

## **Sam Yeaman, Ph.D.**

Department of Biological Sciences  
University of Calgary  
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### **EDUCATION**

Ph.D. 2004-2009

Department of Zoology. Supervisor: Dr. Michael Whitlock  
University of British Columbia, Vancouver, Canada

B.Sc. 1998-2003

Joint major: Biology / Environmental and Resource Sciences (honours)  
Trent University, Peterborough, Canada

### **ACADEMIC EMPLOYMENT**

Assistant professor, AIHS Chair in bioinformatics and computational biology  
University of Calgary, Canada. August 2015-present.

Post-doctoral fellow, University of British Columbia, Vancouver, Canada  
Supervisors: Sally Aitken & Loren Rieseberg. July 2011-June 2015  
Project: Bioinformatics and sequence analysis of >1200 exomes

Post-doctoral fellow, University of Neuchâtel, Neuchâtel, Switzerland  
Supervisor: Laurent Lehmann. March 2010-May 2011  
Project: Cultural evolution in spatially structured populations

### **GRANTS**

- 2015 AIHS chair in Bioinformatics and Computational Biology (7 years; \$325k/year)
- 2015 Genome Canada LSARP: Genomics of Abiotic Stress Resistance in Wild and Cultivated Sunflowers (\$8.1M; co-applicant portion \$200k)

### **AWARDS AND FELLOWSHIPS**

- 2015 Canadian Society for Ecology and Evolution Early Career Award
- 2012 NSERC Post Doctoral Fellowship (declined)
- 2010 Society for the Study of Evolution travel award
- 2009 University of British Columbia Graduate Fellowship
- 2006 NSERC Post Graduate Scholarship (Doctoral, three years)
- 2005 NSERC Canada Graduate Scholarship (Masters, one year)
- 2004 University of British Columbia, Graduate Entrance Scholarship
- 2002 Trent University, Historical Essay Prize
- 2001 Trent University, R.J.D. Prize

- 2000 Trent University, J. Percy McNaughton Prize
- 2000 Trent University, Biology Department Book Prize
- 1998 Carleton University, Entrance Scholarship (declined)
- 1998 Trent University, Entrance Scholarship

## PUBLICATIONS

- High standard contributions (2012 ISI impact factors: Science 31.0, Nature Communications 10.0, PNAS 9.7, New Phytologist 6.7, Phil Trans Roy Soc B 6.2, Global Change Biology 6.9, Molecular Ecology 6.3, Proc Roy Soc B 5.7, Evolution 4.9, Evolutionary Applications 4.2)
  - One paper selected by the Faculty of 1000 (2011)
  - Authored the most highly cited paper in the journal Evolutionary Applications
  - Productivity and impact of work: h-index = 12 (ISI Thomson Reuter) to 13 (Google Scholar), total citations: 845 (ISI) to 1311 (Google Scholar)
1. **Yeaman S.** 2015. Local adaptation by alleles of small effect. *American Naturalist* (in press).
  2. Debarre F, **Yeaman S**, Guillaume F. 2015. Evolution of Quantitative Traits under a Migration-Selection Balance: When Does Skew Matter? *American Naturalist* (in press).
  3. **Yeaman S**, Hodgins KA, Nurkowski K, Holliday JA, Rieseberg LH, Aitken SN. Conservation and divergence of gene expression plasticity over ~140 million years of evolution in lodgepole pine (*Pinus contorta*) and interior spruce (*Picea glauca* x *Picea engelmannii* and their hybrids). *New Phytologist*. 203:578-591. [ISI Impact Factor = 6.74][ISI Citations = 3]
  4. Condon C, Cooper BS, **Yeaman S**, Angilletta MJ. 2014. Temporal variation favors the evolution of generalists in experimental populations of *Drosophila melanogaster*. *Evolution*. 68:720-728. [IF = 4.86][C = 6]
  5. **Yeaman S.** 2013. Hybridization and the porous genome: patterns of isolation and introgression in manakins. *Molecular Ecology*. 22:3195-3197. [IF = 6.28][C = 0]
  6. Renaut S, Grassa CJ, **Yeaman S**, Moyers BT, Lai Z, Kane NC, Bowers JE, Burke JM, Rieseberg LH. 2013. Genomic islands of divergence are not affected by geography of speciation in sunflowers. *Nature Communications*. 4:1827. [IF = 10.02][C = 44]
  7. **Yeaman S.** 2013. Genomic rearrangements and the evolution of clusters of locally adapted loci. *Proceedings of the National Academy of Sciences*. 110:E1743-E1751. [IF = 9.74][C = 22]
  8. Alberto F, Aitken S, Alia R, González-Martínez S, Hanninen H, Kremer A, Lefèvre F, Lenormand T, **Yeaman S**, Whetten R, Savolainen O. 2013. Potential for evolutionary response to climate change - evidence from tree populations. *Global Change Biology*. 19:1645-1661. [IF = 6.91][C = 56]

9. Vines TH, Andrew RL, Bock DG, Franklin M, Gilbert KJ, Kane NC, Kleynhans EJ, Moore J-S, Moyers BT, Renaut S, Rennison DJ, Veen T, **Yeaman S**. 2013. Mandated data archiving greatly improves access to research data. *FASEB Journal*. 27:1304-1308. [IF = 5.70][C = 13]
10. **Yeaman S**, Schick A, Lehmann L. 2012. Social network architecture and the maintenance of deleterious cultural traits. *Journal of the Royal Society Interface*. 9:848-858 [IF = 4.90][C = 2]
11. Feder JL, Gejji R, **Yeaman S**, Nosil P. 2012. Establishment of new mutations under divergence and genome hitchhiking. *Philosophical Transactions of the Royal Society, B*. 367:461-474. [IF = 6.23][C = 49]
12. **Yeaman S**, Bshary R, Lehmann L. 2011. The effect of innovation and sex-specific migration on neutral cultural differentiation. *Animal Behaviour*. 82:101-112. [IF = 3.07][C = 4]
13. **Yeaman S** and Otto SP. 2011. Local adaptation under migration, selection, and drift. *Evolution*. 65:2123-2129. [IF = 4.86][C = 43] [Listed as a recommended read on Faculty of 1000]
14. **Yeaman S** and Whitlock MC. 2011. The genetic architecture of adaptation under migration-selection balance. *Evolution*. 65:1897-1911. [IF = 4.86][C = 75][4<sup>th</sup> most highly cited paper of the year in the journal]
15. **Yeaman S**, Chen Y, Whitlock MC. 2010. Maintenance of genetic variation in heterogeneous environments: wing size evolution in experimental populations of *Drosophila melanogaster*. *Evolution*. 64:3398-3408. [IF = 4.86][C = 19]
16. Correia L, **Yeaman S**, and Whitlock MC. 2010. Local adaptation does not always predict high mating success. *Journal of Evolutionary Biology*. 23:875-878. [IF = 3.48][C = 5]
17. **Yeaman S** and Guillaume F. 2009. Predicting adaptation under migration load: the role of genetic skew. *Evolution*. 63:2926-2938. [IF = 4.86][C = 19]
18. Aitken SN, **Yeaman S**, Holliday JA, Wang T, Curtis-McLane S. 2008. Adaptation, migration, or extirpation: climate change outcomes for tree populations. *Evolutionary Applications*. 1:95:111. [IF = 4.15][C = 354][Most highly cited paper of all time in journal]
19. Whitlock MC, Davis BH, **Yeaman S**. 2007. The costs and benefits of resource sharing: reciprocity requires resource heterogeneity. *Journal of Evolutionary Biology*. 20:1772-1782. [IF = 3.48][C = 8]
20. Currat M, Excoffier L, Maddison W, Otto SP, Ray N, Whitlock MC, **Yeaman S**. 2006. Comment on "Ongoing adaptive evolution of ASPM, a brain size determinant in Homo sapiens" and "Microcephalin, a gene regulating brain size, continues to evolve adaptively in humans. *Science*. 313:172-173. [IF = 31.03][C = 78]

21. **Yeaman S** and Jarvis A. 2006. Regional heterogeneity and gene flow maintain variance in a quantitative trait within populations of lodgepole pine. *Proceedings of the Royal Society, B*. 273:1587-1593. [IF = 5.68][C = 37]
22. Jarvis A, **Yeaman S**, Guarino L, Tohme J. 2005. The role of geographic analysis in locating, understanding, and using plant genetic diversity. *Methods in Enzymology*. 395:279-298. [IF = 2.00][C = 6]

### **MENTORING AND SUPERVISION**

- Qiushi Li, Postdoctoral Fellow, 2015-present
- Mason Kulbaba, Postdoctoral Fellow, 2015-present
- Yukon Chen, Research Assistant, 2008-2010
- Michelle Wood, Research Assistant, 2008
- Lisa Correia, NSERC Undergraduate Student Research Award, 2008
- Nir Avgay, Research Assistant, 2008
- Brock Glover, Research Assistant, 2007-2008
- Iris Chen, Research Assistant, 2006-2007
- UBC Department of Zoology graduate mentorship program (2007 – 2009)

### **TEACHING EXPERIENCE**

- ConGenOmics course on bioinformatics applications for local adaptation (1-day lecture + workshop; March 2015; Switzerland)
- BIOL 525D. Bioinformatics (two-week co-taught course; January 2015; University of British Columbia)
- Teaching Assistant - Molecular Genetics (2008; University of British Columbia)
- Teaching Assistant - Biometrics (2005, 2006; University of British Columbia)
- Teaching Assistant - Genetics (2007; University of British Columbia)
- Teaching Assistant - Evolutionary Genetics (2005; University of British Columbia)
- Teaching Assistant - Population Genetics (2003; Trent University)
- Guest lecture in Evolution course (BIO 416; University of the Fraser Valley)
- Guest lecture on Genome Evolution (Quest University)
- Class on biology, genetics and the philosophy of science for aboriginal youth at Cedar Summer Science Camp (2005; 2007)
- Workshop: Multivariate data analysis for plant genetic resource purposes, National Institute of Agricultural Research, Lima, Peru (2004)

### **INVITED PRESENTATIONS**

1. University of Uppsala (November 2015) *The architecture of local adaptation: Theoretical predictions and empirical patterns in lodgepole pine and interior spruce.*
2. Canadian Society for Ecology and Evolution (May 2015) *Local adaptation and the evolution of genetic and genomic architecture.*

3. University of Bern (March 2015) *The architecture of local adaptation: transient alleles and long-term genomic repatterning.*
4. Université Laval (November 2014) *The architecture of local adaptation: transient alleles and long-term genomic repatterning.*
5. American Naturalist Vice President's Symposium (June 2014) *Reconciling population and quantitative genetic models of local adaptation: Critical assumptions about genetic architecture.*
6. University of Idaho (November 2013). *Environmental heterogeneity and the genomic architecture of local adaptation.*
7. IUFRO Tree Biotechnology, Asheville NC (May 2013). *The genomic architecture of local adaptation: Theoretical predictions and empirical tests in lodgepole pine and interior spruce.*
8. University of Calgary (January 2013). *Environmental heterogeneity and the architecture of local adaptation.*
9. Simon Fraser University Archaeology Seminar Series. *The evolution of cultural traits: population differentiation and the maintenance of misinformation.* (November 2011)
10. EvolVienna seminar. Vienna, Austria (November 2010). *Some genetic consequences of evolution under migration, selection, and drift.*
11. FoResTTraC Workshop. Saariselkä, Finland (October 2010). *Adaptation to climate change: The maintenance of quantitative genetic variance and evolvability.*

#### **SELECTED CONTRIBUTED PRESENTATIONS**

12. Centre for Molecular Simulation Seminar Series, University of Calgary (November 2015) *The architecture of local adaptation: Theoretical predictions and empirical patterns in lodgepole pine and interior spruce.*
13. Department of Biochemistry and Molecular Biology Seminar Series, University of Calgary (October 2015). *Local adaptation and the evolution of genome architecture: Do clusters of functionally related genes evolve via positive selection?*
14. Plant and Animal Genomes, San Diego (January 2015). *Contrasting genomic signatures of local adaptation in lodgepole pine (*Pinus contorta*) and interior spruce (*Picea glauca* x *Picea engelmannii*).*
15. Forest Genetics. Whistler, British Columbia (July 2013). *Using RNAseq to characterize gene expression in lodgepole pine and interior spruce.*
16. Joint meeting of Evolution societies: SSE/SSB/ASN/CSEE/ESEB. Ottawa, Canada (July 2012). *The importance of genomic rearrangements for the evolution of islands of divergence under migration-selection balance.*
17. Social decision making. Ascona, Switzerland (April 2011). *Network architecture and cultural load.*
18. EEB Seminar. University Neuchâtel, Switzerland (March 2011). *Some genetic consequences of evolution under migration, selection, and drift.*
19. Evolutionary and Ecological Genomics of Adaptation workshop. Fribourg, Switzerland (September 2010). *The genetic architecture of adaptation under migration-selection balance.*
20. Society for the Study of Evolution, Portland, OR (June 2010). *The genetic architecture of adaptation under migration-selection balance.*

21. Evolution in Metapopulations workshop. La Foully, Switzerland (September 2009). *Architecture of multi-locus adaptation under migration-selection balance: allele effect size and number.*
22. European Society for Evolutionary Biology, Turin, Italy (August 2009). *Multi-locus adaptation under migration-selection balance and the accuracy of the Gaussian approximation.*
23. Society for the Study of Evolution, Moscow, ID (June 2009). *No effect of environmental heterogeneity on the maintenance of genetic variation for wing shape in *Drosophila melanogaster*.*
24. Society for the Study of Evolution, Minneapolis, MN (June, 2008). *Overwhelmed by gene flow? A theoretical exploration of adaptive constraint.*
25. Canadian Society for Ecology and Evolution. Vancouver, BC (May 2008). *Explorations at the migration-selection threshold: Evolution in quantitative traits.*
26. Canadian Society for Ecology and Evolution, Toronto, ON (May 2007). *Genetic diversity in heterogeneous environments: Reconciling theoretical predictions and empirical observations.*
27. Evo-Wibo, Port Townsend, WA (April 2006). *Regional heterogeneity and gene flow maintain variance in a quantitative trait within populations of lodgepole pine.*
28. Tree breeders workshop with BC Ministry of Forests and Range (February 2006). *Regional heterogeneity and gene flow maintain variance in a quantitative trait within populations of lodgepole pine.*
29. Society for the Study of Evolution, Fairbanks, AK (June 2005). *Maintenance of diversity in a heterogeneous environment: Landscape predicts variance within populations of lodgepole pine.*

## PROFESSIONAL SERVICE

- Associate Editor for Ecology and Evolution (Wiley-Blackwell)
- Guest Editor for Axios review service
- Reviewer for 27 journals & granting agencies: PNAS; Molecular Ecology; Evolution; Genetics; Proceedings of the Royal Society B; Philosophical Transactions of the Royal Society B; Evolutionary Applications; Genetica; Journal of Evolutionary Biology; American Naturalist; BMC Evolutionary Biology; BMC Biology; Heredity; Journal of Theoretical Biology; Theoretical Population Biology; Journal of Mathematical Biology; Tree Genetics and Genomes; PLoSOne; Annals of Botany; Theoretical and Applied Genetics; Trends in Ecology and Evolution; Molecular Biology and Evolution; Swiss National Science Foundation; Austrian Science Fund; Human Frontier Science Program; Research Foundation–Flanders (FWO), Natural Sciences and Engineering Research Council (Canada).
- Founded the Evolution of Genomic and Genetic Architecture journal club (UBC, 2012-2013)
- Invited expert at European FoResTTraC Workshop on evolutionary response to climate change (Saariselkä, Finland, 2010)
- Organizer for Whistler Forest Genetics (2013), Vancouver Evolution Festival (2009), EEB Evolution Lecture (UBC, 2006), SOWD Lunch research group meetings (UBC, 2005-2006),

- DIRT Lunch seminar series (UBC, 2005-2006)
- Judge: Greater Vancouver Science Fair and Canada Wide Science Fair (2005; 2006)
  - Zoology Department 'Beer Baron' (UBC, 2005-2006)
  - President of the Visiting Researchers group (CIAT, 2003-2004)

#### **TECHNICAL AND COMMUNICATION SKILLS**

- Bioinformatics: extensive experience with RNAseq, sequence capture design, SNP calling (GATK), Linux, PERL, BWA, Trinity, samtools, and many other bioinformatic tools
- R and C++ for statistics and programming, Mathematica for analytical modeling
- Geographical Information Systems (GIS)
- Fluent in Spanish and intermediate fluency in French

#### **RELATED INTERESTS**

- Animation and computer games as a tool for communicating scientific ideas, especially to the general public
- Bio-ethics and regulation of emerging genomic technologies