) Jane, S. F., G. J. A. Hansen, B. M. Kraemer, P. R. Leavitt, J. L. Mincer, R. L. North, **R. M. Pilla**, J. T. Stetler, C. E. Williamson, R. I. Woolway, L. Arvola, S. Chandra, C. L. DeGasperi, L. Diemer, J. Dunalska, O. Erina, G. Flaim, H. P. Grossart, K. D. Hambright, C. Hein, J. Hejzlar, L. L. Janus, J. P. Jenny, J. R. Jones, L. B. Knoll, B. Leoni, E. Mackay, S. I. S. Matsuzaki, C. McBride, D. C. Müller-Navarra, A. M. Paterson, D. Pierson, M. Rogora, J. A. Rusak, S. Sadro, E. Saulnier-Talbot, M. Schmid, R. Sommaruga, W. Thiery, P. Verburg, K. C. Weathers, G. A. Weyhenmeyer, K. Yokota, and K. C. Rose. (2021). Widespread deoxygenation of temperate lakes. *Nature*, doi:10.1038/s41586-021-03550-y
- 12) Kraemer, B., **R. M. Pilla**, R. Woolway, O. Anneville, S. Ban, W. Colom, S. Devlin, M. Dokulil, E. Gaiser, K. Hambright, D. Hessen, S. Higgins, K. Jöhnk, W. Keller, L. Knoll, P. Leavitt, F. Lepori, M. Luger, S. Maberly, D. Müller-Navarra, A. Paterson, D. Pierson, D. Richardson, M. Rogora, J. Rusak, S. Sadro, N. Salmaso, M. Schmid, E. Silow, R. Sommaruga, J. Stelzer, D. Straile, W. Thiery, P. Verburg, G. Weyhenmeyer, and R. Adrian. (2021). Climate change drives widespread shifts in lake thermal habitat. *Nature Climate Change*, doi:10.1038/s41558-021-01060-3
- 11) **Pilla, R. M.** (2021). Lake Vertical Ecosystem Responses to Climate and Environmental Changes: Integrating Comparative Time Series, Modeling, and High-Frequency Approaches. Electronic Thesis or Dissertation. Miami University, *OhioLINK*. http://rave.ohiolink.edu/etdc/view?acc_num=miami1620646716185966
- 10) **Pilla, R. M.** and R. M. Couture. (2021). Modelling the response of photosynthetically active and ultraviolet light attenuation to changing dissolved organic carbon in the water column of browning lakes. *Limnology & Oceanography*, doi:10.1002/lno.11753
- 9) **Pilla, R. M.**, C. E. Williamson, B. V. Adamovich, R. Adrian, O. Anneville, S. Chandra, W. Colom-Montero, S. P. Devlin, M. A. Dix, M. T. Dokulil, E. E. Gaiser, S. F. Girdner, K. D. Hambright, D. P. Hamilton, K. Havens, D. O. Hessen, S. N. Higgins, T. H. Huttula, H. Huuskonen, P. D. F. Isles, K. D. Joehnk, I. D. Jones, W. B. Keller, L. B. Knoll, J. Korhonen, B. M. Kraemer, P. R. Leavitt, F. Lepori, M. S. Luger, S. C. Maberly, J. M. Melack, S. J. Melles, D. C. Müller-Navarra, D. C. Pierson, H. V. Pislegina, P. D. Plisnier, D. C. Richardson, A. Rimmer, M. Rogora, J. A. Rusak, S. Sadro, N. Salmaso, J. E. Saros, É. Saulnier-Talbot, D. E. Schindler, M. Schmid, S. V. Shimaraeva, E. A. Silow, L. M. Sitoki, R. Sommaruga, D. Straile, K. E. Strock, W. Thiery, M. A. Timofeyev, P. Verburg, R. D. Vinebrooke, G. A. Weyhenmeyer, and E. Zadereev. (2020). Deeper waters are changing less consistently than surface waters in a global analysis of 102 lakes. *Scientific Reports*, doi:10.1038/s41598-020-76873-x
- 8) Yang, B., M. G. Wells, B. C. McMeans, H. A. Dugan, J.A. Rusak, G. A. Weyhenmeyer, J. A. Brentrup, A. R. Hrycik, A. Laas, **R. M. Pilla**, J. A. Austin, P. J. Blanchfield, C. C. Carey, M. M. Guzzo, N. R. Lottig, M. D. Mackay, T. A. Middell, D. C. Pierson, J. Wang, J. D. Young. (2020). A New Thermal Categorization of Ice-covered Lakes. *Geophysical Research Letters*, doi:10.1029/2020GL091374
- 7) Williamson, C. E., E. P. Overholt, **R. M. Pilla**, and K. W. Wilkins. (2020). Habitat-mediated responses of zooplankton to decreasing light in two temperate lakes undergoing long-term browning. *Frontiers in Environmental Science*, doi:10.3389/fenvs.2020.00073
- 6) **Pilla, R. M.**, C. E. Williamson, J. Zhang, R. Smyth, J. D. Lenters, J. A. Brentrup, L. B. Knoll, and T. J. Fisher. (2018). Browning-related decreases in water transparency lead to long-term increases in surface water temperature and thermal stratification in two small lakes. *Journal of Geophysical Research: Biogeosciences* 123, doi: 10.1029/2017JG004321
→ Selected for an EOS Research Spotlight by the editorial board of the American Geophysical Union (<https://eos.org/research-spotlights/dark-and-stormy-how-more-rainfall-leads-to-warm-and-murky-lakes>), and highlighted by Miami University Campus News (<http://miamioh.edu/news/campus-news/2018/06/rachel-pilla-eos-research-spotlight.html>)
- 5) Knoll, L. B., C. E. Williamson, **R. M. Pilla**, T. H. Leach, J. A. Brentrup, and T. J. Fisher. (2018). Browning-related oxygen depletion in an oligotrophic lake. *Inland Waters*, doi: 10.1080/20442041.2018.1452355

- 4) Richardson, D. C., S. J. Melles, **R. M. Pilla**, A. L. Hetherington, L. B. Knoll, C. E. Williamson, B. M. Kraemer, J. R. Jackson, E. C. Long, K. Moore, L.G. Rudstam, J. A. Rusak, J. E. Saros, S. Sharma, K. E. Strock, K. C. Weathers, and C. R. Wigdahl-Perry. (2017). Long-term thermal trends in lakes in Northeastern North America. *Water* 9(6), doi: 10.3390/w9060442
- 3) Williamson, C. E., E. P. Overholt, J. A. Brentrup, **R. M. Pilla**, T. H. Leach, S. G. Schladow, J. D. Warren, S. S. Urmy, S. Sadro, S. Chandra, and P. J. Neale. (2016). Sentinel responses to droughts, wildfires, and floods: effects of UV radiation on lakes and their ecosystem services. *Frontiers in Ecology and the Environment* 14(2): 102-109, doi: 10.1002/fee.1228
- 2) Williamson, C. E., E. P. Overholt, **R. M. Pilla**, T. H. Leach, J. A. Brentrup, L. B. Knoll, E. M. Mette, and R. E. Moeller. (2015). Ecological consequences of long-term browning in lakes. *Scientific Reports* doi: 10.1038/srep18666
- 1) **Pilla, R. M.** (2015). Lake Temperatures as Sentinel Responses to Climate Change. Electronic Thesis or Dissertation. Miami University, *OhioLINK*. http://rave.ohiolink.edu/etdc/view?acc_num=miami1443090263

IN REVIEW:

- Pilla, R. M.**, C. S. Faehndrich, A. M. Fortner, R. T. Jett, M. W. Jones, N. J. Jones, J. R. Phillips, C. H. Hansen, B. Iftikhar, H. I. Jager, P. G. Matson, and N. A. Griffiths. Rates and drivers of carbon emissions from hydropower reservoirs in the southeastern United States. In revision at *Journal of Geophysical Research: Biogeosciences*
- Farruggia, M. J., J. Brahney, A. J. Tanentzap, J. A. Brentrup, L. S. Brighenti, S. Chandra, A. Cortés, R. L. Fernandez, J. M. Fischer, A. L. Forrest, Y. Jin, K. Larrieu, I. M. McCullough, I. A. Oleksy, **R. M. Pilla**, J. A. Rusak, F. Scordo, A. P. Smits, C. C. Symons, M. Tang, S. G. Woodman, and S. Sadro. Wildfire smoke impacts lake ecosystems. In review at *Global Change Biology*

DATA, SOFTWARE, & VISUAL PUBLICATIONS:

- Meyer, M. F., S. N. Topp, T. V. King, R. Ladwig, **R. M. Pilla**, H. A. Dugan, J. R. Eggleston, S. E. Hampton, D. M. Leech, I. A. Oleksy, J. C. Ross, M. R. Ross, R. I. Woolway, X. Yang, M. R. Brousil, K. C. Fickas, J. C. Padowski, A. I. Pollard, J. Ren, and J. A. Zwart. (2023). National-scale, remotely sensed lake trophic state (LTS-US) 1984-2020. *Environmental Data Initiative*. <https://doi.org/10.6073/pasta/212a3172ac36e8dc6e1862f9c2522fa4>
- Meyer, M., R. Ladwig, I. Oleksy, J. Mesman, J. Zwart, A. N. Cramer, K. Cawley, J. Feldbauer, P. Tran, G. Lopez Moreira, M. Shikhani, D. Gurung, R. Hensley, E. Matta, R. P. McClure, T. Petzoldt, N. Sanchez Lopez, K. Soetaert, M. K. Thomas, S. Topp, Y. Xiao, E. McDaniel, L. Schaerer, S. Mezzini, C. Varadharajan, G. Simpson, J. Hollister, E. J. Pedersen, M. Ross, C. Gries, A. Husic, M. Beck, M. Scheuerell, C. Williams, D. Kincaid, **R. M. Pilla**, A. Shuvo, L. Koenig, S. Collins, J. R. Cavalcanti, M. Sonnewald, K. Hondula, C. Nell, C. Erdmann, J. Stachelek, S. M. Saia, P. Hanly, J. Adam, A. Pollard, S. Chen, and C. C. Barbosa (2023). AEMON-JDSOS Archive: “Hacking Limnology” Workshop + Virtual Summit in Data Science & Open Science in Aquatic Research. *Open Science Framework (OSF)*. <https://osf.io/682v5/>
- Pilla, R. M.**, E. M. Mette, C. E. Williamson, B. V. Adamovich, R. Adrian, O. Anneville, E. Balseiro, S. Ban, S. Chandra, W. Colom-Montero, S. P. Devlin, M. A. Dix, M. T. Dokulil, N. A. Feldsine, H. Feuchtmayr, N. K. Fogarty, E. E. Gaiser, S. F. Girdner, M. J. González, K. D. Hambright, D. P. Hamilton, K. Havens, D. O. Hessen, H. Hetzenauer, S. N. Higgins, T. H. Huttula, H. Huuskonen, P. D. Isles, K. D. Joehnk, W. B. Keller, J. Klug, L. B. Knoll, J. Korhonen, N. M. Korovchinsky, O. Köster, B. M. Kraemer, P. R. Leavitt, B. Leoni, F. Lepori, E. V. Lepskaya, N. R. Lottig, M. S. Luger, S. C. Maberly, S. MacIntyre, C. McBride, P. MacIntyre, S. J. Melles, B. Modenutti, D. Müller-Navarra, L. Pacholski, A. M. Paterson, D. C. Pierson, H. V. Pislegina, P. Plisnier, D. C. Richardson, A. Rimmer, M. Rogora, D. Y. Rogozin, J. A. Rusak, O. O. Rusanovskaya, S. Sadro, N. Salmaso, J. E. Saros, J. Sarvala, É. Saulnier-Talbot, D. E. Schindler, S. V. Shimaraeva, E. A. Silow, L. M. Sitoki, R. Sommaruga, D. Straile, K.E. Strock, H. Swain, J.M. Tallant, W. Thiery, M.A. Timofeyev, A.P. Tolomeev, K. Tominaga, M.J. Vanni, P. Verburg, R.D. Vinebrooke, J. Wanzenböck, K. Weathers, G. A. Weyhenmeyer, E. S. Zadereev, and T. V. Zhukova. (2021). Global data set of long-term summertime vertical temperature profiles in 153 lakes. *Environmental Data Initiative*. <https://portal.edirepository.org/nis/mapbrowse?scope=edi&identifier=705>
- Pilla, R. M.** and O. Anneville. (2020). Time series dataset of water temperature profiles during stable summer stratification in Lakes Annecy, Bourget and Geneva. *Portail Data INRAE*, V1, doi:10.15454/YOLA0Y
- Moore, T., J. Mesman, R. Ladwig, J. Feldbauer, J. S. Read, **R. M. Pilla**, and others. (2020). Run ensemble of lake models in R: Package LakeEnsemblR. Version 1.0.0, <https://github.com/aemon-j/LakeEnsemblR>
- Overholt, E. P., Nguyen, D., **Pilla, R. M.**, and Mette, E. M. (2020). Long-Term Changes in Pocono Lakes. R Shiny App, <http://dataviz.miamioh.edu>
- Jane, S. F., G. J. Hansen, K. Benjamin, P. R. Leavitt, J. L. Mincer, R. L. North, **R. M. Pilla**, J. T. Stetler, C. E. Williamson, R. Woolway, L. Arvola, S. Chandra, C. L. DeGasperi, L. Diemer, J. Dunalska, O. Erina, G. Flaim, H. Grossart, K. Hambright, C. Hein, J. Hejzlar, L.L. Janus, J. Jenny, J.R. Jones, L.B. Knoll, B. Leoni, E. Mackay, S.S. Matsuzaki, C. McBride, D.C. Mueller-Navarra, A. M. Paterson, D. Pierson, M. Rogora, J. A. Rusak, S. Sadro, E. Saulnier-Talbot, M. Schmid, R. Sommaruga, W. Thiery, P. Verburg, K. C. Weathers, G. A. Weyhenmeyer, K. Yokota, and K. C. Rose. (2020). Widespread deoxygenation of

temperate lakes: companion dataset 1980 – 2017. *Environmental Data Initiative*.

<https://doi.org/10.6073/pasta/ac8b05bb0da19032b3df3efc21f83874>

Pilla, R. M. (2020). “Dark Waters: Structural Changes to Lake Ecosystems due to Browning.” *LakeLine* publication by the North American Lake Management Society

RESEARCH GRANTS & AWARDS

- 2024-2025 ▪ Co-PI of NSF Environmental Data Science Innovation & Inclusion Lab proposal for Synthesizing Patterns and Drivers of Zooplankton Community Dynamics Worldwide (\$65,000)
- 2023 ▪ Outstanding Post-Graduate Researcher Award in Environmental Science Division at Oak Ridge National Laboratory, for developing and applying cutting-edge empirical and modeling techniques to advance the understanding of greenhouse gas emissions from hydropower reservoirs
- 2022-2025 ▪ Co-PI of USGS John Wesley Powell Center for Analysis and Synthesis proposal for Synthesizing patterns and drivers of changes in lake zooplankton community dynamics worldwide (\$182,809)
- 2023-2024 ▪ Co-investigator for Centre for the Synthesis and Analysis of Biodiversity proposal entitled “Linking environmental drivers with lake zooplankton biodiversity dynamics to inform trait-based predictions of lake ecosystem function” (€15,000)
- 2022 ▪ “People’s Choice Award” for best oral presentation in Energy & Environment session at Oak Ridge Postdoctoral Association Research Symposium
- 2021 ▪ Sentinel North Authors’ Fund, Université Laval, Québec, Canada (\$908)
- 2020-2021 ▪ Opportunities for Promoting Understanding through Synthesis NSF research grant (2 semester Research Assistantship, est. \$33,347)
- 2020 ▪ General Endowment Award from Society for Freshwater Science (\$1,000)
- 2019 ▪ Top poster presentation award at 2019 Graduate Research Forum from the Graduate School at Miami University (\$300)
- Cary Institute of Ecosystems Studies student travel award for 21st Global Lake Ecological Observatory Network All-Hands Meeting, Muskoka, Ontario, Canada (\$1,806)
- Travel scholarship from Rensselaer Polytechnic Institute for Sentinel North 2019 Scientific Meeting, Lévis, Québec, Canada (\$1,087)
- Sentinel North Internship Scholarship Program for Foreign Students, Université Laval, Québec, Canada (\$2,200)
- 2018-2020 ▪ Long-Term Research in Environmental Biology NSF research grant (3 summers of funding, est. \$5,280)
- 2018-2019 ▪ Committee on Faculty Research from Miami University (2 semester Research Assistantship, est. \$20,000)
- 2018 ▪ Precision Measurement Engineering, Inc. MiniDOT Award for Graduate Students (1 PME MiniDOT sensor, est. \$1,000)
- Graduate Student Achievement Fund from Graduate School & Alumni and Friends of the University, Miami University (\$100)
- Miami University Undergraduate Summer Scholar 2018 award to Doan Nguyen (served as graduate student mentor) (\$3,000)
- North American Lake Management Society (NALMS) collegiate scholarship for student travel for NALMS 2018 Symposium, Cincinnati, Ohio (\$285)
- Ohio Lake Management Society student travel award for travel to NALMS 2018 Symposium, Cincinnati, Ohio (\$400)
- Cary Institute of Ecosystems Studies student travel award for 20th Global Lake Ecological Observatory Network All-Hands Meeting, Rottneest Island, Australia (\$1,500)
- Miami University Department of Biology Graduate Student Enrichment & Student Publication Award to attend 20th Global Lake Ecological Observatory Network All-Hands Meeting, Rottneest Island, Australia (\$1,400)
- 2017 ▪ Robert Estabrook Moeller Research Fellow Award from Lacawac Sanctuary & Biological Field Station (\$2,000)
- Doctoral-Undergraduate Opportunity Scholarship from Miami University, with undergraduate Doan Nguyen (\$1,000)
- Cary Institute of Ecosystems Studies award for travel to 19th Global Lake Ecological Observatory Network All-Hands Meeting, New Paltz, New York (\$1,380)
- Miami University Center for Analytics and Data Science Summer Research Fellowship (\$4,000)
- 2015 ▪ Miami University Department of Biology Graduate Student Enrichment Award attend 58th Annual International

- Association for Great Lakes Research Conference, Burlington, Vermont (\$375)
- 2014
- National Science Foundation Science Across Virtual Institutes (SAVI) award for travel to 16th Global Lake Ecological Observatory Network All-Hands Meeting, Jouvence, Canada (\$1,000)
 - Miami University Department of Biology Graduate Student Enrichment Award to attend Joint Aquatics Sciences Meeting, Portland, Oregon (\$625)
- 2012
- University of Notre Dame College of Science Summer Undergraduate Research Fellowship (\$4,500)
- 2009-2013
- Notre Dame Club of Saint Louis Scholarship (\$20,000)

TEACHING EXPERIENCE

COURSES INSTRUCTED:

Miami University:

- 2020
- Introduction to R two-day workshop for the Computer Science in Modern Biology Student Advancement Workshop, supported by Stem Inclusion Council at the University of Oklahoma and M.I.A.M.I. WOMEN Giving Circle
 - Data Visualization in R two-day workshop for the Computer Science in Modern Biology Student Advancement Workshop, supported by Stem Inclusion Council at the University of Oklahoma and M.I.A.M.I. WOMEN Giving Circle
- 2019-2020
- BIO 104: Developing Skills and Approaches for Science Success
- 2018
- BIO 491/710: All Things for Ecological Data
- 2016
- R Workshop: Introduction to R for Limnological Analyses workshop for the Global Change Limnology Laboratory

Limpopo Resilience Lab, in collaboration with University of Venda (Thohoyandou, South Africa), Duquesne University (Pennsylvania, USA), and Rensselaer Polytechnic Institute (New York, USA):

- 2021
- Five-day workshop covering introduction to R, data management and visualization, basic statistics, and pedagogy in R, for students, faculty, government scientists, and stakeholders in the Limpopo River Basin, South Africa, supported by United States Agency for International Development (US AID), Southern Africa Regional Mission

Lacawac Sanctuary & Biological Field Station:

- 2015-2020
- R Statistics Essentials Training Workshop at Lacawac Sanctuary & Biological Field Station

Cary Institute of Ecosystem Studies:

- 2016-2017
- R Workshop: Introduction to R & Basics for Limnology at Northeast Global Lake Ecological Observatory Network Regional Conferences

TEACHING ASSISTANT:

Miami University:

- 2016-2017
- BIO 463/563 Limnology Lecture and Laboratory
- 2013-2018
- BIO 116: Biological Concepts: Structure, Function, Cellular, and Molecular Biology Laboratory
- 2013-2015
- BIO 115: Biological Concepts: Ecology, Evolution, Genetics, and Diversity Laboratory

University of Notre Dame:

- 2012
- BIOS 40411: Biostatistics

STUDENT MENTORSHIP

- 2023-2024
- Anna Cardall (Department of Energy SULI and ECO internships at Oak Ridge National Laboratory)
- 2023
- DeMarcus Turner (GEM Fellowship at Oak Ridge National Laboratory)

- 2022 ■ Chloe Faehndrich (Department of Energy Science Undergraduate Laboratory Internship at Oak Ridge National Laboratory), *understanding carbon emissions and sink-source dynamics in hydropower reservoirs*
 → **Presented research at DOE WDTS “IGNITE Off!” Competition**
 → **Presented research at Oak Ridge National Laboratory Summer Intern Symposium**
 → **Presented research at the Global Lake Ecological Observatory Network all-hands meeting in 2022**
- 2020-2022 ■ Alyssa Cassidy, *remote monitoring of ice cover in three Pennsylvania lakes*
 → **Presented research at Miami University Undergraduate Research Forum in 2021: “Shorter periods of ice cover in lakes reduce critically low oxygen levels, which can influence lake ecology”**
- 2016-2020 ■ Doan Nguyen: *high-frequency data analytics and development of R Shiny application*
 → **Awarded Doctoral-Undergraduate Opportunity Scholarship from Miami University in 2017**
 → **Awarded Undergraduate Summer Scholarship from Miami University in 2018**
 → **Awarded Grace Hopper Celebration Scholarship Grant in 2018**
 → **Awarded Watres Student Research Award from Lacawac Sanctuary & Biological Field Station in 2020**
- 2014-2015 ■ Teresa Warner, *analysis of long-term trends in dissolved oxygen in two Pennsylvania lakes*

CONFERENCE PRESENTATIONS & SEMINARS (presenting author only)

- 2024 ■ patterns and drivers of carbon emissions versus sequestration in six hydropower reservoirs in the southeastern United States (Jun. 2024, **upcoming**). Association for the Sciences of Limnology and Oceanography 2024 Aquatic Sciences Meeting, Madison, Wisconsin
- Shifts in carbon emissions versus sequestration from hydropower reservoirs (Apr. 2024, **upcoming**). Global Lake Ecological Observatory Network 2024 Virtual Meeting
 - Understanding Uncertainty in Greenhouse Gas Emissions from Hydropower Reservoirs (Feb. 2024, **invited seminar**). Université du Québec à Montréal, Montréal, Québec, Canada
 - Contributions of hydropower reservoirs to global carbon emissions: breaking down sources of uncertainties (Jan. 2024). 11th BIOGEOMON International Symposium on Ecosystem Behavior, San Juan, Puerto Rico
- 2023 ■ Biogeochemical & Upscaling Impacts of Sub-annual Changes in Water Quantity on Greenhouse Gas Emissions from Reservoirs (Jun. 2023). Association for the Sciences of Limnology and Oceanography 2023 Aquatic Sciences Meeting, Palma de Mallorca, Spain
- Seasonal patterns in reservoir greenhouse gas emissions and the influence of changing pool elevation (Feb. 2023). Global Lake Ecological Observatory Network 2023 Virtual All-Hands Meeting
- 2022 ■ Trends and Drivers of Greenhouse Gas Fluxes from Hydropower Reservoirs in the Southeastern US (Dec. 2022). American Geophysical Union Fall Meeting, Chicago, Illinois
- The Role of Carbon in Freshwater Ecosystems: Influences on Water Clarity to Greenhouse Gas Emissions (Nov. 2022, **invited seminar**). Bowling Green State University, Bowling Green, Ohio
 - How have carbon emissions from hydropower reservoirs changed over 10 years? (July 2022). 10th Annual Oak Ridge Postdoctoral Association Research Symposium, Oak Ridge, Tennessee
 → **Awarded “People’s Choice Award” for best presentation in Energy & Environment session**
 - Greenhouse Gas Emissions from Hydropower Reservoirs: How Have Fluxes Changed Over Ten Years? (May 2022). Joint Aquatic Sciences Meeting, Grand Rapids, Michigan
 - The role of freshwater ecosystems in the global carbon cycle (Feb. 2022, **invited seminar**). Department of Energy Science Undergraduate Laboratory Internships (SULI) seminar series, Oak Ridge National Laboratory, Oak Ridge, Tennessee
- 2021 ■ Predicting Student Success in Introductory Biology: Does grit, student identity, or enrollment in a supplementary instruction course matter? (Nov. 2021). 40th Annual Original Lilly Conference on College Teaching, Miami University, Oxford, Ohio
- Design of an Autonomous Surface Vehicle for High-Resolution Spatial Measurements of Greenhouse Gases in Reservoirs (Oct. 2021). Global Lake Ecological Observatory Network 2021 Virtual All-Hands Meeting, virtual due to COVID-19
 - Building a Global Data Set of Long-Term Summertime Vertical Temperature Profiles (Jul. 2021). Incorporating Data Science and Open Science in Aquatic Research Virtual Summit
 - Advancing models to link changes in dissolved organic carbon with PAR and UV light attenuation and the ecosystem responses in browning lakes (Mar. 2021). Arctic Sciences Summit, virtual due to COVID-19

- 2020 ▪ How Does Changing Water Clarity in Lakes Alter Aquatic Habitat Availability? (Nov. 2020). 12th Annual Graduate Research Forum, Miami University, Oxford, Ohio
- Year-Round High-Frequency Data Highlight Different Drivers of Oxygen Depletion in Winter vs. Summer. (Oct. 2020). Global Lake Ecological Observatory Network 21.5 Virtual All-Hands Meeting, virtual due to COVID-19
 - Understanding Seasonal & Long-Term Structural Changes in Lakes, and Implications for Aquatic Habitat Availability. (Oct. 2020, *seminar*). Miami University Department of Biology, Oxford, Ohio
- 2019 ▪ Oxygen Depletion in Lakes is Influenced by Ice Cover, Morphometry, and Water Quality. (Nov. 2019). 21st Global Lake Ecological Observatory Network All-Hands Meeting, Muskoka, Ontario, Canada
- Oxygen Depletion in Lakes is Influenced by Ice Cover, Morphometry, and Water Quality. (Nov. 2019). 11th Annual Graduate Research Forum, Miami University, Oxford, Ohio
→ **Awarded top poster presentation**
 - Modelling Oxygen Depletion in Lakes Responding to Long-Term Browning. (Aug. 2019). Sentinel North 2019 Scientific Meeting, Lévis, Québec, Canada
 - The Regulatory Role of Water Transparency on Lake Ecosystem Structure & Habitat Availability. (May 2019, *invited seminar*). Institut National de la Recherche Scientifique, Québec City, Québec, Canada
 - Lakes as Sentinels of Climate & Environmental Change: Understanding Structural Responses in Freshwater Ecosystems. (Apr. 2019, *invited seminar*). Center for Northern Studies and Sentinel North Joint Seminar, Université Laval, Québec City, Québec, Canada
- 2018 ▪ Global Trends in Lake Thermal Structure and Underlying Patterns. (Dec. 2018). 20th Global Lake Ecological Observatory Network Meeting, Rottneest Island, Australia
- Using Big Data to Estimate Important Physical Events Occurring in Lakes. (Nov. 2018). 10th Annual Graduate Research Forum, Miami University, Oxford, Ohio
 - Structural Changes to Lake Ecosystems Resulting from Long-Term Browning. (Oct. 2018). 38th International Symposium of the North American Lake Management Society, Cincinnati, Ohio
→ **Awarded Jody Connor Student Award Honorable Mention for presenting an outstanding student paper**
- 2017 ▪ Global Trends in Lake Thermal Structure. (Nov. 2017). 19th Global Lake Ecological Observatory Network Meeting, New Paltz, New York
- Lake Ecosystem Responses to Climate and Environmental Change. (Nov. 2017). Graduate Research Forum, Miami University, Oxford, Ohio
 - Science and Research in Ecology and Limnology. (Apr. 2017, *invited guest lecture*) Physical Science for Non-Majors, Miami University, Oxford, Ohio
- 2016 ▪ Long-term Patterns in Global Lake Thermal Structure. (Jul. 2016). 18th Global Lake Ecological Observatory Network and NETLAKE Joint Meeting, Lunz am See & Gaming, Austria
- Real World Science and Research in Ecology and Limnology. (Apr. 2016, *invited guest lecture*). Physical Science for Non-Majors, Miami University, Oxford, Ohio
- 2015 ▪ Lake Temperature Responses to Climate Change: A Global Perspective. (Nov. 2015). Graduate Research Forum, Miami University, Oxford, Ohio
- Lakes as sentinels of climate change: Global lake responses to teleconnections. (May 2015). 58th Annual International Association for Great Lakes Research Conference, University of Vermont, Burlington, Vermont
- 2014 ▪ Lakes as Temperature Sentinels of Climate Change. (Nov. 2014). Graduate Research Forum, Miami University, Oxford, Ohio
- Lakes as temperature sentinels of climate change: expanding to a macro-systems approach. (Oct. 2014). 16th Global Lake Ecological Observatory Network Meeting, Jouvence, Québec, Canada
 - Lakes as temperature sentinels of climate change. (May 2014). Joint Aquatic Sciences Meeting of the Society for Freshwater Science, Association for the Sciences of Limnology and Oceanography, Phycological Society of America, and Society of Wetland Scientists, Portland, Oregon
 - Lakes as temperature sentinels of climate change. (Mar. 2014). Midwest Ecology and Evolution Conference, University of Dayton, Dayton, Ohio
- 2013 ▪ Thermal responses in small lakes to changing climate patterns. (Nov. 2013). Graduate Research Forum, Miami University, Oxford, Ohio
- Drought decreases thermal stratification in small lakes by warming deeper waters. (Jun. 2013). Lacawac Ecological Observatory Workshop, Lacawac Sanctuary & Biological Field Station, Lake Ariel, Pennsylvania

- Effects of food web structure and nutrient supply on methane release in lakes. (Mar. 2013). Midwest Ecology and Evolution Conference, University of Notre Dame, Notre Dame, Indiana
→ *Awarded best undergraduate oral presentation*

OUTREACH, SERVICE, DEJI, & PROFESSIONAL SOCIETIES

- 2024
 - Program committee member for Global Lake Ecological Observatory Network 2024 Virtual Meeting
 - Session co-convener at Association for the Sciences of Limnology and Oceanography's 2024 Aquatic Sciences Meeting ("Advances in estimating greenhouse gas emissions from managed aquatic ecosystems")
 - Session co-convener at Association for the Sciences of Limnology and Oceanography's 2024 Aquatic Sciences Meeting ("The Next Frontier in Aquatic Sciences: Linking remote sensing, data science, modeling, and open science to understand ecosystems' emergent properties")
- 2023
 - Session co-convener at Association for the Sciences of Limnology and Oceanography's 2023 Aquatic Sciences Meeting ("The Next Frontier: Linking remote sensing, data science, modeling, open science, and the aquatic sciences to understand emergent properties of aquatic systems")
- 2022-present
 - Committee member of the Committee for Inclusive Collaboration for the Global Lake Ecological Observatory Network
- 2022-present
 - Organizational team member of the Data Science & Open Science/Aquatic Ecosystem Modelling Network Junior for Early Career Researchers for planning and hosting annual virtual summit and workshop
- 2021-2023
 - Committee member of the Global Lake Ecological Observatory Network's GSA Communications Sub-Committee
- 2021-2023
 - Committee member of the Global Lake Ecological Observatory Network's GSA Poster Sub-Committee
- 2019-2021
 - Graduate Student Member of the Lacawac Science Committee, Lacawac Sanctuary & Biological Field Station, Lake Ariel, Pennsylvania
- 2016-2021
 - Climate Sentinels Working Group leader and moderator for the Global Lake Ecological Observatory Network
- 2020
 - Careers Involving Quantitative Skills for high school women; led workshop session entitled "Counting Crows: Using Big Data to Track Bird Populations" at Miami University, Oxford, Ohio
- 2019-2020
 - Vice President of Biology Graduate Student Association, Miami University, Oxford, Ohio
- 2018-2019
 - "Kids on the Lake" day camp hands-on workshop at Blooming Grove Hunting and Fishing Club, Blooming Grove, Pennsylvania
- 2017-2019
 - Graduate Student Representative of the Faculty Meeting Committee, Miami University, Oxford, Ohio

REVIEWER:

- *Nature Climate Change*
- *Limnology & Oceanography*
- *Limnology & Oceanography Letters*
- *Science of the Total Environment*
- *Inland Waters*
- *Journal of Geophysical Research: Biogeosciences*
- *Environmental Science and Pollution Research*
- *Aquatic Sciences*
- *Scientific Data*
- *National Science Foundation CAREER Proposals*

PROFESSIONAL MEMBERSHIP:

- Association for the Sciences of Limnology & Oceanography (ASLO)
- Global Lake Ecological Observatory Network (GLEON)
- Society for Freshwater Science (SFS)
- Aquatic Ecosystem Modelling Network Junior for Early Career Researchers (AEMON-J)
- Terrestrial Multidisciplinary distributed Observatories for the Study of Arctic Connections (T-MOSAIC)
- International Society of Limnology (SIL)