

EDUCATION

Virginia Commonwealth University	Richmond, Virginia
Ph.D. Integrative Life Sciences	May 2018
Advisor: Dr. Andrew Eckert	
Dissertation title: <i>Understanding Natural and Anthropogenic Drivers of Tree Evolutionary Dynamics</i>	
Iowa State University	Ames, Iowa
Graduate coursework in ecology, genetics, and plant physiology	August 2010-May 2011
University of Northern Iowa	Cedar Falls, Iowa
Bachelor's in Chemistry	May 2010
Bachelor's in Biology	May 2010

PROFESSIONAL EXPERIENCE

Research Fellow – Artificial Intelligence, Adaptation to Complex Environments	January 2022 - Present
Department of Marine and Environmental Sciences	
Northeastern University, Massachusetts, USA	
Research Supervisor: Dr. Katie Lotterhos	
Research Fellow – Ecological Genomics of Climate Adaptation in Conifers	June 2018 – December 2021
Centre for Forest Conservation Genetics, Department of Forest and Conservation Sciences	
University of British Columbia, British Columbia, Canada	
Research Supervisors: Drs. Sally Aitken, Sam Yeaman	

MANUSCRIPTS IN PREPARATION AVAILABLE UPON REQUEST

link to public code on p. 5; * shared first authorship; † undergraduate author

21. R Candido-Ribeiro, **BM Lind**, M Lu, D Vidakovic, P Singh, S Yeaman, SN Aitken. Evolutionary potential to overcome climate extremes: genetic architecture and distribution of genomic variation associated with frost and drought tolerance in Douglas-fir.
20. **BM Lind**, P Singh, M Lu, D Vidakovic, S Yeaman, S Aitken, N Isabel. Ecological genomics and adaptive structure in jack pine, a widespread conifer.
19. T Booker*, P Singh*, **BM Lind**, M Lu, T McDonald, D Vidakovic, S Aitken, M Whitlock, S Yeaman. The molecular basis of convergent adaptation to climate among seven distantly related conifer species.
18. **BM Lind***, L Rettenbacher*†, R Candido-Ribeiro, S Aitken. Patterns and climate drivers of adaptive genetic variation in natural and landrace populations of Douglas-fir.
17. R Candido-Ribeiro*, **BM Lind***, M Lu, D Vidakovic, S Yeaman, SN Aitken. Genomic response of selective breeding in two varieties of Douglas-fir.
16. **BM Lind**, M Lu, P Singh, D Vidakovic, SN Aitken, S Yeaman. Development and validation of a split 50k Axiom array for lodgepole pine and Douglas-fir.

PUBLICATIONS

15. (2024)# **BM Lind**, KE Lotterhos. The limits of prediction maladaptation to future climates with genomic data. *In review at Molecular Ecology Resources*. Available on bioRxiv. <https://doi.org/10.1101/2024.01.30.577973>
14. (2023) J Whiting, TR Booker, **BM Lind**, Genomics Consortium, S Yeaman. Core genes drive climate adaptation in plants. *In review at Nature Ecology & Evolution*.
13. (2023)# M Lu, N Feau, **BM Lind**, P Singh, D Vidakovic, R Hamelin, SN Aitken, S Yeaman. Genetic architecture underlying response to the fungal pathogen *Dothistroma septosporum* in *Pinus contorta*, *Pinus banksiana*, and their hybrids. *In revision at Heredity*.
12. (2023)# **BM Lind**, R Candido-Ribeiro, P Singh, M Lu, D Vidakovic, T Booker, M Whitlock, N Isabel, S Yeaman, SN Aitken. How useful is genomic data for predicting maladaptation to future climate? *In Press at Global Change Biology*, available on bioRxiv. <https://biorxiv.org/cgi/content/short/2023.02.10.528022v1>

11. (2022)# P Singh, B St Clair, **BM Lind**, R Cronn, NP Wilhelmi, M Lu, D Vidakovic, R Hamelin, D Shaw, SN Aitken, S Yeaman Genomic architecture of resistance and tolerance to Swiss needle cast and *Rhabdocline* needle cast diseases in Douglas-fir. *In revision at New Phytologist*, available at <https://doi.org/10.32942/osf.io/s5rd7>
10. (2021) R Jasper, TK McDonald, P Singh, M Lu, C Rougeux, **BM Lind**, S Yeaman. Evaluating the accuracy of variant calling methods using the frequency of parent-offspring genotype mismatch. *Molecular Ecology Resources* (22) 2254-2533. DOI: <https://doi.org/10.1111/1755-0998.13628>
09. (2021)# **BM Lind***, M Lu*, D Vidakovic, P Singh, T Booker, SN Aitken, S Yeaman. Haploid, diploid, and pooled exome capture recapitulate features of biology and paralogy in two non-model tree species. *Molecular Ecology Resources* (00) 1-14. DOI: <https://doi.org/10.1111/1755-0998.13474>
08. (2021) IR MacLachlan, TK McDonald, **BM Lind**, LH Rieseberg, S Yeaman, SN Aitken. Genome-wide shifts in climate-related variation underpin responses to selective breeding in a widespread conifer. *Proceedings of the National Academy of Science* 18(10) e2016900118. <https://doi.org/10.1073/pnas.2016900118>
07. (2019) CR Mahoney, IR MacLachlan, **BM Lind**, JB Yoder, T Wang, SN Aitken. Evaluating genomic data for management of local adaptation in a changing climate: A lodgepole pine case study. *Evolutionary Applications* 00:1-16. DOI: <https://doi.org/10.1111/eva.12871>
06. (2019) CJ Friedline, TM Faske, **BM Lind**, EM Hobson†, P Dylant, R Dyer, D Johnson, L Thompson, K Grayson, AJ Eckert. Evolutionary genomics of gypsy moth populations sampled along a latitudinal gradient. *Molecular Ecology* 28:2206-2223. DOI: <https://doi.org/10.1111/mec.15069>
05. (2019)# **BM Lind**, MP North, PE Maloney, AJ Eckert. Effect of fire and thinning on fine-scale genetic structure and gene flow in fire-suppressed populations of sugar pine (*Pinus lambertiana* Douglas). *Forest Ecology and Management* 447:115-129. DOI: <https://doi.org/10.1101/448522>
04. **INVITED** (2018)# **BM Lind**, M Mennon, CE Bolte, TM Faske, AJ Eckert. The genomics of local adaptation in trees: Are we out of the woods yet? *Tree Genetics & Genomes* 14: 29. DOI: <https://doi.org/10.1007/s11295-017-1224-y>
03. (2017)# **BM Lind**, CJ Friedline, JL Wegrzyn, PE Maloney, DR Vogler, DB Neale, AJ Eckert. Water availability drives signatures of local adaptation in whitebark pine (*Pinus albicaulis*) across fine spatial scales of the Lake Tahoe Basin, USA. *Molecular Ecology* 26: 3168-3185. DOI: <http://dx.doi.org/10.1111/mec.14106>
02. (2016) AJ Eckert, DE Harwood, **BM Lind**, EM Hobson†, A Mix, PE Maloney, CJ Friedline. The genetic architecture of local adaptation II: The QTL landscape of water-use efficiency for foxtail pine (*Pinus balfouriana* Grev. & Balf.). <https://doi.org/10.1101/038240>
01. (2015) CJ Friedline, **BM Lind**, EM Hobson†, DE Harwood, A Mix, PE Maloney, AJ. The genetic architecture of local adaptation I: The genomic landscape of foxtail pine (*Pinus balfouriana* Grev. & Balf.) as revealed from a high-density linkage map. *Tree Genetics & Genomes* 11:1-15. DOI: <http://dx.doi.org/10.1007/s11295-015-0866-x>

PRESENTATIONS

Keynote Speaker

15. (Sept 2023) **Lind BM** The limits of predicting maladaptation to future climates with genomic data. EVOLTREE conference. Transilvania University of Braşov. Braşov, Romania.

Invited

14. (Jan 2024) **Lind BM** How useful is genetic data for species management? Lessons from Forest Trees. Department seminar, Nicholas School of the Environment, Duke University.
13. (Dec 2022) **Lind BM** Leveraging ecological genomics to inform species management. Department seminar, Department of Marine & Environmental Sciences, Northeastern University.
12. (Sept 2021) **Lind BM**, R Candido-Ribeiro, P Singh, M Lu, D Vidakovic, T Booker, M Whitlock, N Isabel, S Yeaman, SN Aitken. How off are genetic offset predictions? Lessons from common gardens and three clades of conifers. EVOLTREE conference. Virtual.
11. (Jan 2020) **Lind BM**; P Singh, S Yeaman, SN Aitken. Convergence of Polygenic Climate Adaptation in Conifers. Tree Genetics Workshop, Plant & Animal Genome conference. San Diego, California.
10. (Jan 2019) **Lind BM**; M Lu, D Vidakovic, S Yeaman, SN Aitken. An efficient method to genotype species with large and complex genomes. Tree Genetics Workshop, Plant & Animal Genome conference. San Diego, California.
09. (Oct 2016) **Lind BM**; CJ Friedline, JL Wegrzyn, PE Maloney, DR Vogler, CE Jensen, AD Mix, DB Neale, and AJ Eckert. Local adaptation of three white pine species across fine spatial scales of the Lake Tahoe Basin, USA:

Implications to sustainable management and conservation of conifer species. Natural Areas conference. Davis, California.

Contributed

08. (May 2021) **Lind BM**, S Yeaman, SN Aitken. Patterns and climate drivers of adaptive variation in Douglas-fir. Western Forest Genetics Association conference. Virtual.
07. (June 2019) **Lind BM**, M Lu, D Obreht Vidakovic, S Yeaman, SN Aitken. Combining exome capture and pool-seq: Lessons from three conifer species. Evolution conference. Providence, RI.
06. (June 2017) **Lind BM**, M North, AJ Eckert. Time to tree-think the genetics effects of forest management: Assessing patterns and processes beyond heterozygosity indices. Evolution conference. Portland, OR
05. (Feb 2017) **Lind BM**; M Menon, C Bolte, T Faske, AJ Eckert. The genomics of local adaptation in trees: Are we out of the woods yet?. ILS Showcase. Richmond, Virginia.
04. (June 2016) **Lind BM**; CJ Friedline, JL Wegrzyn, PE Maloney, DR Vogler, DB Neale, and AJ Eckert. When local means local: polygenic signatures of local adaptation within whitebark pine (*Pinus albicaulis* Engelm.) across the Lake Tahoe Basin, USA. Evolution conference. Austin, Tx.
03. (June 2015) **Lind BM**; PE Maloney, DR Vogler, DB Neale, and AJ Eckert. Genetic architecture of fitness-related traits in whitebark pine (*Pinus albicaulis* Englm.). 35th New Phytologist Symposium - The Genomes of Forest Trees: New Frontiers in Forest Biology. Harvard University. Boston, MA. Poster.
02. (Nov 2014) Friedline CJ; **BM Lind**, EM Hobson, DE Harwood, AD Mix, PE Maloney, and AJ Eckert. Local adaptation and linkage maps - a first step towards the genomic architecture of fitness-related phenotypes in natural populations. VCU Integrative Life Science Ph.D. Showcase. Richmond, VA. Poster.
01. (June 2014) **Lind BM**; EM Hobson, MP North, AJ Eckert. Proposal: Genetic effects of factorial fire and thinning in fire-suppressed populations of Jeffrey and sugar pine. Evolution conference. Raleigh, NC. Poster.

TEACHING

Workshops

2023	Logistics for Project Informatics: From File Systems to Project API	Nahant, MA
2023	Version control, git, and GitHub	Nahant, MA
2023	Primer in Geographic Information Systems	Nahant, MA
2022	Bioinformagics: Tips, tricks, and best practices for productive and reproducible research	Nahant, MA

Guest Lecturer

2022	Reproducibility and Publication Bias (in: Intro to environmental, social, and biological data)	Nahant, MA
2018	Hardy-Weinberg equilibrium (in: Evolution)	Richmond, VA
2017	Hardy-Weinberg equilibrium (in: Evolution)	Richmond, VA
2016	Null hypotheses in evolutionary biology (in: Evolution)	Richmond, VA
2015	Population differentiation/genetics, F_{ST} (in: Evolution)	Richmond, VA

Teaching Assistant

2014-2017	Introduction to Biology Laboratory	Richmond, VA
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- When I began teaching the laboratory sections for this course, there were no teaching materials to convey information to students, and there was no link between hypothesis testing and their midterm or final experiments for the course
- When I ended my assistantship, I left with the course organizers Power Point slides for each lab's lecture portion, quizzes for each lab exercise, and developed a drag-and-drop statistical analysis in R so that students could incorporate hypothesis testing (support for null or alternative hypothesis) into their experimental results and discussions
- The drag-and-drop analysis was customizable with custom error messages so that it would prompt students for sample sizes and measurement type to check their data for errors and to ensure the correct statistical test was run consistently across lab sections, without the need for entry-level students to understand how to use R and instead just how to drag and drop the script file into R and hit enter, which would automatically find and run analysis on their data file

CONTRIBUTIONS TO DIVERSITY, EQUITY, INCLUSION, BELONGING, AND MENTORSHIP

Mentorship (ongoing)

Student mentees

- (2018-Present) Rafa Candido-Ribeiro, Beth Roskilly, Madeline Eppley, Sarit Truskey, Camille Rumberger, Kiran Bajaj, Elisabeth Leung, Nicole Mongillo, Clara Winguth
- (2012-2018) Britta Austin; Shelby Bennett; Ayana Ferrer; Casey Harless; Erin Hobson; Angela Simpson; Rachel Stevenson; Alexandra Stylianou; Tammy Tran; Hugo Vargas Cruz

VCU Graduate Student Mentorship Program (2013 – 2016)

- Paired with and mentored three undergraduate students planning on applying to graduate school within a formal mentoring program at Virginia Commonwealth University. Paired for one academic year. All three of my mentees have been accepted to graduate school ranging from medical school to academic research in a Ph.D. program.

Assisted in crafting Land Acknowledgment for Nahant campus of Northeastern University (2023)

UBC Forestry Diversity Crew member (2020 – 2021)

VCU Rice Rivers Center outreach weekend (2012)

- Assisted in and helped organize educational weekend at VCU nature center for the Virginia School for the Deaf and Blind

PHILANTHROPY AND OUTREACH

Skype a Scientist (2017 – 2022)

- I have been matched with various elementary, middle, and high school classrooms across the United States to help communicate science. These meetings are structured so that students can ask questions about my research as well as about science careers in general. It is very rewarding to engage students in their formative years.

St. Jude Children's Research Hospital's "Up 'til Dawn", University of Northern Iowa (2006-2008)

Founder / Director UNI Chapter – Cedar Falls, IA

- Contacted St. Jude regional office and began collaboration for new Up 'til Dawn chapter
- Arranged campus wide informational meetings to recruit, review, and select members of the executive board
- Organized, planned and ran weekly meetings for the executive board as well as organization's budget
- Raised >\$23,000 the inaugural year, and >\$100,000 over the chapter's lifetime

Other Philanthropy (2004-2008)

(Co)Founder – Cedar Falls, IA

- Relay for Life Benefit Concert – 'Rock-4-a-Cure' on Main Street, \$1,600 annual average
- American Diabetes Association Dodge Ball Tournament, \$500 annual average
- Valentine's Day registration tables for the Iowa Donor Network – 'Truly Give Away Your Heart'
- Organized and volunteered at annual volunteer efforts for Big Brothers Big Sisters, Highway Cleanup, Habitat for Humanity, Special Olympics as well as the flood relief efforts in Black Hawk County, Iowa

SERVICE

Data Editor – *The American Naturalist* (2021 – 2023)

- Responsible for assessing code and data archives for manuscripts accepted to *The American Naturalist*

Journal Peer Review

- Molecular Ecology; Heredity; New Phytologist; Plant Ecology & Diversity; Conservation Genetics; Global Change Biology; G3 Genes | Genetics | Genomes; Forest Ecology & Management; Ecology & Evolution; BMC Ecology & Evolution

Society member

- American Genetic Association, Society for the Study of Evolution, Natural Areas Association, Society of Molecular Biology & Evolution

Poster Judge – BIOL 318 University of British Columbia (April 2018)

Virginia Junior Academy of Science judge (2013 – 2014)

Journal club - Assistant to the regional manager (2012 – 2018):

- Helped organize and facilitate Evolution Fridays (EvolFri) weekly reading group at Virginia Commonwealth University

AWARDS & FUNDING

- Nominated – IUFRO Excellence in Forest Molecular Biology and Genomics 2022
- UBC Postdoctoral Fellowship - \$175,000 2018-2021
- VCU Graduate School Dissertation Fellowship - academic year \$25,000 2017-2018
- VCU College of Humanities and Sciences Outstanding Ph.D. student 2016-2017
- Integrative Life Science Travel Award \$1,000 USD 2016
- New Phytologist Trust Student Travel Award \$500 USD 2015
- Integrative Life Science Travel Award \$1,000 USD 2015
- VCU Graduate School Research Fellowship - 12 month 2013-2014
- VCU Graduate School Research Fellowship - 12 month 2012-2013

PUBLIC CODING AND GENETIC RESOURCES

Analysis code from previous and current research:

- Lind BM. 2023a. GitHub.com/brandonlind/jack_pine_natural_populations: Offset Revision 1 (v1.0.0). Zenodo. <https://doi.org/10.5281/zenodo.8018892> (see Publication 12)
- Lind BM. 2023b. GitHub.com/brandonlind/douglas_fir_natural_populations: Offset Revision 1 (v1.0.0). Zenodo. <https://doi.org/10.5281/zenodo.8018894> (see Publication 12)
- Lind BM. (2024a) GitHub.com/brandonlind/offset_validation: Publication release (Version 1.1.0). Zenodo. <https://doi.org/10.5281/zenodo.7641225> (see Publication 12)
- Lind BM. (2024b) GitHub.com/ModelValidationProgram/MVP-offsets: Preprint release (Version 1.0.0). Zenodo. (see Publication 15)
- Lind BM. (2021a) GitHub.com/CoAdapTree/gatk_pipeline: Publication release (Version 1.0.0). Zenodo. <http://doi.org/10.5281/zenodo.5083321> (see Publication 09)
- Lind BM. (2021b) GitHub.com/CoAdaptree/ varscan_pipeline: Publication release (Version 1.0.0). Zenodo. <http://doi.org/10.5281/zenodo.5083302> (see Publication 09)
- Lind BM. (2021c) GitHub.com/CoAdaptree/testdata_validation: Publication release (Version 1.0.0). Zenodo. <http://doi.org/10.5281/zenodo.5083292> (see Publication 09)
- Lind BM. (2021d) GitHub.com/CoAdaptree/cmh_test: Preprint release (Version 1.0.0). Zenodo. <http://doi.org/10.5281/zenodo.5083798> (see Publications 11, 13)
- <https://github.com/brandonlind/teakettle> (see Publication 05)
- https://github.com/brandonlind/out_of_the_woods (see Publication 04)
- https://github.com/brandonlind/whitebark_pine (see Publication 03)

Foxtail pine genetic linkage map:

- Tree Genes Comparative Map Database, Accession Number: TG151

TECHNICAL EXPERIENCE

Teakettle Experimental Forest

Sierra National Forest, CA

Field Technician

June 2011 – August 2011

- Working unsupervised, measured ecological attributes for a project examining trade-offs of management practices' impact on forest dynamics via the inclusion and exclusion of Rx fire as well as thinning treatments
- Collected and individual-level data (DBH, species, decay/disease class)
- Used knowledge of flora for identification and records of forest plants, using dichotomous key-outs as needed
- Surveyed forest spatial inventory using offset GPS (laser station/Trimble)

Spatially Maximized Arrays of DNA Nanofibers, Iowa State University

Ames, IA

National Science Foundation Research Experiences for Undergraduates (NSF REU)

June 2010–August 2010

- Independently addressed objective to geometrically align DNA nanofibers for future use as a scaffolding for the spontaneous alignment of organized arrays of metallic nanowires for bottoms-up fabrication of electronics
- Through personally devised original methods based upon confined evaporative self-assembly (CESA), spatial area over which arrays of parallel DNA nanofibers was increased by a full order of magnitude over that of previous research in the literature, resulting in millimeter-scale nanofibers
- Formulated methods reduced cost, effort and timescale of fabrication
- Senior PI acknowledges I earned authorship for a subsequent publication in *ACS Nano*

OTHER WORK EXPERIENCE

Crop Genome Informatics Laboratory (CGIL), Iowa State

Ames, IA

Research Reference Librarian

October 2010–December 2010

SUPERVISOR/REFERENCE CONTACT INFORMATION

All references can be contacted.

Katie Lotterhos, Ph.D. – Current Postdoc Advisor
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Northeastern University
430 Nahant Road
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