

# LUCAS P. MEDEIROS

Woods Hole Oceanographic Institution

Biology Department - Redfield Building, Room 116

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Last updated on May 19, 2025

## ACADEMIC APPOINTMENTS

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**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

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**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

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*Papers can be accessed from [my website](#).*

### Submitted:

2. **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://www.biorxiv.org/content/10.1101/2025.05.14.654148v1>
1. Lerm, R., **Medeiros, L. P.**, Thompson, D., Ehlers Smith, D., and Downs, C. (Under review). Bird communities show resilience to an extreme weather event, drought, across a large savanna protected area.

## Published:

11. **Medeiros, L. P.**, Sorenson, D. K., Johnson, B. J., Palkovacs, E. P., and Munch, S. B. (In press). Revealing unseen dynamical regimes of ecosystems from population time-series data. *Proceedings of the National Academy of Sciences*.
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 News Article: [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

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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

Scientific Initiation Scholarship - São Paulo Research Foundation

2014

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

2015

## TEACHING

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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

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

Thomas Meerwijk (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 - 2024*

## PRESENTATIONS

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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)	<i>December 2022</i>
Invited talk - Symposium on market squid (NOAA Southwest Fisheries Science Center)	<i>November 2022</i>
Ph.D. thesis defense - Department of Civil and Environmental Engineering (Massachusetts Institute of Technology)	<i>May 2022</i>
Invited talk - Physics of Living Systems (Massachusetts Institute of Technology)	<i>May 2022</i>
Invited talk - EcoEncontros at University of São Paulo (Virtual)	<i>December 2021</i>
Invited talk - Ecological Resilience Webinar of the British Ecological Society (Virtual)	<i>September 2021</i>
Conference talk - Ecological Society of America (Virtual)	<i>August 2021</i>
Invited talk - Evolutionary and Ecological Systems Biology talks (Massachusetts Institute of Technology)	<i>September 2020</i>
Poster presentation - MIT Quantitative Ecology Meeting (Massachusetts Institute of Technology)	<i>January 2020</i>
Conference talk - American Society of Naturalists (Pacific Grove, CA)	<i>January 2020</i>
Invited talk - Simple Person's Applied Math Seminar (Massachusetts Institute of Technology)	<i>September 2019</i>
Invited talk - Opening lectures of the Graduate Program in Ecology (University of São Paulo)	<i>March 2018</i>
Invited talk - EcoEscola (University of São Paulo)	<i>January 2017</i>
Poster presentation - Evolution (Austin, TX)	<i>June 2016</i>

## PROFESSIONAL SERVICE

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Subject Editor at <i>Oikos</i>	<i>2024 - present</i>
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Reviewed manuscripts for the following journals ([Web of Science](#)):  
*Ecology* (1), *Ecological Complexity* (1), *Ecology Letters* (5),

*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 prizes at 2 ASN and 1 ESA conference 2020 - 2023

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

## RESEARCH CRUISES

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*Main duties: sample seawater to analyze biological variables, deploy oceanographic instruments, and  
analyze oceanographic data.*

R/V Armstrong 88 - 6 days at sea ([NES-LTER project](#)) April 2025

R/V Atlantic Explorer 2426 - 6 days at sea ([NES-LTER project](#)) November 2024

## COMPUTATIONAL SKILLS

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*Codes can be accessed from [my GitHub](#).*

R (advanced)  
Python (basic)  
C (basic)  
Git and GitHub  
LaTeX  
Microsoft Office

## LANGUAGES

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