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## CONTACT

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## EDUCATION

Ph.D. in Zoology (2004), University of Idaho, under the direction of Jack Sullivan  
M.S. in Zoology (2001), Michigan State University, under the direction of Barbara Lundrigan  
B.S. in Zoology (1998), Michigan State University  
B.A. in English (1993), Michigan State University

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## APPOINTMENTS

August 2018 – present: Professor, Department of Evolution, Ecology, and Organismal Biology & Curator of the Tetrapod Collection, Museum of Biological Diversity. The Ohio State University  
August 2014—July 2018: Associate Professor, Department of Evolution, Ecology, and Organismal Biology, The Ohio State University  
August 2012—July 2014: Assistant Professor, Department of Evolution, Ecology, and Organismal Biology, The Ohio State University  
May 2012—August 2012: Associate Professor, Department of Biological Sciences, Louisiana State University.  
August 2007 — May 2012: Assistant Professor, Department of Biological Sciences, Louisiana State University.  
January 2005 — May 2007: Postdoctoral Researcher, Department of Ecology and Evolutionary Biology, University of Michigan (with Lacey Knowles).

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## RESEARCH INTERESTS

Research in the Carstens lab seeks to identify the factors that promote the formation of biodiversity. Our work incorporates species delimitation, evolutionary genetics, biogeography, and community phylogeography to make inferences about the evolutionary history of species ranging from snails and salamanders to carnivorous plants and *Myotis* bats.

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## GRANTS & AWARDS

2018. Dimensions US-BIOTA-Sao Paulo: Traits as predictors of adaptive diversification along the Brazilian Dry Diagonal. (DEB-1831319), \$383,071.  
2017. ABI Innovation: Posterior Predictive Checks of Evolutionary Models (DBI 1661029). \$403,649.  
2016. <sup>9</sup>Dissertation Research: Does phenotypic evidence support ecological speciation in western long-eared *Myotis* bats? (DEB-1701810), \$20,020. March 2017 – February 2018. <sup>9</sup>Ariadna Morales is coPI.

2016. <sup>8</sup>REU site: Next generation Evolutionary Biology. (NSF DBI-1560116), \$425,000. September 2016 – August 2018. <sup>8</sup>Meg Daly is the PI.
2014. <sup>7</sup>Dissertation Research. Inferring the evolutionary history of arthropods associated with pitcher plants using phylogeographic concordance factors (DEB 1501474), \$20,020. <sup>7</sup>Jordan Satler is coPI.
2014. <sup>6</sup>Collaborative Research: Comparative Phylogeographic Approach to Predicting Cryptic Diversity – the Inland Temperate Rainforest as a Model System (DEB-1457519), \$960,796. May 2015—April 2018. <sup>6</sup>Jack Sullivan is the PI; Dave Tank is coPI; OSU budget is \$284,182.
2014. <sup>5</sup>Dissertation Research. Spatial Sorting and Postglacial Population Dynamics in *Plethodon dunni* and *P. vehiculum* (DEB 1403034), \$20,016. May 2014—April 2015. <sup>5</sup>Tara Pelletier is coPI
2014. <sup>4</sup>Connecting new Systematic Biologists across borders: A workshop in model-based phylogenetics at Evolution 2015 (DEB 1500774), \$47,608. <sup>4</sup>Stacey Smith was the PI.
2012. <sup>3</sup>Phylogeographic Inference using Approximate Likelihoods. National Science Foundation (DEB 1257784), \$540,828. March 2013—June 2016. <sup>3</sup>Brian O’Meara was the PI; OSU budget is \$226,828.
2011. <sup>2</sup>US-Mexico workshop on evolutionary genomics of non-model species: next-gen sequencing, data management, hypothesis testing. Irapuato, Mexico. (OISE 1118408), \$49,841. <sup>2</sup>Stacey Lance was PI.
2009. A novel approach to the identification of independent evolutionary lineages. National Science Foundation (DEB 0918212), \$237,643. July 2009 — June 2012.
2009. <sup>1</sup>EAGER: Developing bioinformatics tools for the application of next-generation sequencing technologies to phylogeography. National Science Foundation (DEB 0956069), \$225,394. September 2009 — August 2012. <sup>1</sup>Robb Brumfield was the coPI.
2009. Evolution of the Louisiana pitcher plant and its commensal organisms. Louisiana Board of Regents, \$102,500. July 2009 — June 2011.
2009. Community phylogeography of Louisiana pitcher plants, their inquiline insects, and commensal bacteria. Louisiana State University Faculty Research Program, LSU Office of Research and Economic Development, \$9992.
2008. Genetics of the microbial fauna in the Louisiana Pitcher Plant (*Sarracenia alata*), and identification of the source of *Sarracenia* bacteria. Louisiana EPSCoR - Pfund, \$10,000.
2004. Assessing abundance and genetic diversity in *Dicamptodon aterrimus*. Idaho Department of Fish and Game, \$13,150.
2001. University of Idaho Presidential Fellowship, \$75,000.

## PUBLICATION METRICS

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[Goggle Scholar](#) Citations (6556); h-index (38); *i* 10-index (58)

[Web of Science](#) Citations (4390); h-index (32); Average citations per item (60)

## PUBLICATIONS

*Manuscript(s) currently in the queue*

84. Smith ML, Carstens BC. A machine learning approach to delimiting species with gene flow. *In revision*.
83. Rankin AM, Wilke T, Lucid M, Leonard W, Espindola A, Smith ML, Ruffley M, Tank DC, Carstens BC, Sullivan J. Biogeographic and evolutionary history of the Pacific Northwest: Jumping slugs (*Hemphillia*) as models. *In revision*.
82. Pelletier TA, Carstens BC. Barcoding genes reveal high numbers of cryptic species in bats and demonstrate the need for basic taxonomic research. *In revision*.
81. Sullivan J, Smith ML, Espindola AE, Ruffley MR, Rankin AM, Tank DC, Carstens BC. Integrating life history traits in predictive phylogeography. *In review*.

*Manuscripts in press in peer-reviewed journals*

80. Satler JD, Carstens BC. The *Sarracenia alata* pitcher plant system and obligate arthropod inquilines should be considered an evolutionary community. *Journal of Biogeography*.
79. Pelletier TA, Carstens BC, Tank DC, Sullivan J, Espíndola A. Predicting plant conservation priorities on a global scale. *Proceedings of the National Academy of Sciences USA*.

*2018 publications*

78. Smith ML, Ruffley MR, Rankin A, Espindola A, Tank DC, Sullivan J, Carstens BC. (2018) Testing for the presence of cryptic diversity in the tail-dropper slugs (Genus *Prophysaon*) using molecular data. *Biological Journal of the Linnean Society* 124, 518-532; DOI:10.1093/biolinnean/bly067
77. Morales AE, Carstens BC. Evidence that *Myotis lucifugus* 'subspecies' are five non-sister species, despite gene flow. *Systematic Biology* 67, 756-769. DOI: 10.1093/sysbio/syy010
76. Wheeler GL, Carstens BC. (2018) Evaluating the adaptive evolutionary convergence of carnivorous plant taxa through functional genomics. PeerJ 6:e4322; DOI 10.7717/peerj.4322
75. Ruffley MR, Smith ML, Espíndola AE, Carstens BC, Tank DC, Sullivan J. (2018) Model selection reveals complex phylogeography of Red Alder, *Alnus rubra*, in the Pacific Northwest temperate rainforest. *Molecular Ecology* 27, 1012-1024; DOI:10.1111/mec.14491.
74. Carstens BC, Morales AE, Field KA, Pelletier TA. (2018) A global analysis of bats using automated comparative phylogeography uncovers a surprising impact of Pleistocene glaciation. *Journal of Biogeography* 45, 1795-1805; DOI: 10.1111/jbi.13382
73. Pelletier TA, Carstens BC. (2018) Geographic range size and latitude predict population genetic structure in a global survey. *Biology Letters* 14, 20170566.

*2017 publications*

72. Carstens BC, Morales AE, Jackson ND, O'Meara BC. (2017) Objective Choice of Phylogeographic Models. *Molecular Phylogenetics and Evolution* 116, 136-140. <https://doi.org/10.1016/j.ympev.2017.08.018>.
71. Silva-Arias G, Reck-Kortmann M, Carstens BC, Hasenack H, Bonatto S, Freitas L. (2017) from inland to the coast: spatial and environmental signatures on the genetic diversity in the colonization of the South Atlantic Coastal Plain. *Perspectives in Plant Ecology, Evolution and Systematics* 28, 47-57. DOI: 10.1016/j.ppees.2017.06.006
70. Smith ML, Ruffley MR, Espíndola AE, Tank DC, Sullivan J, Carstens BC. (2017) Demographic model selection using random forests and the site frequency spectrum. *Molecular Ecology* 26, 4562-4573. doi: 10.1111/mec.14223.
69. Satler JD, Carstens BC. (2017) Do ecological communities disperse across biogeographic barriers as a unit? *Molecular Ecology* 26, 3533-3545. DOI: 10.1111/mec.14137
68. Jackson ND, Morales AE, Carstens BC, O'Meara BC. (2017) PHRAPL: Phylogeographic Inference using approximate likelihoods. *Systematic Biology*, in press.
67. Jackson ND, Morales A, Carstens BC, O'Meara BC. (2017) Species delimitation with gene flow. *Systematic Biology* 66, 799-812.
66. Gruenstaeudl M, Carstens BC, Santos-Guerra A, Jansen RK. (2017) Statistical hybrid detection and the inference of ancestral distribution areas in *Tolpis* (Asteraceae). [Biological Journal of the Linnean Society](https://doi.org/10.1093/biolinnean/bly067) 121, 133-149.
65. Morales AE, Jackson ND, Dewey TA, O'Meara BC, Carstens BC. (2017) Speciation with gene flow in North American *Myotis* bats. [Systematic Biology](https://doi.org/10.1093/sysbio/syw100) 66, 440-452. DOI:10.1093/sysbio/syw100

*2016 publications*

64. Espíndola A, Ruffley M, Smith M, Carstens BC, Tank DC, Sullivan J. (2016) Predicting cryptic diversity from phylogeographic, climatic and taxonomic data. [Proceedings of the Royal Society B 283, 20161529](#). DOI:10.1098/rspb.2016.1529
63. Pelletier TA, Carstens BC. (2016) Comparing range evolution in two western *Plethodon* salamanders: Glacial refugia, competition, ecological niches, and spatial sorting. [Journal of Biogeography 43, 2237-2249](#). DOI:10.1111/jbi.12833
62. Thomé MTC, Carstens BC. (2016) Phylogeographic model selection leads to insight into the evolutionary history of Four-eyed frogs. [Proceedings of the National Academy of Sciences USA, 113, 8010-8017](#). DOI:10.1073/pnas.1601064113
61. Carstens BC, Gruenstaeudl M, Reid NM. (2016) Community Trees: Identifying co-diversification in the Páramo dipteran community. [Evolution 70, 1105-1119](#). DOI: 10.1111/evo.12916
60. Perez MF, Carstens BC, Rodrigues GL, Moraes EM (2016) Anonymous nuclear markers reveal taxonomical incongruences and long-term disjunction in a cactus species complex with continental-island distribution in South America. [Molecular Phylogenetics and Evolution 95, 11-19](#). DOI:10.1016/j.ympev.2015.11.005
59. Thomé MCT, Brusquetti F, Sequeira F, Carstens BC, Haddad CFB, Rodrigues MT, Alexandrino J (2016) Recurrent connections between Amazon and Atlantic forests shaped diversity in Caatinga Four-Eyed frogs. [J. Biogeography 43, 1045-1056](#). DOI:10.1111/jbi.12685
58. Satler JD, Carstens BC. (2016) Phylogeographic concordance factors quantify phylogeographic congruence among co-distributed species. [Evolution 70, 1080-1093](#). DOI: 10.1111/evo.12924
57. Perez MF, Bonatelli IAS, Moraes E, Carstens BC. (2016) Refining phylogeographic inference in two interglacial microrefuge-dwelling cactus species using model-based analysis. *Journal of Heredity* 116, 550-557.
56. Sovic MG, Carstens BC, Gibbs HL (2016) Genetic diversity in migratory bats: Results from RADseq data for three tree bat species at a wind farm in northwestern Ohio. [PeerJ 4:e1647](#); DOI:10.7717/peerj.1647
55. Gruenstaeudl M, Reid NM, Wheeler G, Carstens BC (2016) Posterior predictive checks of coalescent models: P2C2M, an R package. [Molecular Ecology Resources 16, 193-205](#). DOI: 10.1111/1755-0998.12435
54. Satler JD, Zellmer AJ, Carstens BC (2016) Biogeographic barriers drive co-diversification within associated eukaryotes of the *Sarracenia alata* pitcher plant system. [PeerJ 4:e1576](#). DOI:10.7717/peerj.1576
53. Perez MF, Carstens BC, Rodrigues GL, Moraes EM (2016) Anonymous nuclear markers data supporting species tree phylogeny and divergence time estimates in a cactus species complex in South America. [Data in Brief 6, 456-460](#). DOI:10.1016/j.dib/2015.12.002

#### 2015 Publications

52. Bonatelli IAS, Carstens BC, Moraes EM (2015) Using next generation RAD sequencing to isolate multispecies microsatellites for *Pilosocereus* (Cactaceae) genus. [PLoS ONE 10: e0142602](#). DOI:10.1371/journal.pone.0142602
51. Hird SM, Sanchez C, Carstens BC, Brumfield RT (2015) Comparative gut microbiota of 59 Neotropical bird species. [Frontiers in Microbiology 6, 1403](#). DOI:10.3389/fmicb.2015.01403
50. Pelletier TA, Crisafulli C, Wagner S, Zellmer AJ, Carstens BC. (2015) Historical species distributions predict species limits. [Systematic Biology 64, 909-925](#).
49. McVay JD, Flores-Villela O, Carstens BC (2015) Diversification of North American Natricine snakes. [Biological Journal of the Linnean Society 116, 1-12](#).
48. Garrick RC, Bonatelli IAS, Morales AE, Pelletier TA, Perez MF, Rice E, Satler JD, Symula RE, Thomé MTC, Carstens BC (2015) The evolution of phylogeographic datasets. [Molecular Ecology 24, 1164-1171](#).

*2014 Publications*

47. Espindola A, Carstens BC, Alvarez N. (2014) Comparative phylogeography of mutualists and the effect of the host on the genetic structure of its partners. [Biological Journal of the Linnean Society 113, 1021-1035](#).
46. Gavin DG, Fitzpatrick MC, Gugger PF, Heath KS, Rodriguez-Sanches F, Dobrowski SZ, Hampe A, Hu FS, Ashcroft MB, Bartlein PJ, Blois JL, Carstens BC, Davis EB, de Lafontaine G, Edwards ME, Fernandez M, Henne PD, Herring RM, Holden ZA, Kong W-S, Liu J, Magri D, Matzke NJ, McGlone MS, Salter F, Stigall AL, Tsai Y-H E, Williams JW. (2014) Climate refugia: Using fossils, genetics, and spatial modeling to explain the past and project the future of biodiversity. [New Phytologist 204, 37-54](#).
45. Pelletier TA, Carstens BC. (2014) Model choice in phylogeography using a large set of models. [Molecular Ecology 23, 3028-3043](#).
44. Hird SM, Carstens BC, Cardiff SW, Dittman DL, Brumfield RT. (2014) Sampling locality is more important than taxonomy or ecology in the gut microbiota of the brood-parasitic Brown-Headed Cowbird (*Molothrus ater*). [PeerJ 2; e21](#).
43. Reid NM, Brown JM, Satler JD, Pelletier TA, McVay JD, Hird SM, Carstens BC. (2014) Poor fit to the multi-species coalescent model is widely detectable in empirical data. [Systematic Biology 63, 322-333](#).

*2013 Publications*

42. Carstens BC, Brennan RS, Chua V, Duffie CV, Harvey MG, Koch RA, McMahan CD, Nelson BJ, Newman CE, Satler JD, Seeholzer G, Prosbic K, Tank DC, Sullivan J (2013) Model selection as a tool for phylogeographic inference: An example from the willow *Salix melanopsis*. [Molecular Ecology 22, 4014-4028](#).
41. Carstens BC, Satler JD. (2013) The carnivorous plant described as *Sarracenia alata* contains two cryptic species. [Biological Journal of the Linnean Society 109, 737-746](#).
40. Carstens BC, Pelletier TA, Reid NM, Satler JD (2013) How to fail at species delimitation. [Molecular Ecology 22, 4369-4383](#).
39. Salter JD, Carstens BC, Hedin M (2013) Multilocus species delimitation in a complex of morphologically conserved trapdoor spiders (Mygalomorphae, Antrodiaetidae, *Aliatypus*). [Systematic Biology 62, 805-823](#).
38. McVay JD, Carstens BC (2013) Phylogenetic model choice: Justifying a species trees or concatenation analysis. *Phylogenetics and Evolutionary Biology* 1, 1000114.
37. Andrew R, Bernatchez L, Bonin Z, Buerkle CA, Carstens BC, Emerson BC, Garant D, Giraud T, Kane NC, Rogers SM, Slate J, Smith H, Sork VL, Stone GN, Vines TH, Waits LS, Widmer A, Rieseberg LH (2013) A Roadmap for Molecular Ecology. [Molecular Ecology 22, 2605-2626](#).
36. McVay JD, Carstens BC. (2013) Testing monophyly without well-supported gene trees: Evidence from multi-locus nuclear data conflicts with existing taxonomy in the snake tribe Thamnophiini. [Molecular Phylogenetics & Evolution 68, 425-431](#).
35. McCormack JE, Hird SM, Zellmer AJ, Carstens BC, Brumfield RT (2013). Applications of next-generation sequencing to phylogeography and phylogenetics. [Molecular Phylogenetics and Evolution 66, 526-538](#).
34. Tsai Y-H E, Carstens BC (2013) Assessing model fit in phylogeographic investigations: An example from the North American willow *Salix melanopsis*. [Journal of Biogeography 40, 131-141](#).

*2012 Publications*

33. Reid NM, Carstens BC (2012). Phylogenetic estimation error can decrease the accuracy species delimitation: A Bayesian implementation of the General Mixed Yule Coalescent model. [BMC Evolutionary Biology 12, 196, 1-11.](#)
32. Carstens BC, Lemmon AR, Moriarty-Lemmon E (2012). The promises and pitfalls of next-generation sequencing data in phylogeography. [Systematic Biology 61, 713-715.](#)
31. Zellmer AJ, Hanes MM, Hird S, Carstens BC. (2012). Deep phylogeographic structure and environmental differentiation in the carnivorous plant *Sarracenia alata*. [Systematic Biology 61, 763-777.](#)

*2008-2011 Publications (research at Louisiana State University)*

30. Hird SM, Brumfield RT, Carstens BC (2011). PRGMATIC: an efficient pipeline for collating genome-enriched second-generation sequencing data using a 'provisional reference genome'. [Molecular Ecology Resources 11, 743-748.](#)
29. Ence DD, Carstens BC (2011). SpedeSTEM: A rapid and accurate method for species delimitation. [Molecular Ecology Resources 11, 473-480.](#)
28. Koopman MM, Carstens BC (2011) Plant genetic divergence predicts microbial community structure: Molecular *phylogeography* of carnivorous pitcher plants. [Microbial Ecology 61, 750-758.](#)
27. Carstens BC, Dewey TA (2010) Species delimitation using a combined coalescent and information theoretic approach: An example from North American *Myotis* bats. [Systematic Biology 59, 400-414.](#)
26. Hird S, Kubatko L, Carstens BC (2010) Replicated subsampling enables accurate species tree estimation in empirical systems. [Molecular Phylogenetics & Evolution 57, 888-898.](#)
25. Koopman MM, Carstens BC (2010) Conservation genetic inferences in the carnivorous plant *Sarracenia alata* (Sarraceniaceae). [Conservation Genetics 11, 2027-2038.](#)
24. Koopman MM, Fuselier DM, Hird S, Carstens BC (2010) Bacterial characterization of the carnivorous Pale Pitcher Plant reveals diverse, distinct, and temporally dependent communities. [Applied and Environmental Microbiology 76, 1851-1860.](#)
23. Hickerson MJ, Carstens BC, Cavender-Bares J, Crandall KA, Graham CH, Johnson JB, Rissler L, Victoriano PF, Yoder AD (2010) Phylogeography's past, present, and future: 10 years after Avise 2000. [Molecular Phylogenetics & Evolution 54, 291-301.](#)
22. Carstens BC, Stoute HN, Reid NM (2009) An information theoretical approach to phylogeography. [Molecular Ecology 18, 4270-4282.](#)
21. Koopman MM, Gallagher E, Carstens BC (2009) Isolation and characterization of nine microsatellite loci in the Pale Pitcher Plant *Sarracenia alata* (Sarraceniaceae). [Molecular Ecology Resources 9, 1460-1466.](#)
20. Cantrell M, Carstens BC, Wichman HA (2009) X Chromosome Inactivation and XIST Evolution in a Rodent Lacking LINE-1 Activity. [PLoS One 4, e6252.](#)
19. Kubatko L, Carstens BC, Knowles LL (2009) STEM: Species tree estimation using maximum likelihood for gene trees under coalescence. [J. Bioinformatics 25, 971-973.](#)
18. Eckert AJ, Carstens BC. (2008) Does gene flow destroy phylogenetic signal? The performance of three methods for estimating species phylogenies in the presence of gene flow. [Molecular Phylogenetics & Evolution 49, 832-842.](#)

*2006-2007 Publications (postdoctoral research)*

17. Carstens BC, Knowles LL (2007) Estimating phylogeny from gene tree probabilities in *Melanoplus* grasshoppers despite incomplete lineage sorting. [Systematic Biology 56, 400-411.](#)
16. Carstens BC, Richards CL (2007) Integrating coalescent and ecological niche modeling in comparative phylogeography. [Evolution 61, 1439-1454.](#)
15. Carstens BC, Knowles LL (2007) Shifting distributions and speciation: genomic resolution of species divergence during rapid climate change. [Molecular Ecology 16, 619-627.](#)

14. Knowles LL, Carstens BC (2007) Delimiting species without monophyletic gene trees. [Systematic Biology 56, 887-895.](#)
13. Richards CL, Carstens BC, Knowles LL (2007) Distribution modeling and statistical phylogeography: an integrative framework for generating and testing alternate biogeographical hypotheses. [J. Biogeography 34, 1833-1845.](#)
12. Knowles LL, Carstens BC, Keat ML (2007) Coupling genetic and ecological-niche models to examine how past population distributions contribute to divergence. [Current Biology 17, 1-7.](#)
11. Brunsfeld SJ, Miller TR, Carstens BC (2007) Insights into the biogeography of the Pacific Northwest of North America: Evidence from the phylogeography of *Salix melanopsis* (Salicaceae). [Systematic Botany 32, 129-139.](#)
10. Knowles LL, Carstens BC (2007) Estimating a population-divergence model for statistical phylogeographic tests in montane grasshoppers. [Evolution 61, 477-493.](#)
9. Carstens BC, Knowles LL (2006) Variable nuclear markers for *Melanoplus oregonensis* identified from the screening of a genomic library. [Molecular Ecology Notes 6, 683-685.](#)

*2000-2004 Publications (graduate school)*

8. Carstens BC, Brunsfeld SJ, Demboski JR, Good JD, Sullivan J (2005) Investigating the evolutionary history of the Pacific Northwest mesic forest ecosystem: Hypothesis testing within a comparative phylogeographic framework. [Evolution 59, 1639-1652.](#)
7. Carstens BC, Degenhardt JD, Stevenson AL, Sullivan J (2005) Accounting for coalescent stochasticity in testing phylogeographic hypotheses: Modeling Pleistocene population structure in the Idaho Giant Salamander *Dicamptodon aterrimus*. [Molecular Ecology 14, 255-265.](#)
6. Carstens BC, Bankhead III A, Joyce P, Sullivan J (2005) Testing population genetic structure using parametric bootstrapping. [Genetica 124, 71-75.](#)
5. Steele CA, Carstens BC, Storfer A, Sullivan J (2005) Testing hypotheses of speciation timing in *Dicamptodon copei* and *Dicamptodon aterrimus* (Caudata: Dicamptodontidae). [Molecular Phylogenetics & Evolution 36, 90-100.](#)
4. Johnson DG, Carstens BC, Sheppard WS, Zack RS (2005) Phylogeny of the leafhopper subgenus *Errhomus* (*Erronus*) (Hemiptera: Homoptera: Cicadellidae) based on mitochondrial DNA sequences. [Annals of the Entomological Society of America 98, 165-172.](#)
3. Carstens BC, Stevenson AL, Degenhardt JD, Sullivan J (2004) Testing nested phylogenetic and phylogeographic hypotheses in the *Plethodon vandykei* species group. [Systematic Biology 53, 781-792.](#)
2. Carstens BC, Sullivan J, Davalos LM, Larsen PA, Pedersen SC (2004) Exploring population genetic structure in three species of Lesser Antillean bats. [Molecular Ecology 13, 2557-2566.](#)
1. Carstens BC, Lundrigan BL, Myers P (2002) A phylogeny of the Neotropical nectar-feeding bats (Chiroptera: Phyllostomidae) based on morphological and molecular data. [Journal of Mammalian Evolution 9, 23-53.](#)

*Book Chapters, Invited Commentaries, and other works*

6. Smith ML, Carstens BC. Disentangling the process of speciation using machine learning. [bioRxiv: https://doi.org/10.1101/356345.](https://doi.org/10.1101/356345)
5. Carstens BC. (2018) Review of Species Concepts in Biology: Historical Development, Theoretical Foundations and Practical Relevance by Frank E. Zachos. Quarterly Review of Biology 93, 36.
4. O'Meara BC, Jackson ND, Morales AE, Carstens BC (2015). Phylogeographic Inference using approximate likelihoods. [bioRxiv: http://biorxiv.org/content/early/2015/08/24/025353](http://biorxiv.org/content/early/2015/08/24/025353)
3. Carstens BC (2013) [Phylogeography](#). Oxford Bibliographies, invited contribution.

2. Carstens BC, Knowles LL (2010) Navigating the Unknown: Model selection in phylogeography. *Molecular Ecology* 19, 4581-4582.
1. Fleming TH, Murray KL, Carstens BC (2010) Phylogeography and Genetic Structure of Three Evolutionary Lineages of West Indian Phyllostomid Bats. Chapter 5 in *Evolution, Ecology, and Conservation of Island Bats*, T.H. Fleming and P.A. Racey, eds. Univ. Chicago Press.

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 INVITED TALKS
 

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- 2017 'Big data for global inferences in biodiversity science.' Ohio Supercomputer Center, State Users Group Meeting. September 18, 2017.
- 2017 'Big data for global inferences in biodiversity science.' Department of Biological Sciences, University of Idaho.
- 2017 'Big data for global inferences in biodiversity science.' Pymatuning Lab of Ecology, University of Pittsburgh.
- 2017 'Evolution of (and in) the carnivorous plant *Sarracenia alata*.' Center for Applied Plant Sciences, The Ohio State University.
- 2016 'Evolution of (and in) the carnivorous plant *Sarracenia alata*.' Department of Horticulture and Crop Sciences, The Ohio State University.
- 2016 'Phylogeographic model selection leads to insight into the evolutionary history of four-eyed frogs.' In the Light of Evolution X: Comparative Phylogeography. Arthur M. Sackler Colloquia of the National Academy of Sciences.
- 2015 'Phylogeography and biodiversity', 5th Biological Evolution Workshop (PABEW) in Porto Allegre, Brazil.
- 2015 'Speciation with gene flow in *Myotis* bats', Department of Biology, University of Texas-Arlington.
- 2015 'Gene flow should be explicitly modeled (rather than ignored) in species delimitation investigations that utilize genetic Data.' Species Delimitation in the Age of Genomics, Center for Biodiversity Analysis, Australian National University.
- 2015 'Introduction to Phrapl and P2C2M: R modules for assessing phylogeographic model fit.' Species Delimitation in the Age of Genomics, Center for Biodiversity Analysis, Australian National University.
- 2015 'What can we learn from genetic data.' Ohio Bat Working Group, Annual Meeting.
- 2014 'Evolution of the carnivorous plant *Sarracenia alata*.' Center for Applied Plant Science, The Ohio State University.
- 2014 'Model selection as a tool for inference in phylogeographic research.' IX Coloquio Estudiantil "Filogeografía y Biogeografía: retos para el siglo XXI" INECOL, Xalapa, Mexico.
- 2014 'The stories that we tell ourselves about our phylogeographic data.' Texas Tech University, Department of Biological Sciences.
- 2013 'Model selection as a tool for inference in Evolutionary Genetics.' University of Alaska-Fairbanks, Department of Biology and Wildlife.
- 2012 Community Phylogeography in the carnivorous plant *Sarracenia alata*.' University of Georgia, Department of Genetics.
- 2012 'Model selection as a tool for inference.' First Joint Congress on Evolutionary Biology, Molecular Ecology Symposium.
- 2012 'Species delimitation using Species Trees.' Estimating Species Trees Workshop, The Ohio State University.
- 2011 'Community Phylogeography in the carnivorous plant *Sarracenia alata*.' University of Vermont, Department of Biology.
- 2011 'The Promises and Pitfalls of Next-generation Sequencing in Phylogeography.' Evolution Annual Meeting, Society for Systematic Biology symposium.



2011. 'Next generation sequencing allows identification of the timing and causes of diversification in the carnivorous plant *Sarracenia alata*.' American Genetics Association Annual Meeting, invited symposium.
- 2011 'Generating (and Testing) Hypotheses in Comparative Phylogeography.' Trinity University, Department of Biology.
- 2011 'Generating (and Testing) Hypotheses in Comparative Phylogeography.' University of Texas-Austin, Integrative Biology Department.
- 2010 'Species delimitation using Species Trees.' NIMBios Working Group, Knoxville, TN.
- 2010 'Community Phylogeography in the carnivorous plant *Sarracenia alata*.' BIOTA-FAPESP International Symposium on Phylogeography, São Paulo, Brazil.
- 2010 'Community Phylogeography in the carnivorous plant *Sarracenia alata*.' University of Mississippi, Department of Biology.
- 2010 'Community Phylogeography in the carnivorous plant *Sarracenia alata*.' Southeastern Louisiana University, Department of Biology.
- 2009 'Generating (and Testing) Hypotheses in Comparative Phylogeography.' Florida State University, Department of Biological Sciences.
- 2009 'Community Phylogeography in the carnivorous plant *Sarracenia alata*.' University of Minnesota, Department of Ecology and Evolutionary Biology.
- 2009 'Community Phylogeography in the carnivorous plant *Sarracenia alata*.' University of South Alabama, Department of Biology.
- 2008 'Generating (and Testing) Hypotheses in Comparative Phylogeography.' University of New Mexico, Department of Biology.
- 2008 'Generating (and Testing) Hypotheses in Comparative Phylogeography, Virginia Commonwealth University, Department of Biology.
- 2008 'Species limits in *Myotis* bats.' Merging Phylogenetic Biology and Spatial Ecology Symposium, Evolution Annual Meeting, Minneapolis, MN.
- 2008 'Phylogeography of Western North America.' Comparative Phylogeography Symposium, Botany Annual Meeting.
- 2008 'Generating (and Testing) Hypotheses in Comparative Phylogeography.' Nescent-PIRE, Durham, NC.
- 2007 'Generating (and Testing) Hypotheses in Comparative Phylogeography.' University of New Orleans, Department of Biological Sciences.

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 CONTRIBUTED TALKS

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 2017 Contributions

- Pelletier TA, Carstens BC. Barcoding Genes Reveal High Numbers of Cryptic Species in Bats. 2017 North American Society for Bat Research Meeting; Knoxville, TN.
- Wieringa, J.G.\*, Gibbs, H.L., and Carstens, B.C. Trace elements as a method for sourcing migratory Tree Bats. Presentation, North American Society for Bat Research, Knoxville, TN, October 2017.
- Wieringa, J.G.\*, Gibbs, H.L., and Carstens, B.C. Trace elements as a method for sourcing migratory Tree Bats. Rapid talk. Student Conference on Conservation Science, AMNH, New York, NY, October 2017.
- Carstens BC\*, Morales AE, Pelletier TA. Do Organismal Traits or Species Range Attributes Offer the Best Predictions of How Species Respond to Climate Change? 2017 North American Society for Bat Research Meeting; Knoxville, TN.
- Morales AE\*, Carstens BC. Genomic Evidence That *Myotis lucifugus* 'Subspecies' Are Five Non-sister Species, Despite Gene Flow. 2017 North American Society for Bat Research Meeting; Knoxville, TN.
- Morales AE\*, Carstens BC. Gene flow interferes with phylogenetic signal: *Myotis lucifugus* subspecies are five non-sister species. 2017 SSB Meeting, Baton Rouge, LA

Carstens BC\*, Pelletier TA. Big Data for Phylogeography. 2017 SSB Meeting, Baton Rouge, LA  
 Smith ML\*, Carstens BC, Tank DC, Sullivan J, Ruffley MA, Espíndola A. Species limits and relationships within tail-dropper slugs (genus *Prophysaon*) from the Pacific Northwest.  
 Espíndola A, Pelletier TA, Carstens BC, Sullivan J, Tank DC. Predictive methods for conservation prioritization.  
 Morales AE\*, Jackson N, O'Meara BC, Carstens BC. Unraveling the effects of gene flow on species limits and phylogenetic signal in *Myotis* bats. 2017 Evolution Meeting, Portland, OR.

#### 2016 Contributions

Carstens BC\*, Morales AE, Pelletier TA. Phylogeographic meta-analysis into global patterns of genetic variation. 2016 Evolution meeting, Austin, TX.  
 Espíndola A\*, Ruffley M, Smith ML, Tank DC, Carstens BC, Sullivan J. Predicting cryptic diversity from phylogeographic, climatic and taxonomic data. 2016 Evolution meeting, Austin, TX.  
 Morales AE\*, Jackson N, O'Meara BC, Carstens BC. Speciation with gene flow in North American *Myotis* bats. 2016 Evolution meeting, Austin, TX.  
 Satler JD\*, Carstens BC. Testing for co-diversification in an ecological community: an example from the *Sarracenia alata* pitcher plant system. 2016 Evolution, Austin, TX.  
 Smith ML\*, Ruffley M, Espíndola A, Tank DC, Sullivan J, Carstens BC. Testing models of colonization in the robust lancetooth snail (*Haplotrema vancouverense*) from the Pacific Northwest using Approximate Bayesian Computation and the Site Frequency Spectrum. 2016 Evolution, Austin, TX.  
 Ruffley M\*, Espíndola A, Smith ML, Carstens BC, Tank DC, Sullivan J. Phylogeography of *Alnus rubra* in the Pacific Northwest temperate rainforest. 2016 Evolution meeting, Austin, TX.

#### 2015 Contributions

Carstens BC\*. Evolutionary models and the OSC. 2015 Statewide Users Group Meeting of the Ohio Supercomputer Center.  
 Morales-Garcia AE\*, ND Jackson, BC O'Meara, BC Carstens. *Myotis* divergence with migration. 2015 North American Society for Bat Research, Monterey, CA.  
 Carstens BC\*, Morales-Garcia AE, Jackson ND, O'Meara BC. 2015. Gene flow should be explicitly modeled (rather than ignored) in species delimitation investigations that utilize genetic Data. Evolution Annual Meeting.  
 Morales-Garcia AE\*, Carstens BC. Species delimitation of western long-eared *Myotis* bats using approximated likelihood. Society of Systematic Biologists Annual Meeting.

#### 2014 Contributions

Satler JD\*, Carstens BC. Do ecological communities co-diversify? An investigation into the *Sarracenia alata* pitcher plant system. Evolution Annual Meeting, Raleigh, NC.  
 Gruenstaeudl M, Carstens BC, Jansen R, Santos-Guerra A. Hybrid taxa can mislead phylogeographic analyses in *Tolpis* (Asteraceae). Evolution Annual Meeting, Raleigh, NC.  
 Jackson ND, Morales-García AE, Carstens BC, O'Meara BC. Phylogeographic model selection using approximated likelihoods. Evolution Annual Meeting, Raleigh, NC.

#### 2013 Contributions

Pelletier TA\*, Zellmer AJ, Carstens BC. Using ecological niche models to predict species boundaries. Evolution Annual Meeting, Snowbird, Utah.  
 O'Meara BC, Carstens BC. Simulated likelihood for species delimitation and phylogeography. Evolution Annual Meeting, Snowbird, Utah.

Carstens BC\*. SpedeSTEM 2.0: New, improved & more fun than ever. Evolution Annual Meeting, Snowbird, Utah.

Reid NM\*, Carstens BC. What can we learn from sequence-based species discovery? An example using sky island fly communities. Evolution Annual Meeting, Snowbird, Utah.

Hird SM\*, Carstens BC, Brumfield RT. Nature, nurture and the gut microbiota in the brood parasitic Brown-headed Cowbird. Evolution Annual Meeting, Snowbird, Utah.

#### 2012 Contributions

Hird SM\*, Carstens BC, Brumfield RT. Using gut microbiota to explore ecology and evolution in Neotropical birds; Evolution Annual Meeting, Ottawa, Ontario, Canada.

Hird SM\*, Carstens BC and RT Brumfield. Gut microbiota of an avian brood parasite (*Molothrus ater*) and nine potential host species; Ecology and Evolution of Host-associated Microbiota Workshop, Basel, Switzerland.

Pelletier TA\*, Carstens BC. Piecing together demographic models: an example from *Plethodon idahoensis*. Evolution Annual Meeting, Ottawa, Ontario, Canada.

Satler JD\*, Carstens BC. Species delimitation in the carnivorous plant species *Sarracenia alata*. Evolution Annual Meeting, Ottawa, Ontario, Canada.

Reid NM\*, Hird SM, Satler J, Pelletier TA, McVay JD, Brown J, and BC Carstens. Do multispecies coalescent models fit empirical data? Society of Systematic Biology Symposium. Evolution Annual Meeting, Ottawa, Ontario, Canada.

#### 2011 Contributions

Reid NM\*, BC Carstens. A Bayesian implementation of the mixed Yule-coalescent model for species delimitation. Talk. Evolution Annual Meeting. Norman, OK, USA.

Reid NM\*, Koopman MM, Zellmer AJ, and BC Carstens. Integrating over taxonomic and phylogenetic uncertainty in analyses of phylogenetic community structure in the fluid of the pale pitcher plant (*Sarracenia alata*). Talk. Ecological Society of America Annual Meeting. Austin, TX, USA.

Hird SM\*, Brumfield RT and BC Carstens. Creating and using a provisional-reference genome from anonymous next-gen fragments using PRGmatic; Society for the Study of Evolution, Norman, OK, USA.

Zellmer AJ\*, Carstens BC. Testing for local adaptation in carnivorous plant populations using global climate data and next-generation sequencing. Evolution Annual Meeting, Norman, Oklahoma, USA.

#### 2010 Contributions

Hird SM\*, Koopman MM, Ence DD, Brumfield RT and BC Carstens. An Efficient Pipeline for the Preparation of Phylogeographic Data Collected Via Next-Generation Sequencing; Society for the Study of Evolution, Portland, OR, USA.

Zellmer AJ\*, Koopman M, Carstens BC. Community phylogeography in a carnivorous plant. Evolution Annual Meeting, Portland, OR.

Pelletier TA\*, Carstens BC. Demographic model selection in a terrestrial salamander. Evolution Annual Meeting, Portland, OR.

Carstens BC\*, Koopman M, Hird SM. Analysis of phylogeographic data collected via next-generation sequencing in the carnivorous plant *Sarracenia alata*. Evolution Annual Meeting, Portland, OR.

#### 2009 Contributions

McVay JD\*, Carstens BC. A comparison of methods for estimating species phylogenies from gene trees: An example from *Thamnophis*. Evolution Annual Meeting, Moscow, ID.

Koopman M\*, Carstens BC. Genetics of the Louisiana pitcher plant community. Evolution Annual Meeting, Moscow, ID.

\*indicates presenter

**PROFESSIONAL ORGANIZATIONS**


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*Professional organizations:* Program Chair (2010-2013), Society of Systematic Biologists, Executive Vice President (2014-2016), Society of Systematic Biologists.

*Associate Editor:* Molecular Ecology (2010-present), Molecular Ecology Resources (2012-present)

*Editorial Review Board:* Systematic Biology (2010-present).

*Reviews provided for:* American Midland Naturalist, American Museum Novitates, American Naturalist, Bioinformatics, Biological Conservation, Biological Journal of the Linnean Society, BMC Evolutionary Biology, Evolution, Gene, Genetica, Genome Biology, Journal of Biogeography, Journal of Heredity, Journal of Mammalogy, Journal of Mammalian Evolution, Journal of Molecular Evolution, Molecular Ecology, Molecular Biology & Evolution, Molecular Phylogenetics & Evolution, Occasional Papers of the Museum of Texas Tech University, PeerJ, Proceedings of the National Academy of Sciences USA, Proceedings of the Royal Society of London (B), Science, Systematic Biology.

**TEACHING**


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2017. EEOB 4220: Evolution and Ecology of Mammals (67 students in 4 sections)  
 2016. ARTSSCI 1137: Biology of Sex Freshman Seminar (15 students in 1 section)  
 2016. EEOB 3310H: Evolution (Honors Section) (26 students in 1 section)  
 2016. EEOB 4220: Evolution and Ecology of Mammals (68 students in 4 sections)  
 2015. EEOB 3310: Evolution (240 students in 16 sections)  
 2015. EEOB 4220: Evolution and Ecology of Mammals (78 students in 4 sections)  
 2014. EEOB 3310H: Evolution (Honors Section)  
 2014. EEOB 4220: Evolution and Ecology of Mammals (62 students in 3 sections)  
 2014. Organized and led a 10-day course at the Universidade Estadual de Campinas in Campinas, Brasil titled "Model-based Phylogeography".  
 2013. Organized and led a week-long course at the Universidad Nacional del Comahue in Bariloche, Argentina titled "Next-Generation Sequencing: State-of-the-art applications for population genetics and phylogeography" (with Brant Faircloth).  
 2010, 2012. BS 7800: Computational Phylogeography, LSU.  
 2011-2008. BS 3040: Evolution, Communications Intensive Section, LSU.  
 2009. BS 7046: Current topics in Molecular Evolution Seminar, LSU.  
 2009. BS 4299: Genetics of the Evolutionary Process, LSU.  
 2009, 2010. Statistical Phylogeography Workshop, American Museum of Natural History Southwestern Field Station (with Mike Hickerson and Naoki Takebayashi).  
 2008. BS 7901: Ecological Niche Modeling Seminar, LSU.  
 2007. BS 3040: Evolution, LSU.  
 2003. Teaching Assistant. Principles of Systematic Biology, UI.  
 2001. Teaching Assistant. Center for Integrated Biological Sciences, MSU.  
 2000-1998. Teaching Assistant. Biological Sciences, MSU.  
 1998-1996. Education Specialist. Organization for Bat Conservation.

**Service**


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*Graduate Committees*

LSU: Andres Cuervo; Melissa Debiasse; Haw-Chaun Lim; Carlos Prada; Eric Rittmeyer.

OSU: Yuan Tian; Matt Holding; Robb Denton; Ben Titus; Ann Gregory; Rosa Rodriguez Pena; Naava Honer; Paula Lado-Henaise; Paul Blishak.

Other Universities: Evan Wong (U Cincinnati); Jenna Hamlin (UGA); Rafael Leite (BYU); Dan Gates (UNL).

#### *Departmental Service*

EEOB Search Committee Chair, Integrative Vertebrate Biologist search, August 2016-February 2017.

EEOB Advisory Committee. August 2014 – May 2016.

Graduate Admissions Committee Chair, The Ohio State University EEOB. August 2014 – May 2016.

Integrative Vertebrate Biologist Search Committee Chair, The Ohio State University EEOB. October 2016– February 2017.

Moser Chair Search Committee Member, The Ohio State University EEOB. October 2014 – February 2015.

Phylogenetic Biology Search Committee Member, Louisiana State University Biology. October 2010-January 2011.

#### *Arts and Sciences College Service*

Arts & Sciences Honors Committee, The Ohio State University EEOB. August 2015-present.

#### *University Service*

Ohio Supercomputer Center, Allocations Committee. April 2016-present.

Genomics Oversight Committee, January 2017-present.

MSBC Oversight Committee, January 2017-present.

Research Security Working Group, February 2017-present.

### MENTORING

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#### *Post-doctoral researchers:*

Tara A. Pelletier, big data phylogeography (January 2016—present).

Michael Gruenstaedl, methods for posterior predictive simulation (February 2014—April 2015).

Tereza Thomé, phylogeography of Brazilian frogs (September 2013—February 2015).

Amanda Zellmer, genetics of *Sarracenia alata* (February 2010—May 2011).

Erica Tsai, phylogeographic methods (February 2010—June 2012).

Margaret M. Koopman, microbiome and genetics of *S. alata* (August 2008—May 2010).

#### *Former Graduate Students and Dissertation Title:*

Sarah Hird (co-advised), Ph D. Novel Computational Tools and Utilization of the Gut Microbiota for Phylogeographic Inference. (July 2009—May 2013).

John D. McVay, Ph D. Molecular Phylogenetics of the North American Snake Tribe *Thamnophiini*. (August 2008—July 2013).

Noah Reid, Ph D. Model-based Approaches to Discovering Diversity: New Implementations, Tests of Adequacy and an Empirical Application to Central American Diptera. (August 2008—July 2013).

Tara Pelletier, Species Delimitation in Western *Plethodon* salamanders. (June 2009—May 2015).

Jordan D. Satler, Community Phylogeography of *Sarracenia*-associated Arthropods. (August 2011—July 2016).

Ariadna E. Morales, The evolutionary history of the bat genus *Myotis*, with emphasis on North American species. (August 2013—July 2018).

Gregory Wheeler, Plant carnivory and the evolution of novelty in *Sarracenia alata*. (August 2014—July 2018).

*Current Graduate Students:*

Megan Smith, Comparative phylogeography methods. (August 2015—present).

Jamin Wieringa (co-advised with HL Gibbs), Bat conservation genetics. (August 2016—present).

Colleen Thompson, Mammal conservation genetics. (May 2017 – present).

Drew J. Duckett

Flavia M. Lanna

Danielle Parsons

*Current Undergraduate Students:*

Ivy Larkin. *Sarracenia* phylogenetics.

Jesse Wallace. Leaf litter invertebrates.

David Sneddon. Microsnails.

Connor Lang. Microsnails.

*Publications with undergraduate students:*

Jeremiah Degenhardt, Angela Stevenson, Peter Larsen, Marcia Keat, Elizabeth Gallagher, Holly Stoute, Danielle Fuselier, Edwin Rice, Katy Field.

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## FIELD EXPERIENCE

Collecting plant and environmental microbe samples, basic ecological field methods, surveying amphibians in the Pacific Northwest, behavioral ecology of ground squirrel populations in the Sierra Nevada Mountains, handling and preparing a variety of amphibians, reptiles and small mammals, mist-netting bats in Michigan.

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## OUTREACH

Provided tours of lab and greenhouse space for Amy Miller's 5th grade class from Wickcliffe Progressive School. Guest presentations on the Biology of Sex to Experience ASC Day (February 2016)

Guest presentation on Carnivorous Plants to Wickcliffe Progressive School (May 2016).

Guest presentation to the Westland Area Library on Bug Eating Plants (June 2014).

Guest presentation to OSU Camp Recky Environmental Camp on Carnivorous Plants (July 2013).

Guest presentation to Science Café at the Worthington Public Library on Carnivorous Plants (July 2013).

Guest presentations to Westdale Heights Academic Magnet School on Carnivorous Plants (Sept 2010; Jan 2011).

Guest presentations on Carnivorous Plants to Zachary, LA, Elementary School (Oct 2010; Jan 2011).

Testimony before the Louisiana Board of Education regarding high school biology textbooks in October of 2010.

Testimony before the Louisiana Senate and House Education Committees regarding SB 733 in the spring of 2008. In addition to this testimony, I conducted print interviews and radio interviews regarding the 'Academic Freedom' bill in Louisiana.