Matteo Rizzuto

Postdoctoral Associate · School of the Environment, Yale University

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Pronouns: he/him/his

Highlights

- Published 14 peer-reviewed papers, of which 5 as first author and one as shared first author, with a combined 151 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).

Current position

Postdoctoral Associate *2022–Present*

Schmitz Lab, School of the Environment, Yale University *New Haven, USA*

- Developing new mathematical models to investigate animal-mediated effects on ecosystem carbon budgets
- Working with non-governmental organizations to inform rewilding efforts and expand nature-based climate change solutions

Education

Doctor of Philosophy, Biology *2016–2021*

Memorial University of Newfoundland and Labrador *St. John's, NL, Canada*

- 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*

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.

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

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.

10. Little, C.J.[†], Rizzuto, M.[†], Luhring, 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. ***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.
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.
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.
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. ***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. ***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.
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.
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.
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. ***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 zoogeochemical 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. *Skype-a-Scientist*, Hope Township Elementary School. 22 Mar. 2023

Teaching

Yale University *2022–Present*
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

Research Appointments

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*

Service

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

Manuscript reviewer

Ecology and Evolution — *2021, 2024*
Royal Society Open Sciences — *2024*
Biological Conservation — *2021, 2022*
Science of the Total Environment — *2019*

Conferences organized

6TH and 7TH Annual Postdoc Symposium — *2023–2024*
Yale University — *New Haven, CT, USA*

Volunteer and community work

Yale Postdoctoral Association — *2022–Present*
Yale University — *New Haven, CT, USA*

- Buddy Program Mentor, Present
- 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 — *Mar.–Jun. 2020*
MIT Teaching Systems Lab — *Attended online at edX.org*

Teaching Skills Enhancement Program — *Sept. 2019–Aug. 2020*
Centre for Innovation in Teaching and Learning — *Memorial University*

Workshops

Advanced Teaching Workshops: writing the teaching statement — *14 September 2023*
Yale Poorvu Center for Teaching and Learning — *Yale University*

The Art of Teaching: balancing passive and active learning — *13 September 2023*
Yale Postdoc Association and Yale Poorvu Center for Teaching and Learning — *Yale University*

Inclusive Leadership Training — *30 Aug. 2023*
Yale Postdoc Association and Yale DEI Office — *Yale University*

Bystander Intervention Training — *13 Jun. 2023*
Yale Postdoc Association — *Yale University*

How to Help: tips from mental health first aid — *1 Mar. 2023*
Being Well at Yale — *Yale University*

Alt-Academic Career Q&A — *8-9 Feb. 2023*
Early Career Section — *Ecological Society of America*

How to Write an Effective Diversity Statement — *11 Oct. 2022*
Graduate Writing Lab — *Yale University*

Building Your Brand Workshop — *8 Sept. 2022*
Beyond the PhD — *Attended online*

Reproducible Research through Open Science — *11 Jun. 2020*
Canadian Institute for Ecology and Evolution & NSERC-CREATE "Living Data Project" — *Attended online at osf.io*

Teaching Inclusively & Equitably Online — *21 May 2020*
American Society for Engineering Education & NSF INCLUDES Aspire Alliance — *Attended online*

H5P Maker Session — *24 Oct. 2019*
Centre for Innovation in Teaching and Learning — *Memorial University*

Community of Inquiry Coffee Break: Open Access — *23 Oct. 2019*
Centre for Innovation in Teaching and Learning — *Memorial University*

Open Access and Scholarly Publishing — *22 Oct. 2019*
Centre for Innovation in Teaching and Learning — *Memorial University*

Four Things to Consider for Graduate Student Teaching — *8 Nov. 2018*
Enhanced Development of the Graduate Experience — *Memorial University*

AARMS CRG Software Carpentry Workshop — *27 May 2017*
The Carpentries — *Memorial University*

Honors & Awards

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Hanski Prize, Oecologia — *2021*
Mitacs Research Training Award, Mitacs, St. John's, Canada — *2020*
First Place–H5P Maker Session, Memorial University, St. John's, Canada — *2019*
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*