

Matteo Rizzuto

PH.D. · ECOSYSTEM ECOLOGY · MATHEMATICAL MODELLING · CLIMATE CHANGE

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Highlights

- Published 14 peer-reviewed papers, of which 5 as first author and one as shared first author, with a combined 160 citations and an h-index of 7.
- Winner of *Oecologia*'s 2021 Hanski prize for best student-authored paper in animal ecology (as first author) and of the *Journal of Animal Ecology*'s 2021 Sidnie Manton award for best early-career contribution (as co-author).

Education

DOCTOR OF PHILOSOPHY, BIOLOGY	2016–2021
Memorial University of Newfoundland and Labrador	St. John's, NL, Canada
<ul style="list-style-type: none">• Thesis title: From elements to landscapes: the role of terrestrial consumers in ecosystem functioning• Advisor: Dr. Shawn J. Leroux	
MASTER OF RESEARCH (DISTINCTION), ECOLOGY, EVOLUTION, AND CONSERVATION	2013–2014
Imperial College London	London, UK
MASTER OF SCIENCE, EVOLUTION OF ANIMAL AND HUMAN BEHAVIOUR	2009–2012
University of Turin	Turin, Italy
BACHELOR OF SCIENCE (HONOURS), BIOLOGY	2004–2009
University of Turin	Turin, Italy

Research Appointments

POSTDOCTORAL ASSOCIATE	2022–2024
Schmitz Lab, School of the Environment, Yale University	New Haven, USA
VISITING ASSISTANT IN RESEARCH	Feb.–Apr. 2019
Schmitz Lab, School of the Environment, Yale University	New Haven, USA
RESEARCH ASSISTANT	Jan.–Mar. 2016
Pawar Lab, Department of Life Sciences, Imperial College London—Silwood Park	Ascot, UK
RESEARCH ASSISTANT	Jun.–Oct. 2015
Tsaobis Baboon Project, Zoological Society of London	London, UK
RESEARCH ASSISTANT	Jun.–Sept. 2013
Roe & Red Deer in Trentino and Technology Project, Fondazione Edmund Mach	Trento, Italy
GRADUATE INTERN	Jun.–Dec. 2011
Piedmont Wolf Project, Maritime Alps Nature Park	Entracque (CN), Italy
UNDERGRADUATE INTERN	2008–2009
Ethology Lab, University of Turin	Turin, Italy

Publications

A † marks equal contributions. When listed as 2nd or 3rd author, I contributed to ideas, design, data collection and analysis, interpretation, and writing. When listed as 4th author or later, I contributed to ideas, data collection, and writing.

Peer reviewed

14. [Rizzuto, M.](#), Leroux, S. J., Schmitz, O. J. 2024. Rewiring the carbon cycle: a theoretical framework for animal-driven ecosystem carbon sequestration. *Journal of Geophysical Research: Biogeosciences* **129**, e2024JG008026. [10.1029/2024JG008026](#). **Research Spotlight**

Media coverage

- Scharping, N. Animals deserve to be included in global carbon cycle models, too. *Eos* **105**. 16 April 2024.
- Dinneen, J. Animals may help ecosystems store 3 times more carbon than we thought. *The New Scientist*. 19 April 2024.

13. Rizzuto, M., Leroux, S. J., Schmitz, O. J., Vander Wal, E., Wiersma, Y. F., Heckford, T. R. 2024. Animal-vectored nutrient flows across resource gradients influence the nature of local and meta-ecosystem functioning. *Ecological Modelling* **488**, 110570. doi: [10.1016/j.ecolmodel.2023.110570](https://doi.org/10.1016/j.ecolmodel.2023.110570).
 12. McLeod, A.M., Leroux, S.J., Rizzuto, M., Leibold, M.A., Schiesari, L. 2024. Integrating ecosystem and contaminant models to predict the effects of ecosystem fluxes on contaminant dynamics. *Ecosphere*, **15**(1): e4739. doi: [10.1002/ecs2.4739](https://doi.org/10.1002/ecs2.4739)
 11. Heckford, T.R., Leroux, S.J., Vander Wal, E., Rizzuto, M., Balluffi-Fry, J., Richmond, I.C., Wiersma, Y.F. 2022. Ecoregion and community structure influences on the foliar elemental niche of balsam fir (*Abies balsamea* (L.) Mill.) and white birch (*Betula papyrifera* Marshall). *Ecology and Evolution* **12**, e9244. doi: [10.1002/ece3.9244](https://doi.org/10.1002/ece3.9244).
 10. Little, C.J.[†], Rizzuto, M.[†], Luhning, T.M., Monk, J.D., Nowicki, R.J., Paseka, R.E., Stegen, J.C., Symons, C.C., Taub, F.B., Yan, J.D.L. 2022. Movement with Meaning: Integrating Information into Meta-Ecology. *Oikos* **8**, e08892. doi: [10.1111/oik.08892](https://doi.org/10.1111/oik.08892). **Editor's Choice**
 9. Balluffi-Fry, J., Leroux, S.J., Wiersma, Y.F., Richmond, I.C., Heckford, T.R., Rizzuto, M., Kennah, J.L., Vander Wal, E. 2022. Integrating plant stoichiometry and feeding experiments: state-dependent forage choice and its implications on body mass. *Oecologia* **198**(3), 579–591. doi: [10.1007/s00442-021-05069-5](https://doi.org/10.1007/s00442-021-05069-5).
 8. Richmond, I.C., Balluffi-Fry, J., Vander Wal, E., Leroux, S.J., Rizzuto, M., Heckford, T.R., Kennah, J.L., Riefesel, G.R., Wiersma, Y.F. 2022. Individual snowshoe hares manage risk differently: integrating stoichiometric distribution models and foraging ecology. *Journal of Mammalogy* **103**(1), 196–208. doi: [10.1093/jmammal/gyab130](https://doi.org/10.1093/jmammal/gyab130).
 7. Heckford, T.R., Leroux, S.J., Vander Wal, E., Rizzuto, M., Balluffi-Fry, J., Richmond, I.C., Wiersma, Y.F. 2022. Spatially explicit correlates of plant functional traits inform landscape patterns of resource quality. *Landscape Ecology* **37**, 59–80. doi: [10.1007/s10980-021-01334-3](https://doi.org/10.1007/s10980-021-01334-3).
 6. Rizzuto, M., Leroux, S.J., Vander Wal, E., Richmond, I.C., Heckford, T.R., Balluffi-Fry, J., Wiersma, Y.F. 2021. Forage stoichiometry predicts the home range size of a small terrestrial herbivore. *Oecologia* **197**(2), 327–338. doi: [10.1007/s00442-021-04965-0](https://doi.org/10.1007/s00442-021-04965-0). **Winner, Hanski Prize 2021**
 5. Ellis-Soto, D.[†], Ferraro, K.M.[†], Rizzuto, M., Briggs, E., Monk, J.D., and Schmitz, O.J. 2021. A methodological roadmap to quantify animal-vectored spatial ecosystem subsidies. *Journal of Animal Ecology* **90**(7), 1605–1622. doi: [10.1111/1365-2656.13538](https://doi.org/10.1111/1365-2656.13538). **Winner, Sidnie Manton Award 2021**
 4. Richmond, I.C., Leroux, S.J., Vander Wal, E., Heckford, T.R., Rizzuto, M., Balluffi-Fry, J., Kennah, J., Wiersma, Y.F. 2021. Temporal variation and its drivers in the elemental traits of four boreal plant species. *Journal of Plant Ecology* **14**(3), 398–413. doi: [10.1093/jpe/rtaa103](https://doi.org/10.1093/jpe/rtaa103).
 3. Balluffi-Fry, J., Leroux, S.J., Wiersma, Y.F., Heckford, T.R., Rizzuto, M., Richmond, I.C., Vander Wal, E. 2020. Quantity-quality trade-offs revealed using a multiscale test of herbivore resource selection on elemental landscapes. *Ecology and Evolution* **10**(24), 13847–13859. doi: [10.1002/ece3.6975](https://doi.org/10.1002/ece3.6975).
 2. Rizzuto, M., Leroux, S.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R., Balluffi-Fry, J. 2019. Patterns and potential drivers of intraspecific variability in the body C, N, and P composition of a terrestrial vertebrate, the snowshoe hare (*Lepus americanus*). *Ecology and Evolution* **9**(24), 14453–14464. doi: [10.1002/ece3.5880](https://doi.org/10.1002/ece3.5880).
 1. Rizzuto, M., Carbone, C., and Pawar, S. 2018. Foraging constraints reverse the scaling of activity time in carnivores. *Nature Ecology and Evolution* **2**(2), 247–253. doi: [10.1038/s41559-017-0386-1](https://doi.org/10.1038/s41559-017-0386-1). **Cover Story**
- Media coverage**
- John, J. Constantly on the hunt, midsize carnivores face unique risks. *The Wildlife Society*. 4 January 2018.

Outreach

- Wiersma, Y.F., Catto, N., Deal, C., Edinger, E., Evans, R., Geissinger, E., Hearn, C., Sun Lim, K., McCann, N., MacDonald, K., Meyer, A., Prosser, J., Quinn, D., Richmond, I.C., Rizzuto, M., Roncal, J., Swain, M. 2020. The classroom goes virtual—experiences at Memorial University. *Blog post*. url: <https://nllandscapeecology.com>.
- Cagnacci, F., Rocca, M., Nicoloso, S., Ossi, F., Peters, W., Mancinelli, S., Valent, M., Rizzuto, M., Hebblewhite, M. 2013. Il progetto 2C2T. *Il Cacciatore Trentino*, 93, 4–15. url: <https://en.calameo.com/>.

Presentations

Conference Talks

- Rizzuto, M., Leroux, S.J., Schmitz, O.J. *Modeling the zoogeographical effects of herbivores on ecosystem carbon cycles*. “For All Ecologists” Ecological Society of America Annual Meeting, Portland, OR, USA. 6–11 Aug. 2023

Invited talk

- **Rizzuto, M.**, Leroux, S.J., Schmitz, O.J. *Modeling the zoogeochemical effects of herbivores on ecosystem carbon cycles*. 6th Yale Postdoc Association Annual Symposium, New Haven, CT, USA. 25 May 2023
- **Rizzuto, M.**, Leroux, S.J., Schmitz, O.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R. *Movers and shakers: Animal-vectored nutrient flows across resource gradients influence local and meta-ecosystem functioning*. “Ecological Models for Tomorrow’s Solutions” The International Society for Ecological Modelling Global Conference 2023, Toronto, ON, Canada. 2–6 May 2023
- **Rizzuto, M.**, Leroux, S.J., Schmitz, O.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R. *Going against the flow: non-diffusive organismal movement influences local and meta-ecosystem functioning*. “Vital Connections in Ecology” Ecological Society of America Virtual Annual Meeting, Long Beach, CA, USA. 2–6 Aug. 2021
- **Rizzuto, M.**, Leroux, S.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R., Balluffi-Fry, J. *Ontogeny and Ecological Stoichiometry of Snowshoe hares (*Lepus americanus*) in the Boreal Forests of Newfoundland*. Canadian Society for Ecology and Evolution Annual General Meeting, Guelph, ON, Canada. 18–21 Jul. 2018
- **Rizzuto, M.**, Carbone, C., and Pawar, S. *Bio-mechanical constraints on foraging reverse the scaling of activity rate among carnivores*. Canadian Society for Ecology and Evolution Annual General Meeting, St. John’s, NL, Canada. 7–11 Jul. 2016

Conference Posters

- **Rizzuto, M.**, Leroux, S.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R., Balluffi-Fry, J. *Beyond Diffusion: Animal-Mediated Nutrient Transport at Different Spatial Scales*. “Unifying Ecology Across Scales” Gordon Research Seminar and Conference, Biddeford, ME, USA. 21–27 Jul. 2018

Workshops

- **Rizzuto, M.** *Grammar of Graphics: ggplot2*. Part of SPRY: A Learning Community for Quantitative Skill-Sharing Yale University, School of the Environment. 4 Nov. 2022
- **Rizzuto, M.** *(R)markdown: a brief tour*. Part of SPRY: A Learning Community for Quantitative Skill-Sharing Yale University, School of the Environment. 14 Oct. 2022

Outreach

- **Rizzuto, M.** *How animals shape our world: ecosystems, nutrient cycling, and carbon capture*. Wolfram Ecological Research Colloquium. 26 Apr. 2024

Skype-a-Scientist initiative

- **Rizzuto, M.** Edward Jones Scientist Expo Week. 16 Apr. 2024
- **Rizzuto, M.** Hope Township Elementary School. 22 Mar. 2023

Teaching

YALE UNIVERSITY

2022–2024

Guest Lecturer

New Haven, USA

THE MODERN INSTRUCTOR, Lecture series

Fall 2023

- Design and delivered two lectures on ecosystem ecology and climate change aimed at a generalist audience

ECOSYSTEMS AND LANDSCAPES, Graduate course

Fall 2023

- Lead instructor on one of five course modules, focused on linking biodiversity to biogeochemistry

INDUSTRIAL ECOLOGY, Graduate course

Fall 2022

- Crafted and delivered a lecture introducing ideas and theories from metabolic ecology to urban ecology

MEMORIAL UNIVERSITY OF NEWFOUNDLAND AND LABRADOR

2017–2020

Teaching Assistant and Guest Lecturer

St. John’s, Canada

MODELS IN BIOLOGY, Graduate and Undergraduate course

Winter 2020

- Designed and delivered lectures on classical models in Ecology, models of species interactions, and meta-ecology models

PRINCIPLES OF ECOLOGY, Undergraduate course

Fall 2018

- Managed the online learning part of the course, provided administrative and academic support to students

GRADUATE CORE SEMINAR, Graduate course

Fall 2018

- Developed and delivered a seminar on Student-Supervisor Communications

PRINCIPLES OF BIOLOGY, Undergraduate course

Winter 2017

- Assisted during lab-based lectures, marked lab reports, midterms, and invigilated final exams

IMPERIAL COLLEGE LONDON	2014–2015
Teaching Assistant	London, UK
ECOLOGY, Undergraduate course	Spring 2015
• Demonstrator for the course’s field trip, helped students design, collect data, and run analyses for their final projects	
BEHAVIORAL ECOLOGY, Undergraduate course	Winter 2015
• Assisted with lab-based lectures, from experiment setup to helping students with lab data analysis	
INTRODUCTION TO BIOLOGICAL STATISTICS, Undergraduate course	Fall 2014
• Helped students learn base and advanced R language, facilitated Q&A sessions ahead of final exams	
STATISTICS, Graduate course	Fall 2014
• Helped students in developing and coding statistical analyses in R	
MACROECOLOGY AND CLIMATE CHANGE, Graduate course	Fall 2014
• Assisted students using the species distribution software Maxent	

Service

Note: *Memorial University* stands for Memorial University of Newfoundland and Labrador.

Editorial

SUBJECT MATTER EDITOR, GENERAL ECOLOGY	2024–Present
Ecosphere	

Reviewer

ECOLOGY AND EVOLUTION	2021, 2024
ROYAL SOCIETY OPEN SCIENCES	2024
BIOLOGICAL CONSERVATION	2021, 2022
SCIENCE OF THE TOTAL ENVIRONMENT	2019

Conference organization

6 TH AND 7 TH ANNUAL POSTDOC SYMPOSIUM	2023–2024
Yale University	New Haven, CT, USA

Community

YALE POSTDOCTORAL ASSOCIATION	2022–2024
Yale University	New Haven, CT, USA

- Buddy Program Mentor, 2023–2024
- Symposium Committee Co-coordinator, 2023
- Symposium Committee Member, 2022

BIOLOGY GRADUATE STUDENT ASSOCIATION	2017–2020
Memorial University	St. John’s, NL, Canada
• Communications officer, 2019–2020	
• Chairperson, 2018–2019	
• Seminar Co-coordinator, 2017–2018	

EDUCATOR	2000–2013
Associazione O.A.S.I.—Operazione Mato Grosso di Torino	Turin, Italy
TEAM LEADER	2005–2006
XX Winter Olympic and IX Paralympic Games	Turin, Italy

Professional Development

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Courses

THE MODERN INSTRUCTOR LECTURE SERIES	November 2023
Yale Postdoc Association and Yale Poorvu Center for Teaching and Learning	Yale University
MENTORSHIP TRAINING PROGRAM FOR YALE POSTDOCS	March 2023
Office for Postdoctoral Affairs	Yale University
CAREER DEVELOPMENT LEADERS PROGRAM	Jan.–Mar. 2023
Office of Career Strategy	Yale University

BECOMING A MORE EQUITABLE EDUCATOR: MINDSETS AND PRACTICES

MIT Teaching Systems Lab

TEACHING SKILLS ENHANCEMENT PROGRAM

Centre for Innovation in Teaching and Learning

Mar.–Jun. 2020

Attended online at edX.org

Sept. 2019–Aug. 2020

Memorial University

Workshops

ADVANCED TEACHING WORKSHOPS: WRITING THE TEACHING STATEMENT

Yale Poorvu Center for Teaching and Learning

14 September 2023

Yale University

THE ART OF TEACHING: BALANCING PASSIVE AND ACTIVE LEARNING

Yale Postdoc Association and Yale Poorvu Center for Teaching and Learning

13 September 2023

Yale University

INCLUSIVE LEADERSHIP TRAINING

Yale Postdoc Association and Yale DEI Office

30 Aug. 2023

Yale University

BYSTANDER INTERVENTION TRAINING

Yale Postdoc Association

13 Jun. 2023

Yale University

HOW TO HELP: TIPS FROM MENTAL HEALTH FIRST AID

Being Well at Yale

1 Mar. 2023

Yale University

ALT-ACADEMIC CAREER Q&A

Early Career Section

8–9 Feb. 2023

Ecological Society of America

HOW TO WRITE AN EFFECTIVE DIVERSITY STATEMENT

Graduate Writing Lab

11 Oct. 2022

Yale University

BUILDING YOUR BRAND WORKSHOP

Beyond the PhD

8 Sept. 2022

Attended online

REPRODUCIBLE RESEARCH THROUGH OPEN SCIENCE

Canadian Institute for Ecology and Evolution & NSERC-CREATE “Living Data Project”

11 Jun. 2020

Attended online at osf.io

TEACHING INCLUSIVELY & EQUITABLY ONLINE

American Society for Engineering Education & NSF INCLUDES Aspire Alliance

21 May 2020

Attended online

H5P MAKER SESSION

Centre for Innovation in Teaching and Learning

24 Oct. 2019

Memorial University

COMMUNITY OF INQUIRY COFFEE BREAK: OPEN ACCESS

Centre for Innovation in Teaching and Learning

23 Oct. 2019

Memorial University

OPEN ACCESS AND SCHOLARLY PUBLISHING

Centre for Innovation in Teaching and Learning

22 Oct. 2019

Memorial University

FOUR THINGS TO CONSIDER FOR GRADUATE STUDENT TEACHING

Enhanced Development of the Graduate Experience

8 Nov. 2018

Memorial University

AARMS CRG SOFTWARE CARPENTRY WORKSHOP

The Carpentries

27 May 2017

Memorial University

Honors & Awards

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HANSKI PRIZE, Oecologia

2021

MITACS RESEARCH TRAINING AWARD, Mitacs, St. John's, Canada

2020

MITACS GLOBALINK RESEARCH AWARD, Mitacs, St. John's, Canada

2019

DEAN'S DOCTORAL AWARD, Memorial University, St. John's, Canada

2016–2020

GRADUATED WITH DISTINCTION, Imperial College London, London, UK

2014

ERASMUS-LLP SCHOLARSHIP, University of Turin, Turin, Italy

2010

Professional Affiliations

INTERNATIONAL SOCIETY FOR ECOLOGICAL MODELLING

2023–2025

ECOLOGICAL SOCIETY OF AMERICA

2021–2023

CANADIAN SOCIETY FOR ECOLOGY AND EVOLUTION

2016–2021