

Justin Kitzes

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Department of Biological Sciences
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BIOGRAPHY

Justin Kitzes is an Assistant Professor of Biological Sciences at the University of Pittsburgh. He received his Ph.D. from the University of California, Berkeley (Environmental Science, Policy, and Management) and his B.S. and M.S. degrees from Stanford University (Earth Systems). His research focuses on understanding and predicting species diversity and distributions in human-altered landscapes, as well as applying this knowledge to inform conservation in fragmented habitats. His specific interests include spatial macroecology, the species-area relationship, community turnover in space and time, extinction prediction, acoustic recording technology, bird call classification, ecological software development, reproducible research, and sustainability accounting.

EDUCATION

- 2012 **Ph.D., Environmental Science, Policy, and Management**
University of California Berkeley
- 2005 **B.S. and M.S., Earth Systems**
Stanford University

PROFESSIONAL HISTORY

- 2017– **Assistant Professor**, Department of Biological Sciences
University of Pittsburgh
- 2014–2017 **Data Science Fellow**, Berkeley Institute for Data Science
University of California, Berkeley
- 2013–2017 **Postdoctoral Scholar and Lecturer**, Energy and Resources Group
University of California, Berkeley
- 2006–2008 **Manager**, Research and Standards Department
Global Footprint Network

GRANTS & FELLOWSHIPS

- 2014–2017 *Data Science Fellowship*, Berkeley Institute for Data Science (\$150,000)
- 2009–2012 *Graduate Research Fellowship*, National Science Foundation (\$121,000)
- 2008 *Chancellor's Fellowship*, University of California, Santa Barbara (\$63,000 – declined)
- 2003 *SIG International Fellowship*, Stanford in Government and WWF Belize (\$3,000)

PUBLICATIONS

Citations: 3,256, h-index: 16 ([Google Scholar](#)). Student and mentee authors are underlined.

Books

- 2018 **Kitzes, J.**, Turek, D., & Imamoglu, F. (Eds.) *The Practice of Reproducible Research: Case-Studies and Lessons from the Data-Intensive Sciences*. Oakland, CA: University of California Press.

Journal Articles

- 2017 **Kitzes, J.**, Berlow, E., Conlisk, E., Erb, K., Iha, K., Martinez, N., Newman, E. A., Plutzer, C., Smith, A. B., & Harte, J. [Consumption-based conservation targeting: Linking biodiversity loss to economic consumption through a global wildlife footprint](#). *Conservation Letters*, 10(5): 531-538.

Wilson, G., Bryan, J., Cranston, K., **Kitzes, J.**, Nederbragt, L., & Teal, T. K. [Good enough practices for scientific computing](#). *PLoS Computational Biology*, 13(6): e1005510.

- 2016 Kelly, R., **Kitzes, J.**, Wilson, H., & Merenlender, A. [Habitat diversity promotes bat activity in a vineyard landscape](#). *Agriculture, Ecosystems and Environment*, 223, 175-181.

Kitzes, J., & Wilber, M. [macroeco: Reproducible ecological pattern analysis in Python](#). *Ecography* 39, 361-367.

Kitzes, J., & Shirley, R. [Estimating biodiversity impacts without field surveys: A case study in northern Borneo](#). *Ambio*, 45(1), 110-119.

- 2015 **Kitzes, J.**, & Harte, J. [Predicting extinction debt from community patterns](#). *Ecology*, 96(8), 2172-2136.

Wilber, M., **Kitzes, J.**, & Harte, J. [Scale collapse and the emergence of the power law species-area relationship](#). *Global Ecology and Biogeography*, 24(8), 883-895.

McGlinn, D., Xiao, X., **Kitzes, J.**, & White, E. [Exploring the spatially explicit predictions of the Maximum Entropy Theory of Ecology](#). *Global Ecology and Biogeography*, 24(6), 675-684.

- 2014 Harte, J., & **Kitzes, J.** [Inferring regional-scale species diversity from small-plot censuses](#). *PLoS ONE*, 10(2), e0117527.

Kitzes, J., & Harte, J. [Beyond the species-area relationship: Improving macroecological extinction estimates](#). *Methods in Ecology and Evolution*, 5(1), 1-8.

- Kitzes, J., & Merenlender, A.** Large roads reduce bat activity across multiple species. *PLoS ONE*, 5(1), 1-8.
- 2013 **Kitzes, J., & Merenlender, A.** Extinction risk and tradeoffs in reserve site selection for species of different body sizes. *Conservation Letters*, 6(5), 341-349.
- Kitzes, J.** An introduction to environmentally-extended input-output analysis. *Resources*, 2(4), 489-503.
- Harte, J., **Kitzes, J.**, Newman, E., & Rominger, A. Taxon categories and the universal species-area relationship. *The American Naturalist*, 181(2), 282-287.
- Ramage, B. S., **Kitzes, J.**, Marshalek, E. C., & Potts, M. D. Optimized Floating Refugia: A new strategy for species conservation in production forest landscapes. *Biodiversity and Conservation*, 22(3), 789-801.
- Ramage, B. S., Marshalek, E. C., **Kitzes, J.**, & Potts, M. D. Conserving tropical biodiversity via strategic spatiotemporal harvest planning. *Journal of Applied Ecology*, 50(6), 1301–1310.
- 2012 Barnosky, A. D., Hadly, E. A., Bascompte, J., Berlow, E. L., Brown, J. H., Fortelius, M., Getz, W. M., Harte, J., Hastings, A., Marquet, P. A., Martinez, N. D., Mooers, A., Roopnarine, P., Vermeij, G., Williams, J. W., Gillespie, R., **Kitzes, J.**, Marshall, C., Matzke, N., Mindell, D. P., Revilla, E., & Smith, A. B. Approaching a state shift in Earth's biosphere. *Nature*, 486, 52-58.
- Leach, A. M., Galloway, J. N., Bleeker, A, Erisman, J.W., Kohn, R., & **Kitzes, J.** A nitrogen footprint model to help consumers understand their role in nitrogen losses to the environment. *Environmental Development*, 1, 40-66.
- Galli, A., **Kitzes, J.**, Niccolucci, V., Wackernagel, M., Wada, Y., & Marchettini, N. Assessing the global environmental consequences of economic growth through the Ecological Footprint: a focus on China and India. *Ecological Indicators*, 17, 99-107.
- 2010 Khagram, S., Nicholas, K. A., Bever, D. M., Warren, J., Richards, E. H., Oleson, K., **Kitzes, J.**, Katz, R., Hwang, R., Goldman, R., Funk, J., & Brauman, K. A. Thinking about knowing: conceptual foundations for interdisciplinary environmental research. *Environmental Conservation*, 37(4), 388-397.
- 2009 **Kitzes, J.**, & Wackernagel, M. Answers to common questions in Ecological Footprint accounting. *Ecological Indicators*, 9(4), 812-817.
- Kitzes, J.**, Moran, D., Galli, A., Wada, Y., & Wackernagel, M. Interpretation and application of the Ecological Footprint: A reply to Fiala (2008). *Ecological Economics*, 68(4), 929-930.

- Kitzes, J.**, Galli, A., Bagliani, M., Barrett, J., Dige, G., Ede, S., et al. [A research agenda for improving national Ecological Footprint accounts](#). *Ecological Economics*, 68(7), 1991-2007.
- Moran, D. D., Wackernagel, M. C., **Kitzes, J. A.**, Heumann, B. W., Phan, D., & Goldfinger, S. H. [Trading spaces: Calculating embodied Ecological Footprints in international trade using a Product Land Use Matrix \(PLUM\)](#). *Ecological Economics*, 68(7), 1938-1951.
- 2008 **Kitzes, J.**, Wackernagel, M., Loh, J., Peller, A., Goldfinger, S., Cheng, D., & Tea, K. [Shrink and share: humanity's present and future Ecological Footprint](#). *Philosophical Transactions of the Royal Society B*, 363(1491), 467-475.
- Moran, D. D., Wackernagel, M., **Kitzes, J. A.**, Goldfinger, S. H., & Boutaud, A. [Measuring sustainable development – Nation by nation](#). *Ecological Economics*, 64(3), 470-474.
- Nicolucci, V., Galli, A., **Kitzes, J.**, Pulselli, R., Borsa, S., & Marchettini, N. [Ecological Footprint analysis applied to the production of two Italian wines](#). *Agriculture, Ecosystems & Environment*, 128(3), 162-166.
- 2007 Galli, A., **Kitzes, J.**, Wermer, P., Wackernagel, M., Nicolucci, V., & Tiezzi, E. [An exploration of the mathematics behind the ecological footprint](#). *International Journal of Ecodynamics*, 2(4), 250-257.
- 2006 Wackernagel, M., **Kitzes, J.**, Moran, D., Goldfinger, S., & Thomas, M. [The Ecological Footprint of cities and regions: comparing resource availability with resource demand](#). *Environment and Urbanization*, 18(1), 103-112.
- 2005 **Kitzes, J. A.**, & Denny, M. W. [Red algae respond to waves: morphological and mechanical variation in *Mastocarpus papillatus* along a gradient of force](#). *The Biological Bulletin*, 208, 114-119.

Book Chapters

- 2018 **Kitzes, J.** [Introduction](#). In J. Kitzes, D. Turek, & F. Deniz (Eds.), *The Practice of Reproducible Research: Case Studies and Lessons from the Data-Intensive Sciences*. Oakland, CA: University of California Press.
- Kitzes, J.** [The basic reproducible workflow template](#). In J. Kitzes, D. Turek, & F. Deniz (Eds.), *The Practice of Reproducible Research: Case Studies and Lessons from the Data-Intensive Sciences*. Oakland, CA: University of California Press.
- Kitzes, J.** [Analyzing bat distributions in a human-dominated landscape with autonomous acoustic detectors and machine learning models](#). In J. Kitzes, D. Turek, & F. Deniz (Eds.), *The Practice of Reproducible Research: Case Studies and Lessons from the Data-Intensive Sciences*. Oakland, CA: University of California Press.

- 2012 Harte, J., & Kitzes, J. [The use and misuse of species-area relationships in predicting climate-driven extinction](#). In L. Hannah (Ed.), *Saving a Million Species: Extinction Risk from Climate Change* (pp. 73-86). Washington, DC: Island Press.
- 2008 Wackernagel, M., & Kitzes, J. [Ecological Footprint](#). In S. Jorgensen & B. Fath (Eds.), *Encyclopedia of Ecology* (pp. 1031-1037). Amsterdam, The Netherlands: Elsevier.

PRESENTATIONS

Submitted Talks

- 2017 *Identifying and locating birds from field recordings*. Moore-Sloane Data Science Environments, Annual Summit, New Orleans, LA, November 2017.
- A spatially explicit stochastic process model predicts scaling in species aggregation*. Ecological Society of America, Annual Meeting, Portland, OR, August 2017.
- 2016 *Predicting future extinction debt from present-day community patterns*. American Society of Naturalists, Annual Meeting, Pacific Grove, CA, January 2016.
- 2015 *Deriving spatially-explicit beta diversity metrics from spatially-implicit, plot-based data*. Ecological Society of America, Annual Meeting, Baltimore, MD, August 2015
- Stop using the power law species-area relationship (and what to do instead)*. Ecological Society of America, Annual Meeting, Baltimore, MD, August 2015
- 2014 *Predicting extinction rates in space and time: A macroecological approach*. Ecological Society of America, Annual Meeting, Sacramento, CA, August 2014
- Linking biodiversity loss to economic consumption through a global wildlife footprint*. Society for Conservation Biology, North America Congress, Missoula, MT, July 2014.
- Predicting future extinction debt from present-day community patterns*. Mathematics of Planet Earth 2013+, Berkeley, CA, May 2014.
- 2013 *A simple dynamic model for predicting variation in species spatial patterns [Poster]*. Workshop on Frontiers of Macroecological Theory, Berkeley, CA, February 2013.
- California bats avoid roads*. Wildlife Society Western Section, Annual Meeting, Sacramento, CA, January 2013.
- 2012 *The tradeoff between patch size and clustering in designing reserve networks*. Society for Conservation Biology, North America Congress, Oakland, CA, July 2012.

- 2011 *Linking biodiversity loss to global consumption behavior: Preliminary results [Poster]*. National Academies Keck Futures Initiative, Conference on Ecosystem Services, Irvine, CA, November 2011.
- Designing reserve networks for community persistence: An allometric community approach [Poster]*. Ecological Society of America, Annual Meeting, Austin, TX, August 2011.
- Designing reserve networks for biodiversity persistence: An allometric community approach [Poster]*. University of California Berkeley Department of Environmental Science, Policy, and Management, Graduate Research Symposium, Berkeley, CA, May 2011.
- 2009 *National ecological footprint accounts: Measuring global demand for ecosystem goods and services*. Bay Area Conservation Biology Symposium, Stanford, CA, February 2009.
- 2007 *A “constant global hectare” method for representing ecological footprint time trends*. International Ecological Footprint Conference, Cardiff, United Kingdom. May 2007.
- A research agenda for improving national ecological footprint accounts*. International Ecological Footprint Conference, Cardiff, United Kingdom. May 2007.

Invited Seminars

- 2017 *Too little data, too few laws: Thoughts on the future of ecology*. University of Pittsburgh, Department of Biological Sciences, Pittsburgh, PA, September 2017.
- 2016 *Spatial ecology and biodiversity in complex landscapes: Scaling laws, turnover, and disturbance gradients*. University of Pittsburgh, Department of Biological Sciences, Pittsburgh, PA, December 2016.
- Reproducible ecological data analysis in Python with the macroeco package*. Berkeley Institute for Data Science, Berkeley, CA, May 2016.
- The changing face of field ecology: Remote sensing, software, and big data*. Lawrence Berkeley National Laboratory, Berkeley, CA, March 2016.
- Spatial ecology in human-altered habitats: Understanding and predicting the effects of global change on ecological communities*. University of Tennessee, Department of Ecology & Evolutionary Biology, Knoxville, TN, February 2016.
- Understanding and predicting the effects of global change on ecological communities*. University of North Carolina, Biology Department, Chapel Hill, NC, February 2016.
- Understanding and predicting the effects of global change on ecological communities: New approaches from theory and data science*. University of California Santa Barbara, Department of Ecology, Evolution, and Marine Biology, Santa Barbara, CA, January 2016.

- 2015 *Understanding and predicting the effects of global change on biodiversity.* Oregon State University, Department of Integrative Biology, Corvallis, OR, March 2015.
- Understanding and predicting the effects of global change on biodiversity across space and time.* Arizona State University, School of Life Sciences, Tempe, AZ, March 2015.
- 2013 *Conserving biodiversity with limited data: Insights from macroecology.* University of California Santa Cruz, Environmental Studies, Santa Cruz, CA, December 2013.
- Linking biodiversity loss to economic consumption with a global wildlife footprint.* University of California Berkeley, Energy and Resources Group, Berkeley, CA, October 2013.
- Practicing conservation with limited data: Insights from macroecology.* University of California Berkeley, Department of Environmental Science, Policy, Management, Berkeley, CA, September 2013.
- 2008 *Sustainability accounting with the ecological footprint.* University of California Berkeley, Geospatial Imaging and Informatics Facility, Berkeley, CA, March 2008.
- 2007 *Scenarios and options for reducing ecological overshoot.* Kyoto University, Kyoto, Japan, November 2007.
- National footprint accounting: Russia as a case study.* Doshisha University, Kyoto, Japan, March 2007.

Outreach and Public Presentations

- 2017 *Book Launch: The Practice of Reproducible Research.* Berkeley Institute for Data Science, January 2017. Organizer, Moderator, and Presenter.
- 2015 *Working Group on Open Science/Publishing.* Berkeley Institute for Data Science, November 2015. Organizer, Moderator, and Presenter.
- 2014 *Identifying the upstream drivers of biodiversity loss through a global wildlife footprint.* Wildlife Conservation Society, New York, NY, October 2014.
- 2011 *Bat ecology and conservation in human-dominated landscapes.* Pepperwood Preserve, Santa Rosa, CA, June 2011.
- 2010 *The ecological footprint.* University of California Berkeley, Beahrs Environmental Leadership Program, Berkeley, CA, June 2010.
- 2009 *The ecological footprint.* KÖVET Association for Sustainable Economies, Budapest, Hungary, October 2009.

- 2008 *Ecological footprint accounting in China*. Chinese Academy of Sciences, Beijing, China, January 2008.
- 2007 *Japan's national footprint accounts*. Mizuho Information and Research Institute, Tokyo, Japan, March 2007.
- 2006 Panelist and NGO representative. International Workshop on Ecosystem and Natural Capital Accounting, European Environment Agency, Copenhagen, Denmark, November 2006.
- Ecological footprint accounts: Measuring human demand on the biosphere*. United Nations, Commission on Sustainable Development 14th session, New York, NY, May 2006.
- Ecological footprint roundtable discussion*. Environment Agency Abu Dhabi, Abu Dhabi, United Arab Emirates. March 2006.
- 2005 *Ecological footprint accounting*. OECD Workshop on Sustainable Materials Management, Seoul, South Korea, November 2005.

TEACHING

Courses Taught

- 2013 University of California Berkeley, Energy and Resources Group, ER202
Modeling Ecological and Meteorological Phenomena
Graduate seminar, 15 students

Guest Lectures

- 2017 University of Pittsburgh, Biological Sciences BIOSC1540
University of Pittsburgh, Biological Sciences BIOSC2361
- 2015 University of California Berkeley, Energy and Resources Group ER202
- 2012 University of California Berkeley, Energy and Resources Group ER101
- 2007 University of California Berkeley, Enviro. Science, Policy, and Management C193A
University of California Berkeley, Earth and Planetary Sciences 80
Stanford University, Earth Systems 15SI
Stanford University, Biological Sciences 163H
- 2006 University of San Francisco, School of Business, Business Administration BA245
Stanford University, Earth Systems 100

Workshops and Training

- 2015 *Software Carpentry Two-Day Intensive Workshop*. Berkeley Institute for Data Science, Berkeley, CA, December 2015. Organizer and Lead Instructor.
- 2014 *Software Carpentry Two-Day Intensive Workshop*. Berkeley Institute for Data Science, Berkeley, CA, March 2014. Lead Instructor.
- Software Carpentry Two-Day Intensive Workshop*. University of California Berkeley, Energy and Resources Group, Berkeley, CA, January 2014. Organizer and Lead Instructor.
- Software Carpentry Two-Day Intensive Workshop*. University of California Santa Barbara, Bren School, Santa Barbara, CA, January 2014. Lead Instructor.
- Software Carpentry Two-Day Intensive Workshop*. Stanford University, School of Earth Sciences, Stanford, CA, January 2014. Co-Lead Instructor.
- 2013 *Software Carpentry Two-Day Intensive Workshop*. University of California Berkeley, Energy and Resources Group, Berkeley, CA, April 2013. Organizer and Lead Instructor.
- Software Carpentry Two-Day Intensive Workshop*. Lawrence Berkeley National Lab, Berkeley, CA, March 2013. Lead Instructor.
- 2012 *Software Carpentry Two-Day Intensive Workshop*. University of California Berkeley, Department of Statistics, Berkeley, CA, October 2012. Instructor.
- Software Carpentry Two-Day Intensive Workshop*. Lawrence Berkeley National Lab, Berkeley, CA, October 2012. Instructor.
- 2009 *Ecological Footprint Two-Day Technical Training*. WWF Belgium and Ecolife, Brussels, Belgium, May 2009. Lead Instructor.
- 2007 *Ecological Footprint Two-Day Technical Training*. BioRegional Development Group, Wallington, United Kingdom, May 2007. Lead Instructor.
- Ecological Footprint Two-Day Technical Training*. Ministry of the Environment, Japan, Oakland, CA, February 2007. Lead Instructor.
- 2006 *Ecological Footprint Technical Training*. International Footprint Forum 2006, Colle di Valle, Italy, June 2006. Lead Instructor.
- Ecological Footprint One-Day Teacher's Workshop*. Emirates Environmental Group, Dubai, United Arab Emirates, March 2006. Lead Instructor.

MENTORSHIP

Graduate Students

Lauren Schricker	Dissertation advisor, University of Pittsburgh	2018–
Michelle Spicer	Committee member, University of Pittsburgh	2018–
Tiffany Betras	Committee member, University of Pittsburgh	2018–

Undergraduate Students

Kyle Walters	Mathematics, University of Pittsburgh	2017–2018
Lydia Zimmerman	Biology, University of Pittsburgh	2018
Aaron Lauer	Biology, University of Pittsburgh	2018
Madoc Smith	Mathematical Biology, University of Pittsburgh	2018
James Dunn	Public health (thesis), UC Berkeley	2015–2016
Rochelle Kelly	Environmental science (thesis), UC Berkeley	2012–2013
Benjamin Wheeler	Environmental science (thesis), UC Berkeley	2011–2012

Staff

Tessa Rhinehart	Programmer II, University of Pittsburgh	2018
Mark Wilber	Associate specialist, UC Berkeley	2012

PROFESSIONAL ACTIVITIES

Manuscript Reviewer

American Naturalist
Basic and Applied Ecology
Biometrics
Conservation Biology
Conservation Letters
Earth's Future
Ecography
Ecological Economics
Ecological Modelling
Ecological Monographs
Ecology
Ecology and Evolution
Ecology Letters
Environmental Research Letters
F1000 Research
Global Ecology and Biogeography
Heredity
Journal of Biogeography

Journal of Environmental Management
Land Use Policy
Methods in Ecology and Evolution
Nature
Nature Scientific Reports
PLoS ONE
Theoretical Ecology

Grant Reviewer

Ad Hoc Reviewer, Natural Environment Research Council, UK 2017

University of Pittsburgh Committees and Service

Graduate School of Public Health, External Reader 2018
Department of Biological Sciences, Undergrad Research Committee 2017–2018

Other Service

Software Carpentry Foundation, Advisory Council 2015–2017
Ecological Society of America, Symposium Organizer 2014
Berkeley Institute for Data Science, Reproducibility Working Group 2014–2017
UNEP GEO-5 Report, Lead Author, Biodiversity chapter 2010–2012
Society for Conservation Biology, North American Congress Comm. 2010–2012
UC Berkeley Dept. of ESPM, Ecosystem Sciences Admissions Comm. 2010–2012
Society for Conservation Biology, Ecological Footprint Comm. 2008–2016