

CAROLINE M. TUCKER CURRICULUM VITAE

PERSONAL

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EDUCATION

PhD. 2013

Department of Ecology and Evolutionary Biology. University of Toronto, Canada

Supervisor: Dr. Marc Cadotte

B.Sc. 2008.

Honours Biology, Mount Saint Vincent University; Canada

PROFESSIONAL EXPERIENCE

Aquatic Research Biologist OS.

Fixed term contract. Ontario Ministry of Natural Resources and Forestry, Aquatic Research and Monitoring Section (Dec. 2020 – present).

Duties include development of Bayesian model of indicator data to improve estimates of recreational fishing pressure on Ontario lakes.

Fixed term contract, Dr. Donald Jackson (University of Toronto) and Ontario Ministry of Natural Resources and Forestry (Sept 2020 – Dec. 2020).

Duties included data organization, statistical data analysis and development of a framework for modelling changes in fish productivity with habitat change in Ontario lakes.

Associate Consultant, Apex Resource Management Solutions. (Aug 2020 – Dec. 2020).

Environmental consulting, protected area planning, and ecological forecasting using quantitative, GIS, and statistical skills.

Adjunct Professor to Curriculum for the Environment, Ecology, and Energy (E3P)

University of North Carolina at Chapel Hill (Aug 2020 - Current).

Assistant Professor. Department of Biology,

University of North Carolina at Chapel Hill (July 2017 – August 2020).

Ran research lab working on experimental microcosms and quantitative community ecology; mentored students and postdoctoral fellows; taught undergraduate and graduate classes in Ecology and Ecological Modelling.

Postdoctoral Research Fellow. EU Marie Skłodowska-Curie International Incoming Fellow.

Centre d'Ecologie Fonctionnelle et Evolutive-CNRS, France. (2016-2017).

NSERC Postdoctoral Research Fellow, University of Colorado, Boulder (2014-2016)

SKILLS

- Author of >30 peer reviewed papers, with >1400 citations. Copies can be found at <http://carolinemtucker.com/publications/>
- Invited speaker, multiple universities and conferences. (2016-2020)
- Excellent statistical skills and experience using open source coding platforms.
 - Experienced R, GIS, Stan, and git user
 - Coauthor of 3 R packages (pez, funrar, and ecolottery).
- Experience interacting with stakeholders and government researchers

- Excellent critical thinking skills and creative thinking.
- Successful mentor and collaborator with diverse individuals at multiple career stages (undergraduate and graduate students, and postdoctoral fellows).

AWARDS & SCHOLARSHIPS

- EU Marie Skłodowska-Curie International Incoming Fellowship (2016)
- British Ecological Society Research Grant (2014)
- NSERC Postdoctoral Fellowship (2014-2016)
- University of Toronto, EEB: Ramsay Wright Award (2012)
- NSERC: Michael Smith Foreign Study Supplement (2012)
- NSERC: Alexander Graham Bell Canada Graduate Scholarship (2009-2012)
- NSERC: Julie Payette Scholarship (2008)

BIBLIOGRAPHY

Frances, D. Barber, A. and *Caroline M. Tucker*. 2020. Trait-density relationships explain performance in cladoceran zooplankton. *Ecology*. *In press*.

Nicolas Loiseau, Nicolas Mouquet, Nicolas Casajus, Matthias Grenié, Maya Guéguen, Brian Maitner, David Mouillot, Annette Ostling, Julien Renaud, *Caroline Tucker*, Laure Velez, Wilfried Thuiller, Cyrille Violle. 2020. Global distribution and conservation status of ecologically rare mammal and bird species. *Nature Communications*. 11: 5071.

Caroline M Tucker, Tracy Aze, Marc W Cadotte, Juan L Cantalapiedra, Chelsea Chisholm, Sandra Díaz, Richard Grenyer, Danwei Huang, Florent Mazel, William D Pearse, Matthew W Pennell, Marten Winter, Arne O Mooers. 2019. Assessing the utility of conserving evolutionary history. *Biological Reviews*. 94(5): 1740-1760.

K. Bodie Weedop, Arne O. Mooers, *Caroline M. Tucker*, William D. Pearse. The Effect of Phylogenetic Uncertainty and Imputation on EDGE Scores. 2019. *Animal Conservation*. Early View. **Featured article**.

Matthias Grenié, David Mouillot, Sébastien Villéger, Pierre Denelle, Valeriano Parravicini, *Caroline M. Tucker*, François Munoz, Cyrille Violle. 2018. Worldwide functional rarity of coral reef fishes: a new currency for conservation strategies. *Biological Conservation*. 226, 288-299.

Florent Mazel, Matthew W. Pennell, Marc Cadotte, Sandra Diaz, Giulio Valentino Dalla Riva, Richard Grenyer, Fabien Leprieur, Arne O. Mooers, David Mouillot, *Caroline M. Tucker*, and William Pearse. 2019. Reply to: “Global conservation of phylogenetic diversity captures more than just functional diversity”. *Nature Communications*: 10(1): 858.

Florent Mazel, Matthew W. Pennell, Marc Cadotte, Sandra Diaz, Giulio Valentino Dalla Riva, Richard Grenyer, Fabien Leprieur, Arne O. Mooers, David Mouillot, *Caroline M. Tucker*, and William Pearse. 2018. Prioritizing phylogenetic diversity captures functional diversity unreliably. *Nature Communications*: 9(1): 2888.

Cadotte, M.W. and *Tucker, C.M.* 2018. Difficult decisions: addressing non-congruence in taxonomic, phylogenetic and functional measures for site priority. *Biological Conservation*. 225:128-133.

Caroline M. Tucker, T. Jonathan Davies, Marc W. Cadotte, and William D. Pearse. 2018. On the relationship between phylogenetic diversity and trait diversity. *Ecology*. 99(6), 1473-1479.

François Munoz, Adrien Taudière, Fabien Laroche, Matthias Grenié, Pierre Denelle, *Caroline M. Tucker* and Cyrille Violle. 2018. ecolottery: Coalescent-based simulation of ecological communities. *Methods in Ecology and Evolution*. 9(3), 693-703.

Matthias Grenié, Pierre Denelle, *C.M. Tucker*, François Munoz, and Cyrille Violle 2017. funrar: an R package to characterize functional rarity. *Diversity and Distributions*. 226, 288-299.

Cadotte, M.W., *Tucker, C.M.* 2017. Should environmental filtering be abandoned? *Trends in Ecology and Evolution*, 32(6), 429-437.

Freschet, G. T., O. J. Valverde-Barrantes, C. M. Tucker, J. M. Craine, L. M. McCormack, C. Violle, F. Fort, C. B. Blackwood, K. R. Urban-Mead, and C. M. Iversen. 2017. Climate, soil and plant functional types as drivers of global fine-root trait variation. *Journal of Ecology*. 105 (5), 1182-1196.

Tucker, C.M., Marc W. Cadotte, Silvia B. Carvalho, Jonathan Davies, Simon Ferrier, Susanne A. Fritz, Rich Grenyer, Matthew R. Helmus, Lanna S. Jin, Arne O. Mooers, Sandrine Pavoine, Oliver Purschke, David W. Redding, Dan. F. Rosauer, Marten Winter, Florent Mazel. 2017. A guide to phylogenetic metrics for conservation, community ecology and macroecology. *Biological Reviews*. 92 (2), 698-715.

Tucker, C.M., Shoemaker, L., Nemergut, D., Davies, K., Melbourne, B.A. 2015. Differentiating between niche and neutral assembly in metacommunities using null models of beta-diversity. *Oikos*. 125 (6), 778-789.

Pearse, W.D, Cadotte, M.W., Cavender-Bares, J., Ives, A.R., Tucker, C.M., Walker, S.C., Helmus, M.R. 2015. pez: Phylogenetics for the Environmental Sciences. *Bioinformatics*. 31 (17), 2888-2890.

Tucker, C.M. and Fukami, T. 2014. Environmental variability counteracts priority effects to facilitate species coexistence: evidence from nectar microbes. *Proc. R. Soc. B*. 281:1778.

Jeganmohan, S., Tucker, C.M., and Cadotte, MW. 2014. Colonization rates in a metacommunity altered by competition. *PLoS ONE*. 9:2, e88344.

Tucker, C.M., Cadotte, M.W. 2013. Unifying measures of biodiversity: understanding when richness and phylogenetic diversity should be congruent. *Diversity and Distributions*. 19:7, 845-854.

Tucker, C.M., Cadotte, M.W. 2013. Fire variability, not frequency explains species coexistence in a fire-dominated system. *Journal of Applied Ecology*. 50(3), 594-602.

Abrams, P., Tucker, C.M., Gilbert, B. 2012. Evolution of the storage effect. *Evolution*. 67(2), 315-327.

Tucker, C.M., Rebelo, A.G., Davies, J.D., Cadotte, M.W. 2012. The distribution of biodiversity: linking richness to geographical and evolutionary rarity in a biodiversity hotspot. *Conservation Biology*. 25:2, 593-601.

Tucker, C.M., Rebelo, T.R., Manne, L.L. 2011. How disturbance affects the distribution and abundance of species in a fire-adapted system. *Ecography*. 35:4, 348-355.

Tucker, C.M., Avila-Sakar, G. 2010 Ontogenetic changes in tolerance to herbivory among three ecotypes of *Arabidopsis thaliana*. *Oecologia*. 164:4, p1005-1015.

R libraries

Grenié, M., Denelle, P., Tucker, C.M. Funrar: functional rarity indices computation. 2016. (<https://cran.r-project.org/web/packages/funrar/index.html>)

François Munoz, Adrien Taudière, Fabien Laroche, Matthias Grenié, Pierre Denelle, Caroline M. Tucker and Cyrille Violle. ecolottery: Coalescent-Based Simulation of Ecological Communities. (<https://cran.r-project.org/web/packages/ecolottery/index.html>)

Pearse, W.D, Cadotte, M.W., Cavender-Bares, J., Ives, A.R., Tucker, C.M., Walker, S.C., Helmus, M.R. 2015. pez: Phylogenetics for the Environmental Sciences. (<https://cran.r-project.org/web/packages/pez/index.html>)

WORKSHOPS

sCAP: Conservation and Phylogenies working group, *co-organized* with Arne Mooers (2017-2018)

- German Centre for Integrative Biodiversity Research (iDiv)
- Canadian Institute for Ecology and Evolution (CIEE)

Cutting EDGE: science for conservation, *Participant*, Zoological Society of London (2017)

sPHY: Synthesizing phylogenetic measures for ecology and conservation, *Participant*, iDiv (2013-2015)

TEACHING ACTIVITIES

UNC-Biol/Enec 695: Grant writing seminar (Spring 2020)

UNC-Biology 395: Undergraduate Research for Credit (Fall 2017-2020)

UNC-Biol/Enec 669*005: Ecological Modelling in R. (Winter 2019)

UNC-Biol/Enec 461/461L: Principles in Ecology (Fall 2019)
UNC-Biology 891: Special Topics in Ecology and Evolution. (Winter 2018)
Graduate committee member: 8 graduate students
Undergraduate mentorship: >20 students (2012-2020)

PROFESSIONAL SERVICE

Handling editor: Ecology Letters (2019-2020).

Referee: The American Naturalist, Biological Conservation, Canadian Journal of Fisheries and Aquatic Science, Diversity and Distributions, Ecology, Ecology Letters, Ecography, Environmental Microbiology, Global Ecology and Biogeography, Journal of Applied Ecology, Journal of Animal Ecology, Journal of Chemical Ecology, Journal of Molecular Ecology, Journal of Plant Ecology, Methods in Ecology and Evolution, Nature, Nature Ecology and Evolution, Oecologia, Oikos, PLoS ONE, Philosophical Transactions of the Royal Society, Proceedings of the Royal Society, B.

Invited symposiums, lectures and meetings

- Tucker, C.M. 2019. Confronting complexity in trait-based analyses. Ohio State University.
- Tucker, C.M. 2019. Confronting complexity in trait-based analyses. University of Arizona.
- Tucker, C.M. 2019. Confronting complexity in trait-based analyses. Annual meeting of Japanese Society for Population Biology.
- Tucker, C.M. 2019. Not so simple: Confronting complexity in trait-based analyses University of Wisconsin, Madison. Dept. of Botany.
- Tucker, C.M. 2019. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." University of Wisconsin, Madison. iBio.
- Tucker, C.M. 2019. Not so simple: confronting complexity in trait-based analyses. University of Maryland, BEES graduate program.
- Tucker, C.M. 2018. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." Utah State University. (Invited talk).
- Tucker, C.M. 2018. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." NCSU. (Invited talk).
- Tucker, C.M. 2017. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." Duke University. (Invited talk).
- Tucker, C.M. 2017. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." Curriculum in Ecology and the Environment, University of North Carolina. (Invited talk).
- Tucker, C.M. 2016. "Biodiversity in a variable world". University of Mississippi, Biology Department (Invited talk).
- Tucker, C.M. 2016. "Biodiversity in a variable world". University of North Carolina, Chapel Hill (Invited talk).