Carl Boettiger

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Employment

2022-Present Associate Professor, Department of Environmental Science, Policy and Management, **University of California, Berkeley.**

2015-2022 Assistant Professor, Department of Environmental Science, Policy and Management, **University of California, Berkeley.**

2013-2015 NSF Post-doctoral Scholar in the Department of Applied Mathematics and Statistics, **University of California, Santa Cruz**. Mentors: Marc Mangel, Stephan Munch

Education

2012 Ph.D Population Biology, **University of California, Davis**. Mentor: Alan Hastings

2007 A.B in Physics, **Princeton University**, with honors and certificates in *biophysics* and *applied and computational mathematics.*

Publications

1. James J. Wray, Neta A. Bahcall, Paul Bode, **Carl Boettiger**, Phillip Hopkins (2006). The Shape, Multiplicity, and Evolution of Superclusters in Lambda-CDM Cosmology, *The Astrophysical Journal* 652 (2) 907-916. doi:10.1086/50860. (preprint)

2. **Carl Boettiger**, Jonathan Dushoff, Joshua S Weitz (2010). Fluctuation domains in adaptive evolution, *Theoretical Population Biology* 77 (1) 6-13. doi:10.1016/j.tpb.2009.10.003. (preprint, code, data)

3. **Carl Boettiger**, Graham Coop, Peter Ralph (2012). Is your phylogeny informative? Measuring the power of comparative methods, *Evolution* 66 (7) 2240-51. doi:10.1111/j.1558-5646.2011.01574.x, (preprint, code, data)

4. Jeremy M. Beaulieu, Dwueng-Chwuan Jhwueng, **Carl Boettiger**, Brian O'Meara, (2012). Modeling Stabilizing Selection: Expanding the Ornstein-Uhlenbeck Model of Adaptive Evolution, *Evolution* 66 (8) 2369-2383. doi:10.1111/j.1558-5646.2012.01619.x (software)

5. **Carl Boettiger**, Alan Hastings (2012). Quantifying Limits to Detection of Early Warning for Critical Transitions, *Journal of the Royal Society: Interface* 9 (75) 2527-2539. doi:10.1098/rsif.2012.0125. (preprint, code)

6. **Carl Boettiger**, Duncan Temple Lang (2012). Treebase: An R package for discovery, access and manipulation of online phylogenies, *Methods in Ecology and Evolution* 3 (6) 1060–1066. doi:10.1111/j.2041-210X.2012.00247x. (code, software)

7. **Carl Boettiger**, Duncan Temple Lang, Peter Wainwright (2012). rfishbase: exploring, manipulating and visualizing FishBase data from R, *Journal of Fish Biology*. 81 (6) 2030–2039. doi:10.1111/j.1095-8649.2012.03464.x. (code, software)

8. **Carl Boettiger**, Alan Hastings (2012). Early Warning Signals and the Prosecutor's Fallacy, *Proceedings of the Royal Society B* 279 (1748) 4734-4739. doi:10.1098/rspb.2012.2085. (preprint, code, data)

9. **Carl Boettiger**, Alan Hastings (2013). Tipping points: From patterns to predictions, *Nature* 493, 157–158. doi:10.1038/493157a.

10. **Carl Boettiger**, Noam Ross, Alan Hastings (2013). Early warning signals: The charted and uncharted territories. *Theoretical Ecology* doi:10.1007/s12080-013-0192-6. (preprint, code)

11. **Carl Boettiger**, Alan Hastings (2013). No early warning signals for stochastic transitions: insights from large deviation theory. *Proceedings of the Royal Society B*. doi:10.1098/rspb.2013.1372. (preprint, code)

12. **Carl Boettiger**, Marc Mangel, Stephan Munch (2015). Avoiding tipping points in fisheries management through Gaussian process dynamic programming. *Proceedings of the Royal Society B* 282(1801), 8–11. doi:10.1098/rspb.2014.1631. (preprint, code, data). F1000 recommended

13. **Carl Boettiger** (2015). An introduction to Docker for reproducible research. *ACM SIGOPS Operating Systems Review* 49(1), 71-79. doi:10.1145/2723872.2723882. (preprint)

14. **Carl Boettiger**, Scott Chamberlain, Edmund Hart, Karthik Ram (2015). Building Software, Building Community: Lessons from the rOpenSci Project. *Journal of Open Research Software* 3: e8, doi:10.5334/jors.bu.

15. **Carl Boettiger**, Scott Chamberlain, Rutger Vos and Hilmar Lapp (2016). RNeXML: a package for reading and writing richly annotated phylogenetic, character, and trait data in R. *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.12469. (preprint, code, software)

16. **Carl Boettiger**, Michael Bode, James N. Sanchirico, Jacob LaRiviere, Alan Hastings, and Paul Robert Armsworth (2016). Optimal management of a stochastically varying population when policy adjustment is costly. *Ecological Applications* 26 (3) 808-817.
doi:10.1890/15-0236. (preprint, code)

17. T Alex Perkins, **Carl Boettiger**, Benjamin L. Philips. (2016) After the games are over: life-history trade-offs drive dispersal attenuation following range expansion. *Ecology and Evolution* 6 (18) 6425-6434. doi:10.1002/ece3.2314. (preprint, code)

18. Hampton, Jones, Wasser, Schuldhauer, Supp, Brun, Herandez, **Boettiger**, Collins, Gross, Fernandez, Budden, White, Teal, Labou, Aukema (2017). Skills and Knowledge for Data Intensive Research. *BioScience*. doi:10.1093/biosci/bix025. (preprint)

19. Ben Marwick, **Carl Boettiger**, Lincoln Mullen (2017). Packaging data analytical work reproducibly using R (and friends). *The American Statistician*. doi:10.1080/00031305.2017.1375986. (preprint)

20. Getz, Marshall, Carlson, Giuggioli, Ryan, Romañach, **Boettiger**, Chamberlain, Larsen, D'Odorico, O'Sullivan (2017). Making ecological models adequate. *Ecology Letters*. doi:10.1111/ele.12893

21. **Carl Boettiger** (2017). Generating Codemeta Metadata for R Packages.
The Journal of Open Source Software 2 (19), 454, doi:10.21105/joss.00454

22. **Carl Boettiger**, Dirk Eddelbuettel (2018). An Introduction to Rocker: Docker Containers for R. *The R Journal*. doi:10.32614/RJ-2017-065

23. **Carl Boettiger** (2018). From noise to knowledge: how randomness generates novel phenomena and reveals information. *Ecology Letters*. doi:10.1111/ele.13085 (preprint, code, data)

24. Milad Memarzadeh, **Carl Boettiger** (2018). Adaptive management of ecological systems under partial observability. *Biological Conservation*. 224, 9-15. doi:10.1016/j.biocon.2018.05.009. (software)

25. **Carl Boettiger** (2018). Managing Larger Data on a GitHub Repository. *Journal of Open Source Software*, 3(29), 971, doi:10.21105/joss.00971. (software).

26. Karthik Ram, **Carl Boettiger**, Scott Chamberlain, Noam Ross, Maelle Salmon, & Stephanie Butland (2018). A Community of Practice Around Peer-review for Long-term Research Software Sustainability. *Computing in Science & Engineering*, 9615(c), 1–1. doi:10.1109/MCSE.2018.2882753

27. Katz, Allen, Barba, Berg, Bik, **Boettiger**, et al. (32 co-authors.) (2018). The principles of tomorrow's university. *F1000Research*, 7:1926 doi:10.12688/f1000research.17425.1.

28. **Carl Boettiger** (2019). Ecological Metadata as Linked Data. *Journal of Open Source Software*, 4(34), 1276, doi:10.21105/joss.01276 (software).

29. Dan Sholler, Karthik Ram, **Carl Boettiger**, Daniel S Katz (2019). Enforcing public data archiving policies in academic publishing: A study of ecology journals. *Big Data & Society* 6(1) 1-18. doi:10.1177/2053951719836258. (preprinthttps://doi.org/10.48550/arXiv.1810.13040)

30. Milad Memarzadeh, **Carl Boettiger** (2019). Resolving the Measurement Uncertainty Paradox in Ecological Management. *American Naturalist*. doi:10.1086/702704. (preprint, code, data). F1000 recommended

31. **Carl Boettiger**, Ryan Batt (2019). Bifurcation or state tipping: assessing transition type in a model trophic cascade. *Journal of Mathematical Biology*. doi:10.1007/s00285-019-01358-z (preprint, code)

32. Milad Memarzadeh, Gregory L. Britten, Boris Worm, **Carl Boettiger** (2019). Rebuilding global fisheries under uncertainty. *Proceedings of the National Academy of Sciences*. doi:10.1073/pnas.1902657116

33. de Aguiar, Newman, Pires, Yeakel, **Boettiger**, Burkle, Gravel, Guimarães Jr, O'Donnell, Poisot, Fortin, Hembry (2019). Revealing biases in the sampling of ecological interaction networks, *PeerJ*, doi:10.7717/peerj.7566. (software).

34. **Carl Boettiger** (2020). Ecological management of stochastic systems with long transients. *Theoretical Ecology*. doi:10.1007/s12080-020-00477-4, (code)

35. Kari Norman, Scott Chamberlain, **Carl Boettiger** (2020). taxadb: A high-performance local taxonomic database interface. *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.13440 (software)

36. Pascal, Memarzadeh, **Boettiger**, Lloyd, Chadès (2020). A Shiny r app to solve the problem of when to stop managing or surveying species under imperfect detection *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.13501 (software)

37. **Carl Boettiger** (2020). [Rp] Fluctuation domains in adaptive evolution. ReScience C 6, 1, #15, doi:10.5281/zenodo.4081202, (pdf, code)

38. Caleb Scoville, Melissa Chapman, Razvan Amironesei, **Carl Boettiger** (2021). Algorithmic conservation in a changing climate. *Current Opinion in Environmental Sustainability* 51, 30-35, doi:10.1016/j.cosust.2021.01.009.

39. Reimer, Arroyo-Esquivel, Jiang, Scharf, Wolkovich, Zhu, **Boettiger** (2021). Noise can create or erase long transient dynamics. *Theoretical Ecology* doi:10.1007/s12080-021-00518-6, (code, data)

40. Karatayev, Baskett, Kushner, Shears, Caselle, **Boettiger** (2021). Grazer behavior can regulate large-scale patterning of community states. *Ecology Letters* doi:10.1111/ele.13828 (preprint)

41. Chapman, Oestreich, Frawley, **Boettiger**, Diver, Santos, Scoville, Armstrong, Blondin, Chand, Haulsee, Knight, Crowder (2021). Promoting equity in the use of algorithms for high seas conservation. *One Earth* doi:10.1016/j.oneear.2021.05.011, (preprint, code)

42. Lapeyrolerie, **Boettiger**. (2021) Teaching machines to anticipate catastrophes. *Proceedings of the National Academy of Sciences* doi:10.1073/pnas.2115605118

43. Chapman, Scoville, Lapeyrolerie, **Boettiger**. (2021). Power and Accountability in Reinforcement Learning Applications to Environmental Policy. *35th Conference on Neural Information Processing Systems (NeurIPS 2021)* (preprint, pdf)

44. Chapman, Wiltshire, Baur, Bowles, Carlisle, Castillo, Esquivel, Gennet, Iles, Karp, Kremen, Liebert, Olimpi, Ory, Ryan, Sciligo, Thompson, Waterhouse, **Boettiger**. (2022). Social-ecological feedbacks drive tipping points in farming system diversification. *One Earth* doi:10.1016/j.oneear.2022.02.007 (preprint, code)

45. **Boettiger** (2022). The Forecast Trap. *Ecology Letters* 25, 1655-1664, doi:10.1111/ele.14024 (preprint, code)

46. Lapeyrolerie, Chapman, Norman, **Boettiger** (2022). Deep Reinforcement Learning for Conservation Decisions. *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.13954 (preprint, code)

47. Laperoleryie, **Boettiger**. (2022). Limits to Ecological Forecasting: Estimating Uncertainty for Critical Transitions with Deep Learning. *Methods in Ecology and Evolution*. doi:10.1111/2041-210X.14013 (preprint, code)

48. Benjamin S. Halpern, **Carl Boettiger**, Michael C. Dietze, Jessica A. Gephart, Patrick Gonzalez, Nancy B. Grimm, et al. (116 co-authors). (2023). Priorities for synthesis research in ecology and environmental science. *Ecosphere*. doi:10.1002/ecs2.4342

49. Chapman, **Boettiger**, Brashares. (2023). Leveraging private land conservation to meet 2030 biodiversity targets in the United States. *Conservation Science and Practice*. doi:10.1111/csp2.12897 (preprint, code)

50. Thomas, **Boettiger**, Carey, Dietze, Johnson, Kenney, Mclachlan, Peters, Sokol, Weltzin, Willson, Woelmer, and Challenge Contributors (2023). The NEON Ecological Forecasting Challenge. *Frontiers in Ecology and the Environment*. 21, (3) pp 112-113. doi:10.1002/fee.2616 (preprint)

51. Sydne Record, **Carl Boettiger** and Christine R Rollinson. (2023). Synthesizing forecasts to inform decision-making and advance ecological theory. *Methods in Ecology and Evolution*, 14: 728-731. doi:10.1111/2041-210X.14070

52. Thomas, McClure, Moore, Woelmer, **Boettiger**, Figueiredo, Hensley, Carey (2023). Near-term forecasts of NEON lakes reveal gradients of environmental predictability across the U.S. *Frontiers in Ecology and the Environment*. 21, (5) pp 220-226. doi:10.1002/fee.2623 (preprint, code, data)

53. Melissa Chapman, Lily Xu, Marcus Lapeyrolerie & **Carl Boettiger** (2023). Bridging adaptive management and reinforcement learning for more robust decisions. *Philosophical Transactions of the Royal Society B* 378, 2022-0195, doi:10.1098/rstb.2022.0195. (preprint)

54. David Moreau, Krisina Wiebels, & **Carl Boettiger**. (2023). Containers for computational reproducibility. *Nature Reviews Methods Primers* 3, (50). doi:10.1038/s43586-023-00236-9

55. Montealegre-Mora, Lapeyrolerie, Chapman, Keller, **Boettiger**. (2023). Pretty Darn Good Control: When are Approximate Solutions Better than Approximate Models. *Bulletin of Mathematical Biology*. doi:10.1007/s11538-023-01198-5 (preprint, code)

56. Dietze, Thomas, Peters, Boettiger, Koren, Shiklomanov, Ashander. (2023). A community convention for ecological forecasting: Output files and metadata version 1.0 *Ecosphere* 14(11). doi:10.1002/ecs2.4686

57. Chapman, Goldstein, Schell, Brashares, Carter, Ellis-Soto, Faxon, Goldstein, Halpern, Longdon, Norman, O'Rourke, Scoville, Xu, **Boettiger**. (2024). Biodiversity monitoring for a just planetary future. *Science* 383,34-36(2024). doi:10.1126/science.adh8874

Book Chapters

Carl Boettiger (2017). A Reproducible R Notebook Using Docker. In J. Kitzes, D. Turek, & F. Deniz (Eds.), The Practice of Reproducible Research: Case Studies and Lessons from the Data-Intensive Sciences (1st ed., pp. 109–117). Oakland, CA: UC Press. https://www.ucpress.edu/book.php?isbn=9780520294752

Scoville, Faxon, Chapman, Fried, Xu, **Boettiger**, Reed, Lapeyrolerie, Van Scoyoc, Amironesei. (2023). Environment, Society, and Machine Learning. In *The Oxford Handbook of the Sociology of Machine Learning*, C. Borch & JP. Pardo-Guerra (eds.) doi:10.1093/oxfordhb/9780197653609.013.8

Grants

The Eric and Wendy Schmidt Center for Data Science and Environment. (2023-2028) Douglas McCauley, Fernando Perez, Justin Brashares, Carl Boettiger Total: $12.6M.

Examining Environmental Justice through Open Source, Cloud Native Tools. **NASA National Aeronautics and Space Administration** (2022-2025). UCB Award ID: 055956-001. Carl Boettiger, PI. Total: $134,596.

Collaborative Research: Frameworks: DeCODER (Democratized Cyberinfrastructure for Open Discovery to Enable Research). (2022-2026) **National Science Foundation** #OAC-2209865, UCB sub-award ID: 054904-001; PI $102,984

A decision framework for managing European Green Crab infestations on the coast of Washington and Salish Sea shorelines. **US Geological Survey** (2022 - 2025). UCB Award ID: 054356-001. Carl Boettiger, PI. Total: $174,577.

CAREER: Harnessing the data revolution for predicting and managing ecosystem regime shifts. Carl Boettiger. (2020-2025). **National Science Foundation** #DBI-1942280. $504,335.00

The Rocker Project. Carl Boettiger, Noam Ross, Dirk Eddelbuettel. (2019 - 2021). **Chan-Zuckerberg Initiative**: Essential Open Source Software for Science. $75,912

The Influence of Conflicting Policies and Supply-Chain Pressures on Farmers' Decisions and Tradeoffs with Respect to Biodiversity, Profitability, and Sustainability. Timothy Bowles (PI), Alastair Iles, Claire Kremen, Carl Boettiger. (2018-2022). **National Science Foundation** #CNH-1824871 $1,301,737

The rOpenSci Project. Karthik Ram, Carl Boettiger, Scott Chamberlain. (renewal, 2019-2021). **Helmsley Charitable Trust**, award 2016PG-BRI004. $1,000,000

Detecting Change in Global Biodiversity through Large Scale Network Analysis. Carl Boettiger, Rosemary Gillespie, Rasmus Nielsen. (2018). Berkeley Institute for Data Science, $67,000

Big Data, Big Uncertainty: Ecological Decision- Making in the 21st Century. (2018-2020). Hellman Fellows Award, **The Hellman Foundation**. $37,600

Berkeley Collegium Award for Narrowing the Gap Between Teaching and Research. (2018-2019) $16,867.50

Managing ecosystems under extreme uncertainty. (2016 - 2019) NSF **XSEDE** TG-DEB160003. NSF Estimated value of computing resources: $34,558

Reproducible and Collaborative Data Science. NSF **XSEDE** TG-DEB160021. (2016 - 2019) NSF Estimated value of computing resources: $20,028

James S McDonnell Foundation Post-doctoral Fellowship in Complex Systems (Awarded to post-doctoral scholar Allison Barner, who then chose to bring this award to my group at UC Berkeley) $200,000.

The rOpenSci Project (2015-2018, Co-PI). Karthik Ram, Carl Boettiger, Scott Chamberlain. **Helmsley Charitable Trust**, award 2016PG-BRI004. $2,875,071

The CodeMeta Project (2015). **National Science Foundation** #ACI-1549758 *$165,782*. (proposal link)

The rOpenSci Project, Phase II funding (2014, Co-PI). Karthik Ram, Carl Boettiger, Scott Chamberlain. **Alfred P. Sloan Foundation** $300,000

NSF Biology Post-doc (2013-2015). **National Science Foundation** #DBI-1306697, $138,000 (proposal link)

The rOpenSci Project Phase I funding (2013 Co-PI). Karthik Ram, Carl Boettiger, Scott Chamberlain. **Alfred P. Sloan Foundation** $180,000

IIASA YSSP fellowship (2009). **National Academy of Sciences**, OISE-0738129, $8,000. (proposal link)

Computational Science Graduate Fellowship (2008). **United States Department of Energy**, #DE-FG02-97ER25308, $149,000. (proposal link)

Teaching

ESPM-157: Data Science for Global Change Ecology. UC Berkeley. Upper-division undergraduate course, 4 units. Offered every Fall.

ESPM-288: Reproducible and Collaborative Data Science. UC Berkeley. Graduate-level course, 3 units. Offered every Spring.

ESPM-88B: Data Science in Ecology and the Environment. UC Berkeley. Freshman level Data-8 connector; not currently offered.

Invited Talks & Workshops

2023

Bezos Earth Fund AI for Climate and Nature Workshop, San Francisco, CA (recording)
Invited seminar speaker, University of Southern California, Biology Department, CA
Invited seminar speaker, University of California, Davis, Department of Mathematics, CA
Invited seminar speaker, Virginia Polytechnic Institute and State University (Virginia Tech), VA
Invited workshop speaker, Critical Transitions, Princeton University, NJ
Invited seminar speaker, Data Sciences, University of New South Wales, Sydney, Australia
Invited talk, Gordon Conference on Predictive Ecology, Stonehill College, MA
Co-organizer, Ecological Forecasting Unconference, NEON Headquarters, Boulder, CO
Invited workshop speaker, Australian Mathematical Sciences (AMSI) Winter School, Brisbane, Australia
Invited seminar speaker, University of Queensland, Brisbane, Australia
Ecological Society of America, contributed talk, Portland OR
GEO BON Global Conference: Monitoring Biodiversity for Action, Montreal, Canada.
California Academy of Natural Sciences Past, Present, Future Biodiversity Convening, San Francisco, CA

2022

Ecological Forecasting Initiative workshop (online)
Invited speaker, International Institute of Applied Systems Analysis (IIASA) conference, Boston University, Boston MA.

2021

Workshop on the Future of Synthesis, National Center for Ecological Analysis and Synthesis (co-organizer).
National Ecological Observatory Network (NEON) Workshop on Complex Landscapes at Scale.
Ecological Forecasting Initiative (EFI) Workshop on Empowering Development of the Next Generation of Educational Materials for Forecasting.

2020

Invited seminar speaker, University of Oregon, Eugene, OR.

Chan-Zuckerberg Initiative Essential Open Source Software for Science Workshop.
Invited seminar speaker, DataONE data repository network.
Ecological Forecasting Initiative Research Coordination Network Workshop.
Invited seminar speaker, Concordia University, Montreal, CA.

2019

Invited Biodiversity Research Center seminar speaker, University of British Columbia, Vancouver, Canada.
Ecological Forecasting Oral Session, American Geophysical Union, San Fransisco, CA.
Advancing Theory in Ecology, NSF Workshop. Pennsylvania State University, State College, PA.
Biodiversity Data Workshop, invited speaker, Arizona State University, Tempe, AZ.
Transients in Ecology, Organized Oral Session, Ecological Society of America Annual Meeting, Louisville, KY.
Ecological Forecasting Initiative Conference, AAAS Headquarters, Washington DC.
NIMBioS Transient Dynamics Workshop, University of Tennessee, Knoxville, TN.
Project EDDIE keynote speaker, Carlton College, Northfield MN.
US Research Software Sustainability Institute Workshop, NCEAS, Santa Barbara, CA.
COMPASS Workshop for scientific communication, Asilomar, CA.

2018

NSF SI2 PIs Meeting, Washington, DC.
rOpenSci unconference, Seattle, WA.
Faculty Learning Program Fellows Workshop Berkeley, CA.
GraphXD, Berkeley, CA.
Digital Data in Biodiversity UC Berkeley. (co-organizer)
Ecological Society of America Invited Symposium Addressing Outstanding Challenges to Operationalizing Resilience (Organizer). New Orleans, LA.
Nonlinear Forecasting for Fisheries Applications, NOAA Southwest Fisheries Science Center, Santa Cruz, CA.

2017

CROSS Symposium Speaker Santa Cruz, CA.
Imagining Tomorrow's University Chicago, IL.
rOpenSci unconference, Los Angeles, CA.
Prov-a-thon: Practical Tools for Reproducible Science, Tamaya, NM.
NSF Translational Data Science Workshop, Berkeley Institute for Data Science, Berkeley, CA.

2016

Force16 Codemeta Workshop, Portland OR (organizer).
CodeMeta NSF Workshop Portland, OR (organizer).
rOpenSci unconference, San Francisco, CA.

2015

Empirical Dynamical Modeling and Forecasting in Nonlinear Systems, NTU, Taiwan.
Moore-Sloan Data Science Environments: Second Annual Data Science Summit (Workshop)
Data Intensive Training Workshop, NCEAS, Santa Barbara, CA.
NSF Big Data Hubs Design Charette, Western Region.
rOpenSci unconference, San Francisco CA.
Pretty Darn Good Control Working group, NIMBIOS, Knoxville TN.

2014

Berkeley Initiative for Global Change Biology Workshop (student organized), UC Berkeley, CA.
DIMACS Global Change, Berkeley CA.
Zoology Seminar, University of Wisconsin, Madison, WI.
ESPM Seminar, UC Berkeley, CA.
rOpenSci unconference, San Francisco CA.
Reproducible Science: Curriculum & Workflow Workshop, NESCent, Durham, NC.
WSSSPE 2.0 Meeting. New Orleans, LA.
Workflows Working Group, NCEAS, Santa Barbara, CA.

2013 & prior

invited speaker, MBI, Sustainable Management of Living Natural Resources, Columbus, OH.
invited seminar speaker, WHOI, Woods Hole, MA.
invited seminar speaker, UC Davis Dept of Environmental Resources and Economics; Davis, CA.
invited speaker, SSB Symposium, Evolution Conference, Ottawa, CAN.
Sustainable Management of Living Natural Resources Workshop, MBI Columbus, OH.
Academic software & workforce development Workshop, ISEES. Oakland, CA.
Software Lifecycle Workshop, ISEES, Santa Barbara, CA.
Pretty Darn Good Control Working group, NIMBIOS, Knoxville, TN.
Stochastic spatial modeling in population dynamics Workshop, AIM, Palo Alto, CA.

Awards

2020 CAREER Award, National Science Foundation
2020 Early Career Fellow, Ecological Society of America
2020 Winkler Family Foundation Scholar
2018 Hellman Fellow, Hellman Foundation
2011 Volterra Award, Ecological Society of America, Theory Section
2007 Elected to Membership in the Society of Sigma Xi
2007 Allen G. Shenstone Prize in Physics, Princeton University
2007 The Class of 1870 Old English Prize, Princeton University
2006 Kusaka Memorial Prize in Physics, Princeton University

Service & Outreach

Campus

2023 - 2024. RCNR Public-Private Partnership Proposals

2023 - 2024. CDSS College Regulations Proposal Task Force

2023 - current. Masters in Climate Solutions design team

2018 - current. Governance Committee for Data Science Programs

1. Faculty Working Group for the formation of the Division of Data Science & Information

2018 - 2019. Faculty Task Force for Data Science Minor Design

2018 - 2019. Faculty Advisory Committee of the Vice Chancellor for Undergraduate Education

2017 - 2018. ESPM Remote Sensing Faculty Search, committee member & equity liaison

2017 - 2018. ad hoc Data Science Degree Proposal Committee

2017 - 2020. Steering Committee for NSF Research Traineeship (NRT): Environment and Society: Data Science for the 21st Century (DS421)

2015 - 2019. Berkeley Research Computing Advisory Committee

National / International

2021 - current Faculty co-advisor and co-founder, Eric and Wendy Schmidt Center for Data Science and Environment, UC Berkeley.

2023 - current. NSF Synthesis Center Environmental Data Science Innovation & Inclusion Lab (ESIIL) Advisory Board Member.

2019 - current. Associate Editor, *Ecology Letters*

2010 - current. rOpenSci Leadership Team

2014 - 2020. NCEAS Scientific Advisory Board

2014 - current. Rocker Project co-maintainer

2016 - 2019. Jetstream Cloud Computing Stakeholder Advisory Board, XSEDE.

Reviewer for over 40 journals, NSF review panelist, ad hoc reviewer for UC CCGA, NSF, NERSC.

Software

R Packages (on CRAN)

`duckdbfs` High Performance Remote File System, Database and Geospatial Access Using duckdb. Carl Boettiger (2023).

`earthdatalogin` NASA EarthData Access Utilities. Carl Boettiger, Luis López, Yuvi Panda, Brianna Lind (2023).

`minioclient`: A High Performance Interface to S3-based Object Stores. Carl Boettiger (2023).

`gbifdb`: A High Performance Interface to GBIF. Carl Boettiger (2022).

`neonstore`: A Fast and Provenance Aware Local NEON Data Store.
Carl Boettiger, Quinn Thomas, Christine Laney, Claire Lunch (2020).

`contentid`: An Interface for Content-Based Identifiers. Carl Boettiger and Jorrit Poelen (2020).

`taxalight`: A Lightweight and Lightning-Fast Taxonomic Naming Interface. Carl Boettiger and Kari Norman (2020)

`sarsop`: Approximate POMDP Planning Software. Carl Boettiger and Jeroen Ooms and Milad Memarzadeh (2020).

`taxadb`: A High-Performance Local Taxonomic Database Interface. Carl Boettiger and Kari Norman and Jorrit Poelen and Scott Chamberlain, (2020).

`emld`: Ecological Metadata as Linked Data. Carl Boettiger (2019).

`virtuoso`: Interface to Virtuoso using ODBC. Carl Boettiger (2019).

`rdflib`: Tools to Manipulate and Query Semantic Data. Carl Boettiger (2018).

`codemetar`: Generate CodeMeta Metadata for R Packages. Carl Boettiger, Maëlle Salmon (2018).

`EcoNetGen`: Simulate and Sample from Ecological Interaction Networks. Marcus de Aguiar, Erica Newman, Mathias Pires, Carl Boettiger (2018).

`piggyback`: Managing Larger Data on a GitHub Repository. Carl Boettiger (2018).

`arkdb`: Archive and Unarchive Databases Using Flat Files. Carl Boettiger (2018).

`EML`: Read and Write Ecological Metadata Language File. Carl Boettiger, Matt Jones (2016; v2 2019).

`RNeXML`: Semantically Rich I/O for the NeXML Phylogenetics Format. Carl Boettiger, Scott Chamberlain, Hilmar Lapp, Rutger Voss (2014).

`pmc`: Phylogenetic Monte Carlo. Carl Boettiger (2012).

`knitcitations`: Citations for Knitr Markdown Files. Carl Boettiger (2012).

`rfishbase`: R Interface to FishBase. Carl Boettiger, Scott Chamberlain, Duncan Temple Lang, Peter Wainwright (2011; v2 2015; v3 2019).

Python Modules (on PyPi)

`gym_fishing`: A Simulation Environment for Deep Reinforcement Learning for sustainable fisheries management. Carl Boettiger and Marcus Lapeyrolerie (2021).

`gym_conservation` A Simulation Environment for Deep Reinforcement Learning for conservation scenarios. Carl Boettiger (2021)

Other Software

Carl Boettiger, Dirk Eddelbuettel. The Rocker Project: Docker images for the R environment. `https://rocker-project.org`. (Language: Dockerfile)

Carl Boettiger, Matt Jones, et al. The CodeMeta Project: Software Metadata Exchange `https://codemeta.github.io` (Language: JSON-LD)

Media interviews

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Updated January 12, 2024