

Matthew Pennell

Assistant Professor

Canada Research Chair
in Biodiversity Theory and
Informatics

Department of Zoology
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Academic Positions

University of British Columbia, Vancouver, BC Canada | July 2016-present

Assistant Professor, Department of Zoology
Canada Research Chair (Tier II) in Biodiversity Theory and Informatics

University of British Columbia, Vancouver, BC Canada | July 2015–July 2016

Izaak Killam Memorial and NSERC Postdoctoral Fellow, Department of Zoology
Supervisor: Dr. Sally Otto

National Evolutionary Synthesis Center, Durham NC | Aug 2012–Dec 2012

Graduate Fellow

University of Idaho, Moscow, ID | Aug 2010–May 2015

Research Assistant
Major Supervisor: Dr. Luke Harmon

Education

University of Idaho, Moscow, ID | Aug 2010–May 2015

Ph.D. in Bioinformatics and Computational Biology
Dissertation title: Modeling the dynamics of phenotypic diversity across deep time
Major Supervisor: Dr. Luke Harmon

Simon Fraser University, Burnaby, BC Canada | Sept 2005–May 2010

B.Sc. Honours in Biological Sciences
Dissertation title: Measuring the two-fold cost in natural populations of *Timema*
Major Supervisor: Dr. Bernie Crespi

Publications

Schluter, D. and **M.W. Pennell**. In press. Speciation gradients and the distribution of biodiversity. *Nature*.

F. Mazel, A. Mooers, G.V.D. Riva, and **M.W. Pennell**. In press. Preserving phylogenetic diversity can be a poor strategy for preserving functional diversity. *Systematic Biology*

M.W. Pennell and M.I. O'Connor. In press. A modest proposal for unifying macroevolution and ecosystem ecology. *The American Naturalist*.

Uyeda, J.C., **M.W. Pennell**, E.T. Miller, R. Maia, and C.R. McClain. In press. The evolution of energetic scaling across the vertebrate tree of life. *The American Naturalist*.

Osmond, M.M., M.A. Barbour, J.R. Bernhardt, **M.W. Pennell**, J.M. Sunday, and M.I. O'Connor. 2017. Warming induced changes to body size stabilize consumer-resource dynamics. *The American Naturalist* DOI:10.1086/691387.

Pennell, M.W., R.G. FitzJohn, and W.K. Cornwell. 2016. A simple approach for maximizing the overlap of phylogenetic and comparative data. *Methods in Ecology & Evolution* 7:751-758.

Tank, D.C., J.M. Eastman, **M.W. Pennell**, P.S. Soltis, D.E. Soltis, C.E. Hinchliff, J.W. Brown, E.B. Sessa, and L.J. Harmon. 2015. Nested radiations and the pulse of angiosperm diversification. *New Phytologist* 207:454-467.

Pennell, M.W., R.G. FitzJohn, W.K. Cornwell, and L.J. Harmon. 2015. Model adequacy and the macroevolution of angiosperm functional traits. *The American Naturalist* 186: E33-E50.

Pennell, M.W., M. Kirkpatrick, S.P. Otto, J.C. Vamosi, C.L. Piechel, N. Valenzuela, and J. Kitano. 2015. Y fuse? Sex chromosome fusions in fishes and reptiles. *PLoS Genetics* 11:e1005237

Uyeda, J.C., D.S. Caetano, and **M.W. Pennell**. 2015. Comparative analysis of principal components can be misleading. *Systematic Biology* 64:677-689.

Pennell, M.W. 2015. Modern Phylogenetic Comparative Methods and Their Application in Evolutionary Biology: Concepts and Practice.—Edited by László Zsolt Garamszegi (Book Review). *Systematic Biology* 64:161-163.

FitzJohn, R.G., **M.W. Pennell**, A.E. Zanne, P.F. Stevens, D.C. Tank, and W.K. Cornwell. 2014. How much of the world is woody? *Journal of Ecology* 102:1266-1272.

Lanfear, R. and **M.W. Pennell**. 2014. Open access is worth considering. *Trends in Plant Sciences* 19:340-341.

The Tree of Sex Consortium; T. Ashman, D. Bachtrog, H. Blackmon, E.E. Goldberg, M.W. Hahn, M. Kirkpatrick, J. Kitano, J.E. Mank, I. Mayrose, R. Ming, S.P. Otto, C.L. Peichel, **M.W. Pennell**, N. Perrin, L. Ross, N. Valenzuela, and J.C. Vamosi. 2014. Tree of Sex: a database of sexual systems. *Scientific Data* 1:140015.

Stansbury, C.R., D.E. Ausband, P. Zager, C.M. Mack, C.R. Miller, **M.W. Pennell**, and L.P. Waits. 2014. A long term population monitoring approach to a wide-ranging carnivore: noninvasive genetic sampling of gray wolf rendezvous sites in Idaho, U.S.A. *Journal of Wildlife Management* 78:1040-1049.

Pennell, M.W., J.M. Eastman, G.J. Slater, J.W. Brown, J.C. Uyeda, R.G. FitzJohn, M.E. Alfaro, and L.J. Harmon. 2014. geiger v2.0: an expanded suite of methods for fitting macroevolutionary models to phylogenetic trees. *Bioinformatics* 15:2216-2218.

Slater, G.J. and **M.W. Pennell**. 2014. Robust regression and posterior predictive simulation increase power to detect early bursts of trait evolution. *Systematic Biology* 63:293-308.

Cornwell, W.K., M. Westoby, D.S. Falster, R.G. FitzJohn, B.C. O'Meara, **M.W. Pennell**, D.J. McGlinn, J.M. Eastman, A.T. Moles, P.B. Reich, D.C. Tank, I.J. Wright, L.Aarssen, J.M. Beaulieu, R.M. Kooyman, M.R. Leishman, E.T. Miller, U. Niinemets, J. Oleksyn, A. Ordonez, D.L. Royer, S.A. Smith, P.F. Stevens, L. Warman, P. Wilf, and A.E. Zanne. 2014. Functional distinctiveness of major plant lineages. *Journal of Ecology* 102:345-356.

Pennell, M.W., L.J. Harmon, and J.C. Uyeda. 2014. Speciation is unlikely to drive divergence rates. *Trends in Ecology & Evolution* 29:72-73.

Pennell, M.W., L.J. Harmon, and J.C. Uyeda. 2014. Is there room for punctuated equilibrium in macroevolution? *Trends in Ecology & Evolution* 29:23-32.

Maliska, M.E., **M.W. Pennell**, and B.J. Swalla. 2013. Developmental mode influences diversification in ascidians. *Biology Letters* 9:20130068.

Pennell, M.W. and L.J. Harmon. 2013. An integrative view of phylogenetic comparative methods: connections to population genetics, community ecology, and paleobiology. *Annals of the New York Academy of Sciences* 1289:90-105. (Recommended by Faculty of 1000)

Stoltzfus, A., H. Lapp, N. Matasci, H. Deus, B. Sidlauskas, C.M. Zmasek, G. Vaidya, E. Pontelli, K. Cranston, R. Vos, C.O. Webb, L.J. Harmon, M. Pirrung, B. O'Meara, **M.W. Pennell**, S. Mirarab, M.S. Rosenberg, J.P. Balhoff, H.M. Bik, T.A. Heath, P.E. Midford, J.W. Brown, E.J. McTavish, J. Sukumaran, M. Westneat, M.E. Alfaro, A. Steele, and G. Jordan. 2013. Phylotastic! Making tree-of-life knowledge accessible, reusable and convenient. *BMC Bioinformatics* 14:158.

Pennell, M.W. 2012. Biology in the light of phylogeny. *Trends in Ecology & Evolution* 27:657-658.

Pennell, M.W., C.R. Stansbury, L.P. Waits, and C.R. Miller. 2012. Capwire: a R package for estimating population census size from non-invasive genetic sampling. *Molecular Ecology Resources* 13:154-157.

Pennell, M.W., B.A.J. Sarver, and L.J. Harmon. 2012. Trees of unusual size: biased inference of early bursts from large molecular phylogenies. *PLOS ONE* 7:e43348.

Rosenblum, E.B., B.A.J. Sarver, J.W. Brown, S. Des Roches, K.M. Hardwick, T.D. Hether, J.M. Eastman, **M.W. Pennell**, and L.J. Harmon. 2012. Goldilocks meets Santa Rosalia: an ephemeral speciation model explains patterns of diversification across time scales. *Evolutionary Biology* 39:255-261.

Green, D.J., K.B. Loukes, **M.W. Pennell**, J. Jarvis, and W.E. Easton. 2011. Reservoir water levels do not influence daily mass gain of warblers at a riparian stopover site. *Journal of Field Ornithology* 82:11-24.

Additional Writings

S.P. Otto, J. Losos, and **M.W., Pennell**. 2014. Essay inducting Joseph Felsenstein as a Honorary Lifetime Member of the American Society of Naturalists.

FitzJohn, R.G., **M.W. Pennell**, A.E. Zanne, and W.K. Cornwell. 2014. Reproducible research is still a challenge. ROpenSci blog.

Presentations

The evolution of metabolic scaling

University of Calgary, Calgary, AB | Mar 2017 (invited talk)

Simon Fraser University, Burnaby, BC | Mar 2017 (Invited talk)

Evolution, Austin, TX | June 2016 (Young Investigator Prize lecture)

The adequacy of phylogenetic models

CEES, Oslo, NO | Sept 2014 (invited talk)

Evolution, Raleigh, NC | June 2014 (Invited symposium)

Evo-WIBO, Port Townsend, WA | April 2014 (poster)

PEES, Pullman, WA | April 2014 (invited talk)

Evolution, Snowbird, UT | June 2013 (talk)

Nested radiations and the pulse of angiosperm diversification

Evo-WIBO, Port Townsend, WA | April 2012 (poster) ****Best poster****

University of Virginia, Charlottesville, VA | Sept 2012 (invited talk)

University of Texas, Austin, TX | Jan 2012 (invited talk)

Service

Departmental Committees University of British Columbia | July 2016—present

Ecology faculty search committee | Jan 2017

Biodiversity Research Centre Website committee (chair) | Oct 2016

Biodiversity Postdoctoral Fellow search | Jan 2016

Student Committees University of British Columbia | July 2016—present

Member of 4 PhD student committees

Graduate Student Representative American Society of Naturalists | Sept 2012—Sept 2014

Voting position on Executive Council of the Society

Organized student events and reviewed research grant proposals

Expert Reviewer Multiple scientific journals | Sept 2011—Present

Reviewed manuscripts for *Nature*, *Proceedings of the National Academy of Sciences*, *Proceedings of the Royal Society: B*, *Ecology Letters*, *Systematic Biology*, *Evolution*, *Ecology*, *New Phytologist*, *Journal of Evolutionary Biology*, *Methods in Ecology & Evolution*, *PLoS ONE*, *Functional Ecology*, *The ISME Journal*, *Molecular Ecology Resources*, *Bioinformatics*, and *Axiom Reviews*

Editorial Board Member Systematic Biology | June 2016-present

Ad-Hoc Grant Reviewer National Science Foundation, U.S.A. | Sept 2015—Present

Teaching

Undergraduate Courses University of British Columbia | Sept 2016—present
BIOL 300 Fundamental of Biostatistics (Winter 2016)

Lecturer International | Jan 2011—Present

Led workshops in R programming and statistics in Santa Barbara, CA, Durham, NC, Quito, Ecuador, and Český Krumlov, Czech Republic
Co-Taught graduate-level course in *Applied Bioinformatics* at the University of Idaho

Public Outreach National Evolutionary Synthesis Center | March 2015

Participated in the Darwin Day Roadshow; talked about my research at local high schools

Working Groups

Testing the conservation value of phylogenetic diversity (iDiv/CIEE)

The evolution of microbial metabolic and genomic diversity at multiple scales (CIEE)

Tempo and Mode of Plant Trait Evolution (NESCent)

Tree of Sex Consortium (NESCent)

Phylotastic! (NESCent)

SimBank (NESCent)

Software

Arbutus Evaluate statistical adequacy of evolutionary models [GitHub](#)

Geiger Fit evolutionary models to large phylogenetic trees [GitHub](#)

Capwire Estimate population size from genetic data [GitHub](#)

Chromer Access API of Chromosome Counts Database [GitHub](#)

Phyndr Improve overlap of phylogenetic and comparative data [GitHub](#)

Taxonlookup Taxonomic resources for land plants [GitHub](#)

Selected Awards

2017 NSERC Discovery Grant (\$165,000)

2017 Canada Research Chair (Tier 2) (\$500,000)

2017 Canada Fund for Innovation JELF (\$89,817)

2017 BC Knowledge Development Fund (\$89,817)

2016 Young Investigator Award, American Society of Naturalists (\$1500)

2015 Izaak Killam Memorial Fellowship, University of British Columbia (\$100,000)

2015 Marie Skłodowska Curie Research Fellowship, European Research Council (\$294,600)

2015 Postdoctoral fellowship, NSERC (\$90,000)

2015 Diane Haynes Memorial Award (Outstanding graduate student U. Idaho; \$300)

2013 Postgraduate fellowship, NSERC (\$42,000)

2013 Bioinformatics and Computational Biology Fellowship, University of Idaho (\$21,000)

2012 Bioinformatics and Computational Biology Fellowship, University of Idaho (\$21,000)

2012 Graduate Research Fellowship, National Evolutionary Synthesis Center (\$19,000)

2010 Postgraduate fellowship, NSERC (\$19,000)

2010 Vice Pres. of Research, Undergraduate Research Award, Simon Fraser University (\$6,000)

2009 Undergraduate Student Research Award, Simon Fraser University (\$6,000)

2005 Gordon Shrum Entrance Scholarship, Simon Fraser University (\$24,000)