

# Carl Boettiger

ESPM Department, University of California, 130 Mulford Hall #3114  
Berkeley, CA 94720 – USA

✉ cboettig@berkeley.edu • 🌐 <http://carlboettiger.info> • 🐦 cboettig  
🔗 cboettig • orcid: 0000-0002-1642-628X

## employment

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2015-current 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

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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

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18. Hampton, Jones, Wasser, Schuldhaer, Supp, Brun, Hernandez, **Boettiger**, Collins, Gross, Fernandez, Budden, White, Teal, Labou & Aukema. (2017) Skills and Knowledge for Data Intensive Research. *BioScience*. doi:10.1093/biosci/bix025. (oa)
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. (oa, code)
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. (oa, code)
15. **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.
14. **Carl Boettiger**, Scott Chamberlain, Rutger Vos and Hilmar Lapp. (2015) 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. (oa, code, software)
13. **Carl Boettiger**. (2015) An introduction to Docker for reproducible research. *ACM SIGOPS Operating Systems Review, Special Issue on Repeatability and Sharing of Experimental Artifacts*. 49(1), 71-79. doi:10.1145/2723872.2723882. (oa)
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. (oa, code, data)
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. (oa, code)

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. (oa, code)
9. **Carl Boettiger**, Alan Hastings (2013). Tipping points: From patterns to predictions, *Nature* 493, 157–158. doi:10.1038/493157a.
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. (oa, code, data)
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. (oa, code, software)
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. (oa, code, software)
5. **Carl Boettiger** and 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. (oa, code)
4. Jeremy M. Beaulieu, Dwieng-Chwuan Jhvueng, **Carl Boettiger** and 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)
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, (oa, code, data)
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. (oa, code, data)
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. (oa)

## grants

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The rOpenSci Project (2015–2018, Co-PI). Helmsley Trust 2,900,000 USD.

The Codemeta project (2015). National Science Foundation #ACI-1549758 165,782 USD. (proposal)

The rOpenSci Project, Phase II funding (2014, Co-PI). Alfred P. Sloan Foundation 300,000 USD.

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

The rOpenSci Project Phase I funding (2013, Co-PI). Alfred P. Sloan Foundation 180,000 USD.

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

Computational Science Graduate Fellowship (2008). Department of Energy, #DE-FG02-97ER25308, 149,000 USD. (proposal)

## book chapters

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*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. Retrieved from <https://www.ucpress.edu/book.php?isbn=9780520294752>

## invited talks

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2015.....

Empirical Dynamical Modeling and Forecasting in Nonlinear Systems, NTU, Taiwan.

2014.....

Berkeley Initiative for Global Change Biology (student organized), UC Berkeley, CA.  
DIMACS Global Change, Berkeley CA.  
Zoology Seminar, University of Wisconsin, Madison, WI.  
ESPM Seminar, UC Berkeley, CA.

2013 & prior.....

MBI speaker, Sustainable Management of Living Natural Resources, Columbus, OH.  
WHOI Seminar speaker, Woods Hole, MA.  
UC Davis Dept of Environmental Resources and Economics; Davis, CA.  
SSB Symposium speaker, Evolution Conference, Ottawa, CAN.

## invited workshops

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2017.....

Imagining Tomorrow's University Chicago, IL.  
rOpenSci unconference, Los Angeles, CA  
Prov-a-thon: Practical Tools for Reproducible Science, Tamaya, New Mexico

2016.....

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

2015.....

Moore-Sloan Data Science Environments: Second Annual Data Science Summit  
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.....

rOpenSci unconference, San Francisco CA.  
Reproducible Science: Curriculum & Workflow, NESCent, Durham, NC.  
WSSSPE 2.0. New Orleans, LA.  
Workflows Working Group, NCEAS, Santa Barbara, CA.

2013 & prior.....

Sustainable Management of Living Natural Resources, MBI Columbus, OH.  
Academic software & workforce development, ISEES. Oakland, CA.  
Software Lifecycle, ISEES, Santa Barbara, CA.  
Pretty Darn Good Control Working group, NIMBIOS, Knoxville, TN  
Stochastic spatial modeling in population dynamics, AIM, Palo Alto, CA.

## awards

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2011 *Volterra Award* (Best student talk, ESA 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  
2006 Plasma Physics Fellow, PPPL

## service

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### national.....

NCEAS Scientific Advisory Board  
rOpenSci Leadership team  
Jestream NSF cloud computing Stakeholder Advisory Board

### campus.....

2017 - current. UC Berkeley Data Science Degree proposal Committee  
2015 - current. UC Berkeley, Berkeley Research Computing Advisory Committee

### reviewer for:.....

2017 National Science Foundation, Nature Climate Change, Nature Ecology & Evolution, Proceedings of the Royal Society B, rOpenSci Onboarding.

2016 Bioscience, National Science Foundation

**2015** Proceedings of the National Academy of Sciences, Journal of Statistical Software, Bioinformatics, Chapman & Hall, Ecology Letters, Ecology, PeerJ, F1000 Research, Journal of Librarianship & Scholarly Communication, Nature Communications, Theoretical Ecology, Trends in Ecology & Evolution, Grid Computing

**2014** Theoretical Ecology, Biodiversity Data Journal, Ecology Letters, Journal of Theoretical Biology, American Naturalist, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B

**2013** Theoretical Ecology, Francis & Taylor, Ideas in Ecology and Evolution, The R Journal, National Science Foundation, Proceedings of the Royal Society B, Journal of Open Research Software, Canadian Journal of Fisheries and Aquatic Sciences

**2012** Theoretical Ecology, Evolution, Methods in Ecology and Evolution, Proceedings of the Royal Society B, PLoS ONE, Ecology, Conservation Letters, Ecology Letters

**2011** Theoretical Ecology, Ecological Modelling, Evolution, Methods in Ecology and Evolution, Ecosphere

**2010 & prior** Theoretical Ecology, Journal of Mathematical Biology, Ecological Modelling, Ecology

## selected software

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Carl Boettiger, Dirk Eddelbuettel. The Rocker Project.

Carl Boettiger, Scott Chamberlain, Rutger Vos and Hilmar Lapp. (2015) RNeXML: a package for reading and writing richly annotated phylogenetic, character, and trait data in R. On [software](#)

Carl Boettiger (2013). knitcitations: Dynamic citations for dynamic documents. On [software](#).

Carl Boettiger, Scott Chamberlain, Karthik Ram, Edmund Hart (2013). rfigshare: Programmatic access to the figshare data repository. On [software](#).

Carl Boettiger (2012). pmc: Phylogenetic Monte Carlo. On [software](#).

Carl Boettiger (2011). rfishbase: Programmatic access to FishBase. On [software](#).

I am also a founding member of the rOpenSci project. My software impact is also measured relative to other academics by [depsy.org](#)

## theses

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- Carl Boettiger, David Huse (2006) Clonal Interference Models in Population Genetics. *Princeton Physics Dept.* doi:10.6084/m9.figshare.678305.
- Carl Boettiger, Joshua Weitz, Simon Levin (2007) Adaptive Dynamics: Branching Phenomena and the Canonical Equation *Princeton Physics Dept.* doi:10.6084/m9.figshare.678306.
- Carl Boettiger, Stephen Pacala, David Huse (2007) Ensemble Behavior from Individual Dynamics in Multispecies Forest Populations. *Princeton Physics Dept.* doi:10.6084/m9.figshare.678304.
- Carl Boettiger (2012). Regime shifts in ecology and evolution (PhD Dissertation). doi:10.6084/m9.figshare.97218.

## media interviews

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- Seltenrich, N. (2016). "Scaling the Heights of Data Science." *Breakthroughs Magazine*. <https://nature.berkeley.edu/breakthroughs/opensci-data>
- Tachibana, C. (2014). "The paperless lab" *Science* 345(6195) pp. 468-470. doi:10.1126/science.opms.p1400087
- Mascarelli, A. (2014) "Research tools: Jump off the page." *Nature* 507, 523-525. doi:10.1038/nj7493-523a
- Check Hayden E (2013). "Mozilla Plan Seeks to Debug Scientific Code." *Nature*, 501, pp. 472-472. doi:10.1038/501472a
- Van Noorden R (2013). "Data-Sharing: Everything on Display." *Nature*, 500, pp. 243-245. doi:10.1038/nj7461-243a
- Gewin, Virginia (2013). "Turning Point: Carl Boettiger" *Nature*, 493 p 711 doi:10.1038/nj7434-711a
- Wald, Chelsea (2010). "Scientists Embrace Openness" *Science*. doi:10.1126/science.caredit.a1000036