LUCAS P. MEDEIROS

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ACADEMIC APPOINTMENTS

Woods Hole Oceanographic Institution *2024 - present*
Postdoctoral Investigator
Supervisors: Heidi Sosik and Michael Neubert

University of California Santa Cruz *2022 - 2024*
Postdoctoral Scholar
Supervisors: Stephan Munch and Eric Palkovacs

EDUCATION

Massachusetts Institute of Technology *2018 - 2022*
Ph.D. in Civil and Environmental Engineering
Advisor: Serguei Saavedra
Thesis: *Understanding and predicting responses of ecological communities to perturbations*

University of São Paulo *2015 - 2017*
M.S. in Ecology
Advisor: Paulo Guimarães Jr
Thesis: *Coevolution in mutualistic networks: gene flow and selection mosaics*

University of São Paulo *2014 - 2017*
B.S. in Applied and Computational Mathematics

University of São Paulo *2009 - 2013*
B.S. in Biological Sciences
Advisor: Paulo Guimarães Jr

PUBLICATIONS

Papers can be accessed from my website.

Submitted:

1. **Medeiros, L. P.**, Neubert, M. G., Sosik, H. M., and Munch, S. B. (Under review). A nonequilibrium framework for community responses to pulse perturbations. https://doi.org/10.1101/2025.05.14.654148

Published:

13. Lerm, R., **Medeiros, L. P.**, Thompson, D., Ehlers Smith, D., and Downs, C. (In press). Bird communities show resilience to an extreme drought across a large savanna protected area. *Global Ecology and Conservation*.

12. Honda, I. A., **Medeiros, L. P.**, Thompson, C. R. S., Britten, G. L., Runge, J. A., and Ji, R. (2025). Seasonal trophic controls drive population variability in a foundational marine copepod. *Scientific Reports*, 15(1), 36018. https://doi.org/10.1038/s41598-025-19919-2

11. **Medeiros, L. P.**, Sorenson, D. K., Johnson, B. J., Palkovacs, E. P., and Munch, S. B. (2025). Revealing unseen dynamical regimes of ecosystems from population time-series data. *Proceedings of the National Academy of Sciences*, 122(24), e2416637122. https://doi.org/10.1073/pnas.2416637122
UCSC press release: *A data-driven model to help avoid ecosystem collapse*
PNAS commentary: *Predicting regime shifts and beyond*

10. **Medeiros, L. P.** and Saavedra, S. (2023). Understanding the state-dependent impact of species correlated responses on community sensitivity to perturbations. *Ecology*, 104(8), e4115. https://doi.org/10.1002/ecy.4115

9. Camacho, L. A., Andreazzi, C. S., **Medeiros, L. P.**, Birskis-Barros, I., Emer, C., Reigada, C., and Guimarães Jr, P. R. (2023). Cheating interactions favor modularity in mutualistic networks. *Oikos*, 2023(3), e09176. https://doi.org/10.1111/oik.09176

8. **Medeiros, L. P.**, Allesina, S., Dakos, V., Sugihara, G., and Saavedra, S. (2023). Ranking species based on sensitivity to perturbations under non-equilibrium community dynamics. *Ecology Letters*, 26(1), 170-183. https://doi.org/10.1111/ele.14131
MIT press release: *A better way to tell which species are vulnerable*

7. **Medeiros, L. P.***, Song, C.*, and Saavedra, S. (2021). Merging dynamical and structural indicators to measure resilience in multispecies systems. *Journal of Animal Ecology*, 90(9), 2027–2040. https://doi.org/10.1111/1365-2656.13421 (*equal contribution)

6. **Medeiros, L. P.**, Boege, K., Del-Val, E., Zaldívar-Riverón, A., and Saavedra, S. (2021). Observed ecological communities are formed by species combinations that are among the most likely to persist under changing environments. *The American Naturalist*, 197(1), E17–E29. https://doi.org/10.1086/711663

5. Saavedra, S., **Medeiros, L. P.**, and AlAdwani, M. (2020). Structural forecasting of species persistence under changing environments. *Ecology Letters*, 23(10), 1511-1521. https://doi.org/10.1111/ele.13582

4. Pires, M. M., O'Donnell, J. L., Burkle, L. A., Diaz-Castelazo, C., Hembry, D. H., Yeakel, J. D., Newman, E. A., **Medeiros, L. P.**, De Aguiar, M. A. M., and Guimarães Jr, P. R. (2020). The indirect paths to cascading effects of extinctions in mutualistic networks. *Ecology*, 101(7), e03080. https://doi.org/10.1002/ecy.3080

3. Cenci, S., **Medeiros, L. P.**, Sugihara, G., and Saavedra, S. (2020). Assessing the predictability of nonlinear dynamics under smooth parameter changes. *Journal of the Royal Society Interface*, 17(162), 20190627. https://doi.org/10.1098/rsif.2019.0627

2. **Medeiros, L. P.**, Garcia, G., Thompson, J. N., and Guimarães Jr, P. R. (2018). The geographic mosaic of coevolution in mutualistic networks. *Proceedings of the National Academy of Sciences*, 115(47), 12017-12022. https://doi.org/10.1073/pnas.1809088115

1. Dáttilo, W., Lara-Rodríguez, N., Jordano, P., Guimarães Jr, P. R., Thompson, J. N., Marquis, R. J., **Medeiros, L. P.**, Ortiz-Pulido, R., Marcos-García, M. A. and Rico-Gray, V. (2016). Unraveling Darwin's entangled bank: architecture and robustness of mutualistic networks with multiple interaction types. *Proceedings of the Royal Society B*, 283(1843), 20161564. https://doi.org/10.1098/rspb.2016.1564

AWARDS

Principles of Community Award -
Fisheries Collaborative Program (UC Santa Cruz) *2024*

Vito Volterra Award for Best Student Oral Presentation -
Theoretical Ecology Section of the ESA 2021 Conference *2021*

Best M.S. Thesis of the year in Ecology -
University of São Paulo *2017*

FELLOWSHIPS

Ph.D. Fellowship - Martin Family Society of Fellows for Sustainability
(MIT Environmental Solutions Initiative) *2021 - 2022*

Ippen Fellowship for Travel Support - Massachusetts Institute of Technology *2020 and 2021*

Ph.D. Scholarship - Swiss Government Excellence Scholarship (declined) *2018*

Laboratory Technician Scholarship - São Paulo Research Foundation *2017 - 2018*

M.S. Scholarship - São Paulo Research Foundation *2015 - 2017*

M.S. Scholarship - National Council for Scientific and Technological Development *2015*
(For the 1st place in the M.S. admissions in Ecology at the University of São Paulo)

Scientific Initiation Scholarship - São Paulo Research Foundation *2014*

TEACHING

Instructor for Modeling for Conservation and Management of Natural Populations -
BIOE-215 (UC Santa Cruz) *Spring 2024*
Created lecture and homework material, lectured, and graded assignments

Instructor for Instituto Serrapilheira's Quantitative Ecology Field Course
(Brazilian Amazon) *July 2023*
Supervised graduate student's field projects

TA for Probability and Causal Inference - 1.010
(Massachusetts Institute of Technology) *Fall 2021*
Planned and conducted recitations

TA for Ecological Dynamics and Modeling - 1.873
(Massachusetts Institute of Technology) *Spring 2021*
Conducted tutorials/discussions and graded problem sets

TA for Probability and Causal Inference - 1.010
(Massachusetts Institute of Technology) *Fall 2020*
Graded problem sets

TA for Ecological Dynamics and Modeling - 1.873
(Massachusetts Institute of Technology) *Spring 2020*
Conducted tutorials/discussions and graded problem sets

TA for Probability and Causal Inference - 1.010
(Massachusetts Institute of Technology) *Fall 2019*
Graded problem sets

TA for EcoEscola Field Course
(University of São Paulo) *January 2017*
Supervised undergraduate student's field projects

TA for Southern-Summer School on Mathematical Biology
(ICTP-SAIFR) *January 2016*
Supervised graduate student's modeling projects

TA for Diversity, Natural History and Conservation of South American Vertebrates
(University of São Paulo) *Fall 2015*
Moderated discussions and graded problem sets

TA for R Language for Data Analysis in Ecology
(University of São Paulo) *March 2014*
Moderated tutorials and graded problem sets

MENTORING

Loreane Dias (University of São Paulo)
Co-advisor of PhD thesis (Advisor: Paulo Inácio Prado) *January 2024 - present*

Thomas Meerwij (Wageningen University)
Co-advisor of Master's thesis (Advisor: Masha van der Sande) *January 2024 - July 2024*

Participated in the mentoring program of the
ESA Theoretical Ecology Section *2023 - present*

PRESENTATIONS

Conference talk - Ecological Society of America
(Baltimore, MD) *August 2025*

Invited talk - Biology Department Seminar
(Woods Hole Oceanographic Institution) *April 2025*

Invited talk - Review of the Cooperative Institute for Marine Ecosystems and Climate
(Scripps Institution of Oceanography) *May 2024*

Conference talk - Ecological Society of America
(Portland, OR) *August 2023*

Invited talk - Emerging Scholars in Integrative Biology
(Boston University) *March 2023*

Conference talk - American Society of Naturalists
(Pacific Grove, CA) *January 2023*

Workshop talk - 20th Annual UCSC & Stanford Species Interactions Workshop
(UC Santa Cruz) *December 2022*

Invited talk - Symposium on market squid
(NOAA Southwest Fisheries Science Center) *November 2022*

Invited talk - Physics of Living Systems
(Massachusetts Institute of Technology) *May 2022*

Invited talk - EcoEncontros at University of São Paulo
(Virtual) *December 2021*

Invited talk - Ecological Resilience Webinar of the British Ecological Society
(Virtual) *September 2021*

Conference talk - Ecological Society of America
(Virtual) *August 2021*

Invited talk - Evolutionary and Ecological Systems Biology talks
(Massachusetts Institute of Technology) *September 2020*

Poster presentation - MIT Quantitative Ecology Meeting
(Massachusetts Institute of Technology) *January 2020*

Conference talk - American Society of Naturalists
(Pacific Grove, CA) *January 2020*

Invited talk - Simple Person's Applied Math Seminar
(Massachusetts Institute of Technology) *September 2019*

Invited talk - Opening lectures of the Graduate Program in Ecology
(University of São Paulo) *March 2018*

Invited talk - EcoEscola

(University of São Paulo) *January 2017*

Conference poster - Evolution
(Austin, TX) *June 2016*

PROFESSIONAL SERVICE

Subject Editor at *Oikos* *2024 - present*

Reviewed manuscripts for the following journals (Web of Science):
Ecology (1), Ecological Complexity (1), Ecology Letters (6),
Ecological Monographs (1), Journal of Animal Ecology (1),
Methods in Ecology and Evolution (1), Nature Communications (1),
Oikos (4), PLOS Computational Biology (1) *2018 - present*

Main organizer of symposium on Population Fluctuations in Ecology
at the ESA 2023 Conference (Portland, OR)
Speakers: Karen Abbott, Jeff Gore, Tanya Rogers, and Daniel Wieczynski *August 2023*

Conducted and presented modeling/data analyses for the
Squid Fishery Advisory Committee in collaboration
with the California Department of Fish and Wildlife *February 2023 - May 2024*

Conducted modeling/data analyses for Covid-19 BR Observatory
in collaboration with several Brazilian researchers
(`https://covid19br.github.io`) *March - May 2020*

Judged talks/posters for awards at 2 ASN and 2 ESA conferences *2020 - present*

Helped organizing the annual Fritz Muller Seminar Series
(University of São Paulo, `https://fritzmuller.weebly.com`) *2014 - 2018*

OCEANOGRAPHIC CRUISES

Main duties: sampled seawater to quantify biological/physical variables, deployed/monitored oceanographic instruments, and analyzed real-time data from oceanographic instruments.

R/V Armstrong (AR88) - 6 days at sea (NES-LTER project) *April 2025*

R/V Atlantic Explorer (AE2426) - 6 days at sea (NES-LTER project) *November 2024*

COMPUTATIONAL SKILLS

Codes can be accessed from my GitHub.

R (advanced)
Python (basic)
C (basic)

Git and GitHub
LaTeX
Microsoft Office

LANGUAGES

English (fluent)
Portuguese (native)
Spanish (basic)