

EDUCATION

Virginia Commonwealth University
Ph.D. Integrative Life Sciences
Advisor: Dr. Andrew Eckert

Richmond, Virginia
May 2018

Dissertation title: Understanding Natural and Anthropogenic Drivers of Tree Evolutionary Dynamics

Iowa State University

Graduate and undergraduate coursework in ecology, genetics, and plant physiology

Ames, Iowa
August 2010-May 2011

University of Northern Iowa
Bachelor's in Chemistry
Bachelor's in Biology

Cedar Falls, Iowa
May 2010
May 2010

PROFESSIONAL EXPERIENCE

Postdoctoral Research Fellow

June 2018 - present

Centre for Forest Conservation Genetics, Department of Forest and Conservation Sciences

University of British Columbia

Research Supervisors: Sally Aitken, Richard Hamelin, Sam Yeaman

PUBLICATIONS

10. (accepted) **Lind BM***, M Lu*, D Vidakovic, P Singh, T Booker, S Yeaman, S Aitken. Haploid, diploid, and pooled exome capture recapitulate features of biology and paralogy in two non-model tree species. *Molecular Ecology Resources*. Available on bioRxiv: <https://doi.org/10.1101/2020.10.07.329961>
9. (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>
8. (2019) Mahoney CR, 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>
7. (2019) Friedline CJ, TM Faske, **BM Lind**, EM Hobson, P Dylan, 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>
6. (2019) **Lind BM**, 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>
5. **INVITED** (2018) **Lind BM**, 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>
4. (2017) **Lind BM**, 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>
3. (2016) Eckert AJ, 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>
2. (2015) Friedline CJ, **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>
1. (2013) Li B, W Han, M Byun, L Zhu, Q Zhou, ZQ Lin. Macroscopic highly aligned DNA nanowires created by controlled evaporative self-assembly. *ACS Nano* 7: 4326-4333. <http://dx.doi.org/10.1021/nn400840y>

PRESENTATIONS

Invited

- (Jan 2020) **Lind BM**; P Singh, S Yeaman, S Aitken. Convergence of Polygenic Climate Adaptation in Conifers. Tree Genetics Workshop, Plant & Animal Genomes conference. San Diego, California.

- (Jan 2019) **Lind BM**; M Lu, D Vidakovic, S Yeaman, S Aitken. Combining exome capture and pool-seq: An efficient method to genotype species with large and complex genomes. Tree Genetics Workshop, Plant & Animal Genomes conference. San Diego, California.
- (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

- (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
- (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.
- (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.
- (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.
- (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.
- (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.

AWARDS & FUNDING

- | | |
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| • VCU Graduate School Dissertation Fellowship - academic year | 2017-2018 |
| • VCU College of Humanities and Sciences Outstanding Ph.D. student award | 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:

- https://github.com/CoAdapTree/varscan_pipeline
- https://github.com/CoAdapTree/gatk_pipeline
- <https://github.com/CoAdapTree/pyppoolation>
- https://github.com/CoAdapTree/doug_fir_mapping_pops_analyses
- https://github.com/CoAdapTree/cmh_test
- <https://github.com/brandonlind/teakettle>
- https://github.com/brandonlind/out_of_the_woods
- https://github.com/brandonlind/whitebark_pine

Foxtail pine genetic linkage map:

- Tree Genes Comparative Map Database, Accession Number: TG151

ACADEMIC INSTRUCTION

Introduction to biology laboratory (BIOL 151)

Teaching Assistant

Richmond, VA

Aug 2014 – May 2017

- 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

Substitute lecturer: Evolution (BIOL 318)

Richmond, VA

- For three years, I filled in as a substitute lecturer for Andrew Eckert's evolution course at VCU about once each fall semester. I have taught sections relating to population genetics, ranging from Hardy-Weinberg equilibrium to neutral demographic processes and allele frequency differentiation among populations

SERVICE

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

Society member

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

UBC Forestry Diversity Crew member (2020 – present)

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

- Interviewed student pairs for final project of Animal Behavior course, assessed poster and responses

Skype a Scientist (2017 – present)

- 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.

Mentorship

Graduate student mentoring (2018 – present)

- I am active in teaching bioinformatic skills to the students in the Aitken lab at UBC

Undergraduate student mentees while at VCU – wet lab and field (2012-2018)

- Austin, Britta; Bennett, Shelby; Ferrer, Ayana; Harless, Casey; Hobson, Erin; Simpson, Angela; Stevenson, Rachel; Stylianou, Alexandra; Tran, Tammy; Vargas Cruz, Hugo

VCU Graduate Student Mentorship Program (2013 – 2016)

- Paired with and formally mentored undergraduate students planning on applying to graduate school. 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.

Virginia Junior Academy of Science judge (2013 – 2014)

- Served as referee for research awards to undergraduate proposals across Virginia institutions

VCU Rice Rivers Center outreach weekend (2012)

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

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

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

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

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 University

Ames, IA

Research Reference Librarian

October 2010–December 2010

- Responsible for the organization of a small library of books, texts, symposia and related topics on maize genetics for the CGIL, organized library into electronic file for easy access online