Lorena Pinheiro-Silva, PhD

RESEARCH ASSITANT SCIENTIST – UNIVERSITY OF MARYLAND CENTER FOR ENVIRONMENTAL STUDIES

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I am a limnologist with a Ph.D. in Ecology, and a strong interest in reservoir ecology, water quality, phytoplankton-zooplankton interface, biodiversity-ecosystem functioning relationship, functional traits, mesocosm experiments, analytical chemistry, habitat monitoring, aquatic ecosystem management and conservation, and programming languages. Next to research, I enjoy teaching and have given graduate-level courses on Statistical Data Analysis in R covering a range of simple and complex applications of R in ecology.

PERSONAL INFORMATION

Professional address
Horn Point Laboratory
2020 Horns Point Road
P.O. Box 775
Cambridge, MD 21613, United States

HIGHER EDUCATION

2016-2021: Doctor of Philosophy (Ph.D.) in Ecology, Universidade Federal de Santa Catarina, Brazil.
Doctoral thesis*: Effects of nutrients and cyanobacteria on diversity, structure, and functioning of plankton communities: an integrated and multidimensional approach of biodiversity.
Supervisory Committee: Dr. Mauricio Mello Petrucio (advisor), Dr. Andros Tarouco Gianuca (co-advisor), Dr. Luc De Meester (sandwich co-advisor, University of Leuven). *The thesis was awarded the 2021 Best Doctoral Dissertation in the Graduate Program in Ecology at UFSC.

2014-2016: Master of Science (M.Sc.) in Biological Science, Universidade Federal do Estado do Rio de Janeiro, Brazil.
Master's Thesis: Effects of water stratification regime on the structure and dynamics of plankton communities in a large Brazilian reservoir. Supervisory Committee: Dr. Christina Wyss Castelo Branco (advisor), Dr. Betina Kozlowsky Suzuki (co-advisor).

2008-2013: Bachelor of Science (Teaching degree) in Biological Sciences, Universidade Federal do Estado do Rio de Janeiro, Brazil.

ACADEMIC POSITIONS

2022-Now: University of Maryland Center for Environmental Studies – UMCES, Cambridge, US
Research Assistant Scientist

- Project: Retrospective Analysis of Anthropogenic Change in Midwest Reservoirs: Integrating Earth Observing Data with Statewide Reservoir Monitoring Programs (NASA-funded project / ROSES-2021).
- Responsibilities include: leverage a large and ongoing water quality monitoring program to evaluate long-term trends and to assess the statistical efficacy and accuracy of remotely sensed products available through a Google Earth Engine pipeline developed for Missouri reservoirs.

2021-2022: Universidade Federal de Santa Catarina – UFSC, Florianópolis, Brazil
Postdoctoral Research Fellow

- Project: The invasion of golden mussel in hydroelectric reservoirs in the upper Uruguay River: effects and mechanisms of biological control.
- Responsibilities include: lead plankton group, conduct plankton and water chemistry analysis, harmonize datasets, perform statistical data analysis, review and write technical reports and scientific manuscripts, and mentor undergrad and grad students.

- Achievements: one research funding from the private sector, lead author and co-author of five papers (in preparation), co-author of a manual for golden mussel sampling in reservoirs, and co-author of an illustrated zooplankton catalogue.

RESEARCH EXPERIENCE

2021-Now: The Global Lake Ecological Observatory Network - GLEON

Project Collaborator / Scientific network memberships

- Project: Zooplankton as Indicator Group - ZIG
- Responsibilities include: create a raw analysis-ready data product from submitted datasets (~228 lakes and 38 countries), provide scripted workflows for each step of data cleaning, and perform high level quality analysis of submitted data.

2021-Now: Universidade Federal de Santa Catarina – UFSC, Florianópolis, Brazil

Project Collaborator

- Project: Effects of wildfires and ash on freshwater biodiversity: ecological assessment using responses of fish, amphibians, zooplankton, and macrophytes to the disorder.
- Responsibilities include: lead the zooplankton group, set up ecological outdoor experiments, review and write scientific manuscripts, mentor undergraduate and graduate students.

2021-2022: Universidade Federal de Santa Catarina – UFSC, Florianópolis, Brazil

Teaching at the undergraduate and graduate levels

- Lectured in two graduate courses (Introduction to Statistics and Statistics applied to Environmental Analysis), guest lecture in three undergraduate courses (Energy Flow and Nutrient Cycling- 2x and Freshwater Ecology) and one graduate course (Scientific Career) and acted as a teaching assistant in two graduate courses (Statistical Modeling Applied to Ecology and Field course in Coastal and Terrestrial Ecology), with a total of 190 teaching hours at undergraduate and graduate levels.

2020-2022: Eletrosul Centrais Elétricas S.A., Florianópolis, Brazil

Environmental Consulting

- In this position, I am the data scientist responsible for water quality and aquatic communities (phytoplankton, periphyton, macrophytes, zooplankton, and macroinvertebrates) assessment of a monitoring program in a reservoir in central-west Brazil.
- Responsibilities include: harmonize datasets, perform statistical data analysis, write technical reports, provide scientific support to stakeholders, contribute with scientific support for methodological decisions, improve monitoring programs, and develop risk assessment for water quality management.

2018-2019: Ecology, Evolution and Biodiversity Conservation Section at Katholieke Universiteit Leuven, Belgium

Visiting researcher

- Responsibilities include: setup and conduct indoor experiments, culture zooplankton, determine biomass of cladocerans, conduct plankton analysis, enumerate phytoplankton using flow cytometer, present results in scientific and non-scientific international events, and conduct meetings in international universities.
- Achievements: one research funding from the Brazilian government, successfully conducted four indoor experiments in seven months, lead author and co-author of three papers (in preparation or under review), and built a network of international collaborators.

2016-Now: Universidade Federal de Santa Catarina – UFSC, Florianópolis, Brazil

Collaborator researcher

- Project: Long-term biomonitoring program in subtropical Lake in Brazil
- Responsibilities include: lead the plankton group, conduct monthly fieldwork, operate (cleaning, calibration, use and storage) high-frequency sensors for water quality measurements, conduct analysis of plankton and water chemistry, harmonize datasets, perform statistical data analysis, review and write scientific manuscripts, present results in scientific and non-scientific events, conduct meetings, and mentor undergraduate and grad students.

- Achievements: five research funding from the Brazilian government and the private sector, doctoral thesis was awarded the 2021 Best Doctoral Dissertation in the Graduate Program, lead author and co-author of five papers and book chapters.

2013-2016: Universidade Federal do Estado do Rio de Janeiro – UNIRIO, Rio de Janeiro, Brazil
Collaborator researcher

- Project: Stocks of carbon, nitrogen and phosphorus in seven reservoirs of Light Energia SA, Brazil.
- Responsibilities include: conduct monthly fieldwork, conduct analysis of zooplankton and water chemistry, perform statistical data analysis, review and write scientific manuscripts, present results in scientific and non-scientific events.
- Achievements: three research funding from the Brazilian government and the private sector, co-author of one paper.

SKILLS

Programming: R (advanced), Python (elementary), SQL (beginner)
Analytical skills: univariate and multivariate analytics, ecological modeling, spatial statistics, time series analysis, machine learning (beginner)
Computer programs: RStudio, QGIS (elementary), Office, Zotero, Inkscape
Online tools: GitHub (Version control), Trello (Project planning), Doodle (Meetings management), Miro (Brainstorming), Mind Meister (Mind mapping), Connected Papers (Visual tool), Mentimeter (Audience engagement)
Languages: Portuguese (native) and English (advanced)
Experience with: limnology fieldwork, water quality monitoring programs, high-frequency sensors, experimental design, mesocosms set up, water chemistry laboratory work and analysis, microscope planktonic work, ion-chromatography, spectrophotometer analysis, statistical analysis.

SELECTED PUBLICATIONS

Articles submitted to peer-reviewed journals

8. Bomfim, F. de F., Vanvelk, H., **Pinheiro-Silva, L.**, Brans, K. I., Lansac-Tôha, F. A., De Meester, L. The effect of temperature and predation on performance in monoculture and in competition in three Daphniidae differing in body size. Under review in Limnology and Oceanography.

Articles published in peer-reviewed journals

7. Massocato, T., Robles, V., Moreira, B., Castro-Varela, P., **Pinheiro-Silva, L.**, Oliveira, W., Vega, J., Avilés, A., Bonomi Barufi, J., Rörig, L., Figueroa, F.L. Growth, biofiltration and photosynthetic performance of *Ulva* spp. cultivated in fishpond effluents: An outdoor system study. Frontiers in Marine Science, 9:981468, 2022.
6. Alves, J., **Pinheiro-Silva, L.**, Schuster, K., Matthiensen, A., Petrucio, M. Environmental conditions are more effective than nutrient availability and spatial processes on explaining microphytoplankton functional structure in a subtropical hypereutrophic reservoir. Austral Ecology, v. 47, p. 291-305, 2022.
5. Macêdo, R. L., **Pinheiro-Silva, L.**, Klippel, G., Puga, A. L., Rocha, O., Branco, C. W. C. Short-term effects of formaldehyde preservation on length-weight relationship on freshwater cladoceran *Ceriodaphnia silvestrii* Daday 1902. Acta Limnologica Brasiliensia, v. 33, e27.
4. Lopes, M. das N., **Pinheiro-Silva, L.**, Matté, E., Safanelli, J. L., Petrucio, M. M., Leite, N. K. Anthropogenic effects on the pollutant load of forest watersheds in southern Brazil. Fundamental Applied Limnology, v. 195, p. 9-19, 2021.
3. **Pinheiro-Silva, L.**, Gianuca, A. T., Silveira, M. H., Petrucio, M. M. Grazing efficiency asymmetry drives zooplankton top-down control on phytoplankton in a subtropical lake dominated by non-toxic cyanobacteria. Hydrobiologia, v. 847, p. 2307-2320, 2020.
2. Lopes, M. das N., Decarli, C. J., **Pinheiro-Silva, L.**, Lima, T. C., Leite, N. K., Petrucio, M. M. Urbanization increases carbon concentration and pco_2 in subtropical streams. Environmental Science and Pollution Research, v. 27, p. 18371-18381, 2020.

1. Almeida, Rafael M.; Nóbrega, Gabriel N.; Junger, Pedro C.; Figueiredo, Aline V.; Andrade, Anízio S.; de Moura, Caroline G. B.; Tonetta, Denise; Oliveira, Ernandes S.; Araújo, Fabiana; Rust, Felipe; Piñeiro-Guerra, Juan M.; Mendonça, Jurandir R.; Medeiros, Leonardo R.; **Pinheiro, Lorena**; Miranda, Marcela; Costa, Mariana R. A.; Melo, Michaela L.; Nobre, Regina L. G.; Benevides, Thiago; Roland, Fábio; de Klein, Jeroen; Barros, Nathan O.; Mendonça, Raquel; Becker, Vanessa; Huszar, Vera l. M.; Kosten, Sarian. High primary production contrasts with intense carbon emission in a eutrophic tropical reservoir. Frontiers in Microbiology, v.7, p.717, 2016.

Articles in preparation (advanced stage for publication)

14. **Pinheiro-Silva, L.**, Gianuca, A. T., De Meester, L., Declerck, S. A. J. Trait-based zooplankton community assembly and the functioning of aquatic ecosystems along a productivity gradient. In prep for Ecology.
13. **Pinheiro-Silva, L.**, Gianuca, A. T., Moresco, G. A., Lopes, M. N., Rodrigues, L. C., Petrucio, M. M. Negative biodiversity effects caused by cyanobacteria dominance decrease resource use efficiency in a low-nutrient waterbody. In prep for Hydrobiologia.
12. **Pinheiro-Silva, L.**, Pineda, A. Rodrigues, L. C., Lopes, M. N., Miguel, L. G., Simas, S, Ribolli, J., Lopes, C. A., Cardoso, G. F. M., Leite, N. K., Petrucio, M. M., Nuñer, A. P. O. Disentangling the drivers of phytoplankton and zooplankton community assembly in a cascade system in the upper Uruguay River, Brazil. In prep for Science of the Total Environment.
11. Lopes, M. N., **Pinheiro-Silva, L.**, Miguel, L. G., Santos, G. N. T., Bonecker, C. C., Cardoso, G. F. M., Nuñer, A. P. O., Leite, N. K., Petrucio, M. M. Dispersion and Occurrence of *Kellicottia bostoniensis* (Rousselet, 1908) in the upper Uruguay River, Southern Brazil. In prep for CheckList.
10. Lopes, M. N., **Pinheiro-Silva, L.**, Simas, S, Ribolli, J., Lopes, C. A., Cardoso, G. F. M., Nuñer, A. P. O., Leite, N. K., Petrucio, M. M. Spatio-temporal distribution and limiting factors of the non-native species *Limnoperna fortunei* in the Uruguay River basin, Brazil. In prep for Biological Invasions.
9. Paz, R. V., Salustio-Gomes, C., Fernandes, A. B. B., Cavalcanti, V. R., **Pinheiro-Silva, L.**, Pichorim, M., Gianuca, A. T., Assessing scale-dependent effects of urbanization on avian diversity. In prep for Oikos.

PROFESSIONAL ACTIVITIES

Journal Reviewer: Aquatic Sciences (1), Functional Ecology (1), Peer J (1), Hydrobiologia (1), Oecologia Australis (1), Wetlands (1).

Book Reviewer: Fieldwork in Ecology - Babitonga Bay Edition (ISSN: 978-85-8328-069-9; *in Portuguese*).

Funding Reviewer: National Research, Development and Innovation Office, Hungary (NRDI Office).

Society Memberships: The Biodiversity Observation Network (GEO BON 2021-now); Royal Belgian Zoological Society (RBZS 2018-2019); Global Lake Ecological Observatory Network (GLEON 2017-now); British Ecological Society (BES 2017-2021); International Society of Limnology (SIL 2016-2018).

STATEMENT OF CONTRIBUTION TO DIVERSITY, EQUITY, AND INCLUSION

I am part of the young limnologist's group of the Brazilian Society of Limnology (ABLimno), which was created to promote equity, inclusion, and diversity of underrepresented groups in Brazilian Limnology. Our responsibilities include:

- Create programs that provide access for groups traditionally underrepresented, such as women, black people, LGBTQIA+, people with disabilities, indigenous, and quilombolas,
- Coordinate actions to move toward a more inclusive community,
- Mentor and advise students and young limnologists to enhance opportunities to succeed in their careers,
- Attract young leaders to ABLimno, especially those belonging to underrepresented groups,
- Commit to public engagement through a podcast to discuss topics related to diversity, equity, and inclusion,
- Stimulate scientific discussions related to the demands of young limnologists.

OTHER INSTITUTIONAL CONTRIBUTIONS

1. Grant funding: **12**
2. Scientific awards: **3**
2. Organizing committee member: **7**
3. Participation in the examination board: **2**
4. Co-supervision of BSc's thesis: **1**
5. Teaching assistant in undergrad courses: **3**
6. Teaching in elementary and high school: **6**
7. Project participation: **15**
8. Conference presentations: **15**
9. Invited talks: **6**
10. Technical reports: **8**
11. Book chapters published: **8**