

CURRICULUM VITAE: Christy M. McCain

CU Museum of Natural History and Dept. of Ecology & Evolutionary Biology
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ACADEMIC POSITIONS:

- **Professor:** Dept. of Ecology & Evolutionary Biology (EBIO), Univ. of Colorado (2022–present)
- **Associate Professor:** EBIO, CU (2014–2022); **Assistant Professor:** EBIO, CU (2008–2014)
- **Curator of Vertebrates:** CU Natural History Museum (2008–present)

RESEARCH INTERESTS: the patterns and drivers of biodiversity, determinants of range limits, responses to global change, and the importance of biotic interactions and physiology to those trends with the ultimate goal of informing conservation and building robust ecological theory

EDUCATION:

PhD in Biology, The University of Kansas (2003, honors)
BS in Wildlife Biology, Humboldt State University, CA (1994; summa cum laude)
BA in Studio Art, Humboldt State University, CA (1994; summa cum laude)

PREVIOUS POSITIONS:

- Postdoctoral Fellow: University of New Mexico (2007)
- Postdoctoral Fellow: National Center for Ecological Analysis & Synthesis, University of California, Santa Barbara (2004–2007)
- Natural Resources & Protected Areas Specialist: Peace Corps, Honduras (1994–96)

RESEARCH

PEER-REVIEWED PUBLICATIONS & BOOK CHAPTERS (*graduate student in my lab):

62. Nash, A. L.* and **C. M. McCain**. In press. A drying climate and habitat area drive extirpations of a southward advancing ground squirrel. *Journal of Mammalogy*.

61. Vagle, G.L.* , Lendemer, J., Manzitto-Tripp, E.A., and **McCain, C. M.** In press. Patterns and predictors of lichen rarity in a biodiversity hotspot. *Biodiversity and Conservation*.

60. Beck, J., **McCain, C. M.**, and G. Brehm. In press. Can you trust comparative trait data based on singleton species? *Frontiers of Biogeography*.

59. Garfinkel, C.* and **C. M. McCain**. 2023. Substantial niche overlap in carrion beetle habitat and vegetation use. *Ecological Entomology* 48: 433–444.

58. Mossmann Koch, N., Lendemer, J., Manzitto-Tripp, E.A., **McCain, C.**, and D.E. Stanton. 2023. Carbon-concentrating mechanisms are a key trait in lichen ecology and distribution. *Ecology*: e4011.
57. Manzitto-Tripp, E. A., Lendemer, J. C., and **McCain, C. M.** 2022. Most lichens are rare, and degree of rarity is mediated by lichen traits and biotic partners. *Diversity & Distributions* 28: 1810-1819.
56. **McCain, C. M.** and Garfinkel, C.* 2021. Climate change and elevational range shifts in insects. (Invited paper). *Current Opinion in Insect Science* 47: 111–118.
55. Montaña-Centellas, F. A., Loiselle, B. A., and **McCain, C. M.** 2021. Multiple dimensions of bird beta diversity support that mountains are higher in the tropics. *Journal of Biogeography* 48: 2455-2468.
54. **McCain, C. M.**, King, S. R. B., and T. Szewczyk.* 2021. Unusually large upward shifts in cold-adapted, montane mammals as temperature warms. *Ecology* 102: e03300.
53. **McCain, C. M.** 2021. Another rejection of the more-individuals-hypothesis: Carrion beetles (Silphidae, Coleoptera) in the Southern Rocky Mountains. *Frontiers of Biogeography* 13: e47013.
52. Beck, J. & **McCain, C. M.** 2020. Opinion: Just bird food? – On the value of invertebrate macroecology. *Frontiers of Biogeography* 12: e47684.
51. Vagle, G.L.* and **McCain, C. M.** 2020. Natural population variability may be masking the more-individuals hypothesis. *Ecology* 101: e03035.
50. Montaña-Centellas, F. A., **McCain, C. M.**, and Loiselle, B. A. 2020. Using functional and phylogenetic diversity to infer avian community assembly along elevational gradients. *Global Ecology and Biogeography* 29: 232–245.
49. **McCain, C. M.** 2019. Assessing the risks to United States and Canadian mammals caused by climate change using a trait-mediated model. *Journal of Mammalogy* 100: 1808–1817.
48. Szewczyk, T.* and **McCain, C. M.** 2019. Disentangling elevational richness: a multi-scale hierarchical Bayesian occupancy model of Colorado ant communities. *Ecography* 42: 977–988.
47. Tripp, E. A., Lendemer, J. C., and **McCain, C. M.** 2019. Habitat quality and disturbance drive lichen species richness in a temperate biodiversity hotspot. *Oecologia* 190: 445–457.
46. Bärtschi, F., **McCain, C. M.**, Ballesteros-Mejia, L., Kitching, I. J., Beerli, N. and Beck, J. 2019. Elevational richness patterns of sphingid moths support area effects over climatic drivers in a near-global analysis. *Global Ecology & Biogeography* 28: 917–927.
45. Lendemer, J.C., Keepers, E.A. Tripp, Pogoda, C., **McCain, C.M.**, Kane, N.C. 2019. A taxonomically broad metagenomic survey of 339 species spanning 57 families suggests cystobasidiomycete yeasts are not ubiquitous across all lichens. *American Journal of Botany* 106: 1090–1095.
44. Keepers, K.G., Pogoda, C.S., White, K.H., Anderson Stewart, C.R., Hoffman, J.M., Ruiz, A.M., **McCain, C.M.**, Lendemer, J. C., Kane, N.C., and Tripp, E.A. 2019. Whole genome shotgun sequencing detects

greater lichen fungal diversity than amplicon-based methods in environmental samples. *Frontiers of Ecology & Evolution* 7: 1–14.

43. Tripp, E. A., Morse, C.A, Keepers, K., Anderson Stewart, C., Pogoda, C., White, K. H., Hoffman, J. R., Kane, N.C., and **McCain, C.M.** 2019. Evidence of substrate endemism of lichens on Fox Hills Sandstone: Discovery and description of *Lecanora lendemeri* as new to science. *The Bryologist* 122: 246–259.

42. **McCain, C. M.**, King, S.R.B, Szewczyk, T*, and Beck, J. 2018. Small mammal species richness is directly linked to regional productivity, but decoupled from food resources, abundance, or habitat complexity. *Journal of Biogeography* 45: 2533–2545 & Cover.

41. Beck, J., Takano, H., Ballesteros-Mejia, L., Kitching, I. J., and **McCain, C. M.** 2018. Field sampling is biased against small-ranged species of high conservation value: A case study on the Sphingid moths of East Africa. *Biodiversity and Conservation* 27: 3533–3544.

40. Anderson Stewart, C.R., Lendemer, J.C., Keepers, K., Pogoda, C., **McCain, C.M.**, Kane, N.C. and Tripp, E.A.. 2018. *Lecanora markjohnstonii* (Lecanoraceae, lichenized Ascomycetes), a new sorediate crustose lichen from the southeastern United States. *The Bryologist* 121: 498–512.

39. Beck, J., Rüdinger, C. M. and **McCain, C. M.** 2017. Is the ecological belt zonation of the Swiss Alps relevant for moth diversity and turnover? *Acta Oecologia* 80: 1–7.

38. Beck, J., **McCain, C. M.**, Axmacher, J.C., Ashton, L.A., Bärtschi, F., Brehm, G., Choi, S.-W., Cizek, O., Colwell, R.K., Fiedler, K., Francois, C.L., Highland, S., Holloway, J.D., Intachat, J., Kadlec, T., Kitching, R.L., Maunsell, S.C., Merckx, T., Nakamura, A., Odell, E., Sang, W., Toko, P.S., Zamecnik, J., Zou, Y. and Novotny, V. 2017. Elevational species richness gradients in a hyperdiverse insect taxon: a global meta-study on geometrid moths. *Global Ecology and Biogeography* 26: 412–424.

37. Colwell, R.K., Gotelli, N.J., Ashton, L.A., Beck, J., Brehm, G., Fayle, T.M., Fiedler, K., Forister, M.L., Kessler, M., Kitching, R.L., Klimes, P., Kluge, J., Longino, J. T., Maunselle, S.C., **McCain, C.M.**, Moses, J., Noben, S., Sam, K., Sam, L, Shapiro, A.M., Wang, X. and V. Novotny. 2016. Midpoint attractors and species richness: Modeling the interaction between environmental drivers and geometric constraints. *Ecology Letters* 19: 1009–1022.

36. Szewczyk, T.* and **McCain, C. M.** 2016. A systematic review of global drivers of ant elevational diversity. *PlosONE* 10: e0155404.

35. **McCain, C. M.**, Szewczyk, T.*, Bracy Knight, K.*. 2016. Population variability complicates the accurate detection of climate change responses. *Global Change Biology* 22: 2081–2093.

34. **McCain, C. M.** and J. Beck. 2016. Species turnover in vertebrate communities along elevational gradients is idiosyncratic and unrelated to species richness. *Global Ecology and Biogeography* 25: 299–310.

33. King, S. R. B. and **McCain, C. M.** 2015. *Reithrodontomys megalotis* and *R. montanus* can be robustly discriminated using cranial osteology and external characteristics within age classes. *Proceedings of the Biological Society of Washington* 128: 1–10.

32. **McCain, C. M.** and S. R. B. King. 2014. Body size and activity times mediate mammalian responses to climate change. *Global Change Biology* 20: 1760–1769.
31. Botero, C.A., Dor, R. **McCain, C.M.**, and Safran, R.J. 2014. Environmental harshness is positively correlated with intraspecific divergence in mammals and birds. *Molecular Ecology* 23: 259–268.
30. Graham, C. H., A. C. Carnaval, C. D. Cadena, K. R. Zamudio, T. E. Roberts, J. L. Parra, **C. M. McCain**, R. C. K. Bowie, C. Moritz, S. B. Baines, C. J. Schneider, J. VanDerWal, C. Rahbek, K. H. Kozak, and Sanders, N. J. 2014. The origin and maintenance of montane biodiversity: integrating evolutionary and ecological processes. *Ecography* 37: 711–719.
29. Gaston, K. J., **McCain, C. M.**, and Lyons, S. K. 2014. Abundance and Distributions. Pages 400–402 in *Foundations of Macroecology* (eds. Smith, F. A., Gittleman, J. L. and Brown, J. H.). University of Chicago Press.
28. **McCain, C. M.** 2014. Introduction to *Geographic ranges of North American terrestrial mammals* (Anderson 1977). Page 416 in *Foundations of Macroecology* (eds. Smith, F. A., Gittleman, J. L. and Brown, J. H.). University of Chicago Press.
27. **McCain, C. M.** 2014. Introduction to *The latitudinal spans of seaweed species and their patterns of overlap* (Pielou 1977). Page 465 in *Foundations of Macroecology* (eds. Smith, F. A., Gittleman, J. L. and Brown, J. H.). University of Chicago Press.
26. **McCain, C. M.** 2014. Introduction to *On the relationship between abundance and distribution of species* (Brown 1984). Page 509 in *Foundations of Macroecology* (eds. Smith, F. A., Gittleman, J. L. and Brown, J. H.). University of Chicago Press.
25. **McCain, C. M.** and K. Bracy Knight.* 2013. Is Rapoport's Rule pervasive on mountains? *Global Ecology and Biogeography* 22: 750–759.
24. Hawkins, B.A. **McCain, C.M.**, Davies, T.J., Ackerly, D.D., Anacker, B., Buckley, L.B., Cornell, H.V., Damschen, E.I., Grytnes, J.-V., Harrison, S.P., Kraft, N.J.B., and Stephens, P.R. 2012. Different evolutionary histories underlie congruent species richness gradients of birds and mammals. *Journal of Biogeography* 9:825–841.
23. Cadena, C.D., Kozak, K.H., Gómez, J.P., Parra, J.L. **McCain, C.M.**, Bowie, R.C.K., Carnaval, A.C., Moritz, C., Rahbek, C., Roberts, T., Sanders, N., Schneider, C., VanDerWal, J., Zamudio, K., and Graham, C.H. 2012. Latitude, elevational climatic zonation, and speciation in New World vertebrates. *Proceedings of the Royal Society B-Biological Sciences* 279:194–201.
22. **McCain, C. M.** and R. K. Colwell. 2011. Assessing the threat to montane biodiversity from discordant shifts in temperature and precipitation in a changing climate. *Ecology Letters* 14:1236–1245.
21. Fierer, N., **McCain, C. M.**, Meir, P., Zimmerman, M., Rapp, J. M., Silman, M. R., and Knight, R. 2011. Microbial elevational diversity does not follow the biogeographical trends of plants and animals. *Ecology* 92: 797–804.
20. **McCain, C. M.** 2010. Global analysis of reptile elevational diversity. *Global Ecology and Biogeography* 19:541–553.

19. **McCain, C. M.**, and N. J. Sanders. 2010. Metabolic theory and elevational diversity of vertebrate ectotherms. *Ecology* 91:601–609.
18. **McCain, C. M.** and J. A. Grytnes. 2010. Elevational gradients in species richness. *Encyclopedia of Life Sciences*, John Wiley & Sons, Inc.; 13 pp. [Invited & Peer-reviewed]
17. Buckley, L.B., Davies, T.J., Ackerly, D.D., Kraft, N.J.B., Harrison, S.P., Anacker, B., Cornell, H.V., Damschen, E.I., Grytnes, J.-V., Hawkins, B.A. **McCain, C.M.**, Stephens, P.R. and Wiens, J.J. 2010. Mammalian climate-diversity gradients: An inevitable product of aggregating clades with distinct evolutionary histories? *Proceedings of the Royal Society of London* 277:2131–2138.
16. Smith, F.A., Boyer, A.G., Brown, J.H., Costa, D.P., Dayan, T., Ernest, S.K.M., Evans, A.R., Fortelius, M., Gittleman, J.L., Hamilton, M.J., Harding, L.E., Lintulaakso, K., Lyons, S.K., **McCain, C.M.**, Okie, J.G., Saarinen, J.J., Sibly, R.M., Stephens, P.R., Theodor, J., and Uhen, M.D.. 2010. The evolution of maximum body size in terrestrial mammals. *Science* 330:1216–1219.
15. Wiens, J.J., Ackerly, D.D., Allen, A.P., Anacker, B.L., Buckley, L.B., Cornell, H.V., Damschen, E.I., Davies, T.J., Grytnes, J.-A., Harrison, S.P., Hawkins, B.A., Holt, R.D., **McCain, C.M.** & Stephens, P.R. 2010. Niche conservatism as an emerging principle in ecology and conservation biology. *Ecology Letters* 13:1310–1324.
14. **McCain, C. M.** 2009. Vertebrate range sizes indicate that mountains may be ‘higher’ in the tropics. *Ecology Letters* 12:550–560. (Recommended in *Faculty of 1000*)
13. **McCain, C. M.** 2009. Global analysis of bird elevational diversity. *Global Ecology and Biogeography* 18:346–360.
12. Gotelli, N.J., Anderson, M.J., Arita, H.T., Chao, A., Colwell, R.K. Connolly, S.R. Currie, D.J. Dunn, R.R., Graves, G.R. Green, J.L., Grytnes, J.-A., Jiang, Y.-H., Jetz, W., Lyons, S.K., **McCain, C.M.**, Magurran, A.E., Rahbek, C., Rangel, T.F.L.V.B., Soberón, J., Webb, C.O., and M.R. Willig. 2009. Patterns and causes of species richness: a general simulation model for macroecology. *Ecology Letters* 12: 873–886.
11. **McCain, C. M.** 2007. Area and mammalian elevational diversity. *Ecology* 88:76–86.
10. **McCain, C. M.** 2007. Could temperature and water availability drive elevational diversity? A global case study for bats. *Global Ecology and Biogeography* 16:1–13 & Cover.
9. Dunn, R. R., **C. M. McCain**, and N. J. Sanders. 2007. When does diversity fit null model predictions? Scale and range size mediate the mid-domain effect. *Global Ecology and Biogeography* 16:305–312.
8. Mittelbach, G.G., D. Schemske, H.V. Cornell, A.P. Allen, J. Brown, M. Bush, S.P. Harrison, A. Hurlbert, N. Knowlton, H.A. Lessios, **C. M. McCain**, A.R. McCune, L.A. McDade, M.A. McPeck, T.J. Near, T.D. Price, R.E. Ricklefs, K. Roy, D.F. Sax, D. Schluter, J. M. Sobel, and M. Turelli. 2007. Evolution and the latitudinal diversity gradient: speciation, extinction, and biogeography. *Ecology Letters* 10:315–331.
7. Grytnes, J. A. and **C. M. McCain**. 2007. Elevational trends in biodiversity. Pages 1–8 in *Encyclopedia of Biodiversity* (S. Levin, editor), Elsevier, Inc. [Invited & Peer-reviewed].

6. **McCain, C. M.**, R. M. Timm, and M. Weksler. 2007. *Sigmodontomys aphrastus*: Redescription, taxonomic comparison, and natural history. *Proceedings of the Biological Society of Washington* 120:117–136.
5. **McCain, C. M.** 2006. Do elevational range size, abundance, and body size patterns mirror those documented for geographic ranges? A case study using Costa Rican rodents. *Evolutionary Ecology Research* 8:435–454.
4. **McCain, C. M.** 2005. Elevational gradients in diversity of small mammals. *Ecology* 86:366–372.
3. **McCain, C. M.** 2004. The mid-domain effect applied to elevational gradients: species richness of small mammals in Costa Rica. *Journal of Biogeography* 31:19–31.
2. **McCain, C. M.** 2003. North American desert rodents: a test of the mid-domain effect in species richness. *Journal of Mammalogy* 84:967–980.
1. **McCain, C. M.** 2001. First evidence of giant anteaters (*Myrmecophaga tridactyla*) in Honduras. *Southwestern Naturalist* 46:252–254.

PUBLICATIONS IN REVIEW/REVISION:

- R1. Anderegg, G.* , **McCain, C. M.**, et al. In review. Ethanol concentration of fluid-preserved insect samples is influenced by time and the ratio of specimen to fluid volume.
- R2. Boggess, L. M., **McCain, C. M.**, Pearson, S., Manzitto-Tripp, E. A., and Lendemmer, J. C. In revision. Disturbance and diversity: lichen species richness decreases with increasing anthropogenic disturbance
- R3. Resasco, J., D. P. Vázquez, **C. M. McCain**, and S. D. Olson. In revision. Was Clements wrong? Insights from plant distributions of his life-long study site, Pikes Peak.
- R4. **C. M. McCain**, Tripp, E. A., and Lendemmer, J. C. In revision. Biotic interactions drive lichen elevational diversity.

PUBLICATIONS IN MANUSCRIPT FORM:

- M1. Anderegg, G.* , **McCain, C. M.**, et al. In prep. A survey of the current state of fluid-preserved insects in United States entomology collections.
- M2. Garfinkel, C.* and **C. M. McCain**. In prep. Not smaller at the top: body size clines within and across montane carrion beetles.
- M3. Garfinkel, C.* and **C. M. McCain**. In prep. The role of life stage and season in carrion beetle thermal tolerance.
- M4. Garfinkel, C.* and **C. M. McCain**. In prep. The Climate Variability Hypothesis and local adaptation in carrion beetle thermal tolerance.
- M5. Vagle, G.L.* and **McCain, C. M.** In prep. More rare species at high-diversity sites: the seven forms of rarity in the Colorado mountains.

OTHER PEER-REVIEWED PUBLICATIONS:

Sikes, R. S., Gannon, W. L., and the Animal Care and Use Committee of the American Society of Mammalogists (includes **McCain, C. M.**). 2011. Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *Journal of Mammalogy* 92:235–253.

NON-PEER-REVIEWED PUBLICATIONS: (*graduate student in my lab; **undergraduate student in my lab):

McCain, C.M., Monk, E.**, Hinson, K., Szewczyk, T.*, D’Oench, H.** 2021. Key to the carrion beetles (Silphidae) of Colorado and neighboring states. <http://spot.colorado.edu/~mccainc/PDFs/Key to Silphidae of Colorado.pdf>. [previous version: Monk, E.**, Hinson, K., Szewczyk, T.*, D’Oench, H.**, and **C. M. McCain**. 2016]

GRANTS & FUNDING:*External Sources for Research:*

National Science Foundation: Division of Environmental Biology (1542639), 2015–2021, E. A. Tripp (PI), J. C. Lendemer (PI), N. C. Kane (co-PI), **C. M. McCain** (co-PI), Dimensions of Biodiversity: “Biodiversity gradients in obligate symbiotic organisms: A case study in lichens in a global diversity hotspot” **\$1,794,031**

National Park Service: Rocky Mountain National Park (PI4AC00930), 2014– 2019, **C. M. McCain** (sole-PI) “Improving our understanding of the elevational biodiversity gradient of Rocky Mountain National Park: arthropod diversity and conservation” **\$90,000**

National Science Foundation: Division of Environmental Biology (0949601), 2010–2014, **C. M. McCain** (sole-PI) “Diversity and climate change: using elevational gradients to uncover processes underlying mammalian species distributions” **\$482,843**

National Center for Ecological Analysis and Synthesis (NCEAS; NSF-funded) Working Group Grant, 2008–2010, “*The role of niche conservatism in producing biodiversity gradients*” (H. Cornell, S. Harrison & **C. M. McCain**): **\$56,000**

External Sources for Collections:

Institute of Museum and Library Services (IMLS): 2020– 2023, D. Bowers (PI) and **C. M. McCain** (co-PI) “Enhancing preservation and accessibility of a unique arthropod collection from the mountains of Colorado” **\$249,983 (\$500,048 with cost share)**

Institute of Museum and Library Services (IMLS): 2017– 2019, **C. M. McCain** (PI), E. Braker (co-PI) “Improving herpetology storage conditions at CU Museum of Natural History” **\$95,149 (\$196,468 with cost share)**

CU-Public Crowd Funding Campaign: Mammal Collection Archival Cabinetry Rehousing, 2016, **C. M. McCain** & E. Braker, **\$22,000**

Greenwood Fund: 2015– 2016, **C. M. McCain** (PI), M. D. Bowers (co-PI), V. Scott (co-PI) “Curation of arthropod samples from across elevations in the Colorado Rocky Mountains” **\$1,489**

Internal grant sources: Teaching Collections & Research

2009—CU Junior Faculty Development Award, **C. M. McCain** “Using Mountains to Understand Biodiversity and Climate Change”: **\$5,000**

2010—EBIO Teaching Development Award, **C. M. McCain** & Mariko Kageyama, Bird Teaching Collection Improvement: **\$20,000**

2011—EBIO Teaching Development Award, **C. M. McCain** & Mariko Kageyama, Mammalogy & Mammal Teaching Collection Improvement: **\$10,911**

2015—EBIO Teaching Development Award, **C. M. McCain**, David Stock & Emily Braker, Fish Biology & Fish Teaching Collection Improvement: **\$16,933**

2016 (Spring)—EBIO Teaching Development Award, **C. M. McCain** & Emily Braker, Mammalogy & Mammal Collections Improvement: **\$19,933**

2016 (Fall)—EBIO Teaching Development Award, **C. M. McCain** & Emily Braker, Mammalogy & Mammal Collections Improvement: **\$19,933**

2020—CU LEAP Associate Professor Growth Grant, **C. M. McCain** “Montane beetle biodiversity & the potential effects of climate change”: **\$10,000**

Internal grant sources: Outreach

2008—CU Outreach Award, Dr. C. Regan (PI) & **C. M. McCain** (co-PI) “Girls At the Museum Exploring Science (GAMES): An after-school science program for underserved girls at the University of Colorado Museum of Natural History”: **\$5,000**

2012—CU Outreach Award, Dr. C. Regan (PI) & **C. M. McCain** (co-PI) “Girls At the Museum Exploring Science (GAMES): An after-school science program for underserved girls at the University of Colorado Museum of Natural History”: **\$5,000**

2013—CU Outreach Award, Dr. C. Regan (PI) & **C. M. McCain** (co-PI) “Girls At the Museum Exploring Science (GAMES): An after-school science program for underserved girls at the University of Colorado Museum of Natural History”: **\$8,000**

2014—CU Outreach Award, Dr. C. Regan (PI) & **C. M. McCain** (co-PI) “Girls At the Museum Exploring Science (GAMES): An after-school science program for underserved girls at the University of Colorado Museum of Natural History”: **\$8,000**

2015—CU Outreach Award, Dr. C. Regan (PI), **C. M. McCain** (co-PI), and E. Tripp (Co-PI), “Girls At the Museum Exploring Science (GAMES): An after-school science program for underserved girls at the University of Colorado Museum of Natural History”: **\$8,000**

2016—CU Outreach Award, Dr. C. Regan (PI), **C. M. McCain** (co-PI), and E. Tripp (Co-PI), “Girls At the Museum Exploring Science (GAMES): An after-school science program for underserved girls at the University of Colorado Museum of Natural History”: **\$8,000**

AWARDS/RECOGNITION:

Highlighted Research

Selected as the Keynote Speaker for the Asociación Mexicana de Mastozoología AC in 2021

Research Highlighted (2021) in multiple CU, local, and national news outlets for the upward elevational shifts of Rocky Mountain mammals due to climate change.

Research Highlighted in *The Atlantic*: “Mountains are home to more species than scientists ever imagined: New research contradicts the longstanding belief that diversity drops as elevation gains” by Lorraine Boissoneault, 8 September 2016.

Research Highlighted in *Nature*: News Feature “Climate adaptation: Survival of the flexible” by Hillary Rosner, 05 February 2013. doi:10.1038/494022a

Research Highlighted (2014) in multiple CU, local, and national news outlets for the body size and activity times effects on mammal responses to climate change.

Research Paper selected, reviewed, and recommended by *Faculty of 1000 Biology* (McCain 2009 *Ecology Letters*)

Research highlighted in: *Biogeography, 4th edition*. Sinauer Associates, Inc.

Research highlighted in: *Ecology, Environment and Resource Conservation—an integrated approach*. Anamaya Publishers, New Delhi, India.

Honduran conservation work highlighted in *Women in Natural Resources* (1997) 18:36.

Research Fellowships and Awards

Postdoctoral Fellowship: National Center for Ecological Analysis & Synthesis, UCSB (2004–2007; \$134,000)

Fulbright Fellowship: University of Denmark (2004–5; \$125,000 DKK, awarded but declined)

Jackson Student Paper Award, American Society of Mammalogists (2000)

M.A. & L. Self Graduate Fellowship: academic and leadership fellowship covering tuition, living expenses, and educational expenses, KU (1998–2002; \$82,400 + tuition/fees)

WORKING GROUP COLLABORATIONS:

Synthesis & Visioning Workshop (28-31 May 2019). National Center for Ecological Analysis & Synthesis (**NCEAS**), University of California Santa Barbara, organizer Ben Halpern.

Plant-insect food webs along latitudinal and altitudinal gradients originating from lowland tropical rainforests (Aug. 2013). Czech altitudinal workshop. Organizers: Vojtech Novotny, Yves Basset, Jan Leps, University of South Bohemia, Czech Republic.

Trends in Ecological Analysis and Synthesis (March 2011). Panel Symposium, organizer Frank Davis. **(NCEAS)**

Vast lands and variable data: systematic analyses to understand the patterns and processes of mammal decline (2010–2011). Organizer: Alex Knut. Australian Center for Ecological Analysis and Synthesis, University of Queensland. **(ACEAS)**

The role of niche conservatism in producing biodiversity gradients (2008–2010). Organizers: Howard Cornell, Susan Harrison and **Christy McCain. (NCEAS)**

Montane diversity in space and time (2007–2010). Organizers: Catherine Graham, Kenneth Kozak and Carsten Rahbek. National Evolutionary Synthesis Center **(NESCent)**

Perspectives on the Origin and Conservation of Patagonia (2008). Organizers: Jack W. Sites, Jr. and Daniel G. Faith **(NESCent)**

Integrating macroecological pattern and processes across scales (2007–2009). Organizers: Felisa Smith, Kate Lyons and Morgan Ernest. **(NSF Research Coordination Network)**

Synthetic macroecological models of species diversity (2006–2008). Organizers: Nicholas Gotelli, Robert Colwell and Carsten Rahbek. **(NCEAS)**

Gradients in biodiversity and speciation (2005–2007). Organizers: Gary Mittelbach, Howard Cornell and Douglas Schemske. **(NCEAS)**

WORKSHOPS & PROFESSIONAL DEVELOPMENT:

2021: Crucial Accountability, 3-day CU Faculty Affairs workshop

2009: Introduction to Structural Equation Modeling, ESA Workshop, Dr. James Grace

2006: Multivariate Statistics with PRIMER Workshop, NCEAS, Dr. Marti J. Anderson.

1999: Organization of Tropical Studies, Tropical Ecology Course, San José, Costa Rica

COMPUTER PROGRAMS DEVELOPED AND PUBLISHED ONLINE:

http://spot.colorado.edu/~mccainc/simulation_programs.htm

McCain, C. M. 2003. *Mid-Domain Null*. Spatially-constrained diversity simulation program. Publicly available (used by multiple researchers in 10+ countries) for download with help files & data.

McCain, C. M. 2004. Diversity Simulator. General diversity simulation program.

McCain, C. M. 2005. Sampling Error Simulator. A simulation program to assess various types of sampling error on diversity analyses.

McCain, C. M. 2008, 2012. Rapoport's Rule Tests. A program to assess various methods of testing Rapoport's Rule, including Steven's Method, Midpoint Method, and a quartile MDE analysis.

McCain, C. M. 2014. Beta Diversity Null. A program to assess various calculations of turnover and nestedness, including three null model comparisons. Publicly available for download.

INVITED SEMINARS:

McCain, C.M. 2024 (pending). Host: Jay Storz, University of Nebraska, NE

McCain, C.M. 2023. Host: Luis Ruedas, Portland State University, OR.

McCain, C.M. 2023. Host: Sarah King, Colorado State University, CO.

INVITED SEMINARS (Cont.):

- McCain, C.M. 2023. Host: Will Anderson, Mountain Research Station, CU Boulder
- McCain, C.M. 2021. **Keynote Speaker:** Asociación Mexicana de Mastozoología AC [Mexican Mammalogy Association]. Host: Enrique Martinez Meyer, Society President. "Mammal responses to anthropogenic climate change."
- McCain, C.M. 2021. University of Colorado, Colorado Springs. Host: Jeremy Bono.
- McCain, C. M. 2020 *Covid cancelled*. Organized symposium "A new research frontier: Importance of ecological water availability for animal distribution, abundance, and fitness" at the Ecological Society of America.
- McCain, C. M. 2020 *Covid cancelled*. Kansas State University. Host: Andrew Hope.
- McCain, C. M. 2018. Are Front Range Mammals Moving Upslope? Rocky Mountain National Park.
- McCain, C. M. 2017. University of Michigan. Host: Daniel Rabosky
- McCain, C. M. 2017. University of California, Davis. Hosts: Marcel Holyoak & Jennifer Gremer
- McCain, C. M. 2017. Organized Symposium "Climate Change and Small Mammals: A Global Perspective" (organizers: Peter Meserve, University of Idaho; Christopher Hickman, University of Sydney, Australia): The American Society of Mammalogists, Moscow, ID
- McCain, C. M. 2016. Humboldt State University, CA, USA. Hosts: graduate students
- McCain, C. M. 2015. University of Guelph, Canada. Hosts: Karl Cottiene & Alex Smith
- McCain, C. M. 2014. Organized symposium "Conservation Ecology of Montane Birds" at the Joint meeting of American Ornithologists' Union, Cooper Ornithological Society, and Society of Canadian Ornithologists / Société des Ornithologistes du Canada
- McCain, C. M. 2013. Invited Panelist at International Ecology Congress, London. Organizer: V. Novotny
- McCain, C. M. 2013. South Bohemia University, Czech Republic. Host: Vojtech Novotny
- McCain, C. M. 2013. University of Wyoming. Host: Jake Goheen
- McCain, C. M. 2012. University of Michigan. Host: EEB Graduate students
- McCain, C. M. 2012. International Panelist, National Park Research Conference. Host: Paul McLaughlin
- McCain, C. M. 2012. Rocky Mountain National Park. Host: Jeff Connor & Judy Visty
- McCain, C. M. and S. R. B. King. 2011. Organized Symposium "Small mammal population decline; are patterns of change global or parochial?" (A. Knut, James Cook University, Australia): Joint meeting of Australian and American Mammal Societies, Portland, OR.
- McCain, C. M. 2011. Aarhus University, Denmark. Host: Jens-Christian Svenning
- McCain, C. M. 2011. University of Nevada, Reno. Host: Marjorie Matocq
- McCain, C. M. 2010. Colorado State University, Fort Collins, CO. Host: Amy Angert
- McCain, C. M. 2010. Northern Colorado University, Greeley, CO. Host: Rick Adams
- McCain, C. M. 2009. Fort Lewis College, CO. Host: Koren Nydick
- McCain, C. M. 2009. Stony Brook NY. Host: John J. Wiens
- McCain, C. M. 2007. California State University, San Bernardino. Host: David Polcyn
- McCain, C. M. 2007. University of Colorado. Hosts: Robert Guralnick & Deane Bowers
- McCain, C. M. 2007. Loyola Marymount University, Los Angeles. Host: M. Ramirez
- McCain, C. M. 2006. City College of New York (CUNY, SUNY), Manhattan. Host: Robert P. Anderson.
- McCain, C. M. 2006. University of New Mexico, Albuquerque. Host: Felisa Smith.
- McCain, C. M. 2006. Kenagy Lab, University of Washington, Seattle. Host: Corey Welch.
- McCain, C. M. 2006. University of Alaska Fairbanks. Host: Mark Lindberg.
- McCain, C. M. 2005. University of California, San Diego. Host: Walter Jetz.

INVITED SEMINARS (Cont.):

- McCain, C. M. 2005. Humboldt State University, Arcata, California. Host: Eric Jules.
 McCain, C. M. 2004. Humboldt State University, Arcata, California. Host: Graduate students.
 McCain, C. M. 2000. **Plenary session**, American Society of Mammalogists, Durham, NH.

CONFERENCE PRESENTATIONS (*graduate student in my lab, ** undergraduate student in my lab):

- Resasco, J., D. P. Vázquez, **C. M. McCain**, and S. D. Olson. 2023. Revisiting Clements and Gleason: Insights from plant distributions on Pikes Peak, Clements's life-long study site. Annual Meeting of the Ecological Society of America (ESA).
- Lendemmer, J., Manzitto-Tripp, E., and C.M. McCain. 2023. Internal and external biotic factors drive patterns of lichen species richness in the imperiled Southern Appalachian Biodiversity Hotspot. American Society of Botany.
- Garfinkel, C. F.* & McCain, C. M. 2022. Linking body size clines and thermal tolerance in Colorado carrion beetles. Entomological Society of America (EntoSA), Vancouver, BC.
- Vagle, G. L. *, McCain, C. M., Tripp, E. and J. Lendemmer. 2022. Important conditions for rare lichens vary by elevation in the Southern Appalachians. NA Congress for Conservation Biology, Reno, NV.
- McCain, C. M. 2022. Unusually large upward shifts in cold-adapted, montane mammals as temperature warms. The American Society of Mammalogists (ASM), Tucson, AZ.
- Pittman, C.*, McCain, C. M., and Li, J. 2022. Using CT scanning to identify a potential new *Sorex* species in Colorado. ASM, Tucson, AZ: poster.
- Vagle, G. L. *, and McCain, C. M. 2022. Elevational patterns of the seven forms of rarity in small mammals. ASM, Tucson, AZ.
- Garfinkel, C. F.* & McCain, C. M. 2021. An analysis of the Climate Variability Hypothesis in Colorado carrion beetles. EntoSA, Denver, CO.
- Anderegg, G.* & McCain, C. M. 2021. Jarred potential: A nation-wide survey of fluid-preserved entomology collections and management best practices. Entomology Collections Network Meeting, Denver, CO.
- Vagle, G. L. *, and McCain, C. M. 2020. Natural population variation may be masking the more-individuals hypothesis. ESA, virtual oral.
- Garfinkel, C. F.* & McCain, C. M. 2020. Niche partitioning of habitat and vegetation characteristics by Colorado carrion beetles. Conservation Biology Meeting: virtual meeting poster.
- Garfinkel, C. F.* & McCain, C. M. 2019. Critical thermal limits of Colorado carrion beetles across elevation. Guild of Rocky Mountain Ecologists and Evolutionary Biologists Meeting (GREEBS), Gothic, CO.
- Garfinkel, C. F.* & McCain, C. M. 2019. Niche partitioning of habitat and vegetation characteristics by Colorado carrion beetles. Student Research Spring Symposium, Boulder, CO.
- Vagle, G. L. *, and McCain, C. M. 2019. Natural population variation may be masking the more-individuals hypothesis. ASM, Washington, DC.
- McCain, C. M., King, S.R.B, Szewczyk, T.M. *, and J. Beck. June 2018. Small mammal diversity is directly linked to regional productivity, but decoupled from food resources, abundance, or habitat complexity. ASM, Manhattan, KS.
- Vagle, G. L.* and McCain C. M. 2018. Simulating the more-individuals hypothesis. GREEBS, Boulder, CO.
- McCain, C. M. Nov. 2017. Carrion beetles (Silphidae) along elevational gradients in Colorado: a test of diversity hypotheses. EntoSA, Denver, CO.

CONFERENCE PRESENTATIONS (Cont.)

- McCain, C. M., Szewczyk, T.M. *, Nufio, C., and Hicks, A. Nov. 2017. A comparison of arthropod diversity and abundance along four elevational gradients in Colorado for ants (Formicidae, Hymenoptera), beetles (Coleoptera), and grasshoppers (Caelifera, Orthoptera). EntoSA, Denver, CO.
- Szewczyk, T.M. * and McCain, C. M. Nov. 2017. Ant elevational range sizes increase with seasonal variation across latitudes, but show no consistent patterns across elevations. EntoSA, Denver, CO.
- Szewczyk, T.M. * and McCain, C. M. Nov. 2017. Effects of anthropogenic climatic and land use change on the elevational ranges of Colorado ants. EntoSA, Denver, CO.
- Streb, T.** and McCain, C. M. Nov. 2017. Support for the species-energy theory: Carrion beetle (Silphidae) abundance and diversity are positively related small mammal abundance. EntoSA, Denver, CO.
- McCain, C. M. Sept. 2017. Testing the productivity-diversity relationship for small mammals. GREEBS, Nederland, CO.
- McCain, C. M. Jan. 2017. Productivity directly, and not its indirect influence on food resources, is the primary determinant of mammal elevation diversity. Conference of the International Biogeography Society (IBS), Tucson, AZ.
- McCain, C. M., Szewczyk, T.M.,* and Bracy Knight, K.* June 2016. The importance of population variability to the accurate detection of climate change responses. ASM, University of Minnesota, Minneapolis, MN
- McCain, C. M., Szewczyk, T.M.,* and Bracy Knight, K.* Jan. 2015. The importance of population variability to the accurate detection of climate change responses. IBS, Bayreuth, Germany.
- Szewczyk, T.M.* and McCain, C. M. Jan. 2015. Testing diversity hypotheses: A global analysis of ant diversity across elevations. IBS, Bayreuth, Germany. (Poster)
- Beck, J. and McCain, C. M. Jan. 2015. Individualistic Gleasonian patterns in beta diversity prevail along elevational gradients. IBS, Bayreuth, Germany. (Poster)
- McCain, C. M. June 2014. North American mammals: who is most at risk from anthropogenic climate change? The American Society of Mammalogists (ASM), Oklahoma City, OK.
- Shubin, E.** and McCain, C. M. June 2014. Robust discrimination of *Microtus longicaudus* and *Microtus montanus*. ASM, Oklahoma City, OK.
- Szewczyk, T.M.* and McCain, C. M. Aug. 2013. Testing diversity hypotheses: A global analysis of ant diversity across elevations. ESA, Minneapolis, MN.
- Botero, C.A., Dor, R., McCain, C. M. and Safran, R. J. Aug. 2013. Environmental tolerances, latitudinal gradients, and the potential for speciation in mammals and birds. ESA. Minneapolis, MN.
- Botero, C.A., Dor, R., McCain, C. M. and Safran, R. J. Aug. 2013. Environmental tolerances, latitudinal gradients, and the potential for speciation in mammals and birds. Evolution meeting. Snowbird, UT.
- McCain, C. M. Jan. 2013. Not all mammals are responding similarly to climate change: the importance of body size and activity times. IBS. Miami, FL.
- McCain, C. M. and King, S. R. B. June 2012. Body size, activity times, and geographic location are strongly associated with mammalian responses to anthropogenic climate change. ASM, Reno, NV.
- King, S. R. B. and McCain, C. M. June 2012. Resource partitioning of sympatric shrew species in the Rocky Mountains of Colorado. ASM, Reno, NV.
- McCain, C. M. June 2011. Global climate-change models and mammalian diversity on mountains. Organized Symposium (Robert Anderson, **Christy McCain**): *New ecological and evolutionary perspectives in mammalian biogeography*. Joint meeting of the Australian Mammal Society and the ASM, Portland.
- Bracy Knight, K.* and McCain, C. M. 2011. Elevational Rapoport's rule: montane small mammals challenge its consistency. ASM, Portland, OR.

CONFERENCE PRESENTATIONS (Cont.)

- Gardner, H. T. ** and McCain, C. M. 2011. The relationship between species diversity and environmental productivity: a study of small mammals in the Front Range of Colorado. ASM, Portland, OR.
- Hackemer, J. M. ** and McCain, C. M. 2011. The effect of reproductive status on movement patterns in *Peromyscus* species. ASM, Portland, OR.
- King, S. R. B and McCain, C. M. 2011. Differences in capture of harvest mice (*Reithrodontomys*) using Sherman and pitfall traps. ASM, Portland, OR.
- Parkhill, R. V. ** and McCain, C. M. 2011. The relationship of rodents and burying beetles in the Front Range of Colorado. ASM, Portland, OR.
- McCain, C. M. and Colwell, R. K. 2010. Montane vertebrates in a warming climate: Changes in precipitation amplify extinction risks. ASM. University of Wyoming, Laramie.
- McCain, C. M. and Colwell, R. K. 2010. Montane vertebrates in a warming climate: Changes in precipitation amplify extinction risks. ESA, Pittsburg, PA.
- McCain, C. M. 2009. Climate change on mountains. Annual Meeting of the Guild of Rocky Mountain Ecologists and Evolutionary Biologists (GREEBs). Nederland, CO.
- McCain, C. M. 2009. Janzen revisited: Are mountain passes physiologically higher in the tropics? IBS, Merida, Mexico.
- McCain, C. M. 2008. Janzen revisited: Are mountain passes higher in the tropics? GREEBs. CU Mountain Research Station, Colorado.
- McCain, C. M. 2008. Testing Janzen's hypothesis "Are mountain passes higher in the tropics?" with vertebrates. ASM. South Dakota State University, Brookings.
- McCain, C. M. 2007. Testing Janzen's hypothesis "Are mountain passes higher in the tropics?" with vertebrates. Brown-Smith-Wolf Lab, Dept. of Biology, Univ. of New Mexico.
- McCain, C. M. 2007. Global meta-analysis of elevational diversity of reptiles & amphibians. ESA. San Jose, CA.
- McCain, C. M. 2007. Are bats flying rats or furry birds? A global elevational comparison among birds, bats & rats. ASM. University of New Mexico, Albuquerque.
- McCain, C. M. 2006. Global meta-analysis of elevational diversity of birds. ESA, Memphis, TN.
- McCain, C. M. 2006. Area and spatial constraint cannot drive elevational diversity of mammals. ASM, University of Massachusetts, Amherst.
- Weksler, M., McCain, C. M., and Timm, R.M. 2006. Phylogenetic position of *Sigmodontomys ahrastus* (Cricetidae: Sigmodontinae), an enigmatic rat from transandean forests. ASM, University of Massachusetts, Amherst.
- McCain, C. M. 2005. Elevational gradients in bat diversity: Is declining diversity the norm? ESA, Montreal, Canada.
- McCain, C. M. 2005. Elevational gradients in bat diversity: Is declining diversity the norm? ASM, Southwest Missouri State, Missouri.
- McCain, C. M. 2004. Elevational gradients in small mammal diversity: mid-elevational peaks and effects of climate, latitude, and area. ESA, Portland, Oregon.
- McCain, C. M. 2004. Elevational range size-abundance patterns of Costa Rican rodents. ASM, Arcata, CA.
- McCain, C. M. 2004. Ecological gradients in diversity of small mammals: patterns and models. National Center for Ecological Analysis and Synthesis, UCSB.

CONFERENCE PRESENTATIONS (Cont.)

- McCain, C. M. 2003. Ecological gradients in diversity and abundance: a search for patterns and processes in small mammal communities. Dissertation defense: EEB Dept. Seminar Series. The University of Kansas, Lawrence, Kansas.
- McCain, C. M. 2003. Species richness patterns of small mammals along an elevational gradient in Costa Rica. ESA, Savannah, Georgia.
- McCain, C. M. 2003. A review of elevational gradients in species richness of small mammals: ubiquitous mid-elevational peaks. ASM, Lubbock, Texas.
- McCain, C. M. 2002. Elevational species richness transects: Do replicates matter? ASM, Lake Charles, Louisiana.
- McCain, C. M. 2001. Do elevational diversity patterns of small mammals show the mid-domain effect? ASM, Missoula, Montana.
- McCain, C. M. 2001. Elevational patterns of small mammals in Costa Rica. Natural History Museum and Biodiversity Research Center, The University of Kansas, KS.

TEACHING AND MENTORING**Courses Taught, University of Colorado:**

Instructor: **Mammalogy**, Ecology & Evolutionary Biology (EBIO 4760/5760), CU

Boulder. 3 hours lecture and 2-3 labs (3 hours; TA; 3rd lab started in 2020); Grad. Seminar (depending on the number of graduate students)

- Fall 2009, 2011, 2012, 2014, 2016, 2018, 2020, 2021, 2023
- New Lab Manual Developed (2009): 115 pp.; significant Lab Manual Revision (2020, 2021); Remote labs, electronic media study guides, and electronic media study quizzes developed (2020)
- Faculty Course Questionnaire Scores, **FCQs (out of 6: thru 2019; out of 5 2020+)**:
 - Course Ratings: **5.3** (2009), **5.7** (2011), **5.8** (2012), **5.7** (2014, 2016), **5.4** (2018), 2020: Connect w/ real world issues = **4.6/5**; Evaluate arguments, evidence, results= **4.4/5**; Challenge to develop knowledge/understanding = **4.5/5** (all above CU 2020 average); 2021: Reflect on what I was learning = **4.5/5**; Connect w/ real world issues = **4.3/5**; Evaluate arguments, evidence, results= **4.3/5**;
 - Instructor Ratings: **5.5** (2009), **5.8** (2011), **5.9** (2012), **5.7** (2014), **5.9** (2016), **5.7** (2018), no composite scores 2020+

Instructor: **Creative Conservation Messaging**, Ecology & Evolutionary Biology Graduate Seminar (EBIO 6100)/Museum and Field Studies (MUSM 6110), 3-hour practical seminar

- Spring 2014 (11 students), Spring 2017 (9 students)
- Developed as New Class (2014, revised 2016)
- FCQ Course Ratings (out of 6): **5.5 5.4**; Instructor Ratings: **5.8, 5.8**

Instructor: **Mountain Ecology & Conservation**, Ecology & Evolutionary Biology (EBIO 3170), CU Boulder. 3 hours lecture.

- Spring 2014 (48 students; developed as New Class)
- FCQ Course Ratings (our of 6): **5.5**; Instructor Ratings: **5.**

Instructor: **Field Methods in Zoology and Botany**, Museum and Field Studies (MUSM 4795/5795), cross-listed in Ecology & Evolutionary Biology (EBIO 4795/5795) and Environmental Studies (ENVS 4795), CU Boulder.

- Fall 2008, 2010
- FCQ Course Ratings (out of 6): **5.5** (2008), **5.5** (2010); Instructor Ratings: **5.8** (2008), **5.6** (2010)

Instructor: **Biogeography: Foundations & Frontiers**, Ecology & Evolutionary Biology, Graduate Seminar (EBIO 6100), Spring 2011, 3 hour seminar/week—paper discussions

- FCQ Course Rating (out of 6): **5.1**; FCQ Instructor Rating: **5.7**

Instructor of **Independent Study**:

- Richard Parkhill, EBIO Undergraduate, Fall 2010
- Emma Shubin, EBIO Undergraduate, Fall 2011
- Tim Szewczyk, EBIO Graduate, Fall 2012
- Katie McComas, MFS Graduate, Spring 2014
- Emily Lannoye, MFS Graduate, Fall 2014
- Holly D'Oench, EBIO Undergraduate, Fall 2014
- Abigail Gibson, EBIO/UROP, Summer 2015 (w/ Cesar Nufio)
- Emily Monk, EBIO/UROP, Summer 2015 (w/ Cesar Nufio)
- Tyler Streb, EBIO/UROP, 2016-2017
- Kathryn Larson, EBIO Undergraduate, Spring 2017
- Genevieve Anderegg, MFS Graduate, Fall 2021

Guest Lecturer CU:

- **EBIO 1020**, Introduction of Ecology & Evolutionary Biology (Fall: 2021)
- **EBIO 3040**, Conservation Biology (Fall: 2009–2015, 2017)
- **EBIO 6000**, Graduate Research Seminar (Fall: 2008–2017)
- **MUSM 5051**, Collections Management (2008, 2010–2016)
- **MUSM 5011**, Introduction to Museum Studies (Fall: 2010–2014)
- **EBIO 5820**, Graduate Writing Seminar (Spring: 2012 x 2)
- **EBIO 4460**, Film & Climate Change (Guest Judge: Fall 2011–2013)

Guest Lecturer External:

- Diversity Gradients, **Biogeography**, Biology Dept., City College of New York (CUNY, SUNY). November 2006
- ANOVA, **Biostatistics**, University of Kansas (KU). Spring & Fall 2003

External Workshops (Organizer/Presenter):

- **Mountain Biodiversity & Conservation Part I**, 9-11 Feb. 2016, 50+ participants from the Rocky Mountain National Park interpretive and resource management staff.
- **Mountain Biodiversity & Conservation Part II**, 16 March 2018, participants from the Rocky Mountain National Park interpretive and resource management staff.

Workshops Attended:**EXTERNAL TEACHING WORKSHOPS (participant):**

Animal Diversity Web-Quaardvark: invited faculty participant in developing active learning modules involving structured search tool and inquiry support environment for natural history data (University of Michigan 2011; multiple webinars (2011-2013)), used in Mammalogy (2012, 2014, 2020).

CU WORKSHOPS (participant):

Fall 2023: Inclusive Research Mentoring for Faculty (Session 1: Aligning Expectations; Session 2: Maintaining Effective Communication)

Fall 2008: Well Argued? Well Written! Workshop, CU Faculty Teaching Excellence Program (**FTEP**), Dr. Elissa Guralnick

Spring 2008: Introductory Leadership Workshop, **LEAP** program

MENTORING:**Awards**

Marinus Smith Award 2021, nominated by Austin Nash (CU award for students to recognize CU Boulder faculty, staff, coaches & administrators who made a significant impact in their lives)

UROP Mentoring Award Nomination 2020

Postdoctoral, Research, Sabbatical Associates

Andrew Hicks, CU Museum May 2016–2017, 2020–present (entomological researcher)

Kevin Hinson, CU Museum 2015 (postdoc)

Sarah R. B. King, EBIO & CU Museum 2010–2013 (postdoc)

Julio Lemos-Espinal, UNAM, 2023-2024 (sabbatical associate)

Current Graduate Student Committees**Chair of Committee:**

Patricia Marquez, MS *Museum & Field Studies* (MFS) 2023–present

Committee Member:

Nichole Addison, PhD *Ecology & Evolutionary Biology* (EBIO) 2023–present

Laura Boggess, PhD Biology City University of New York, 2021–present

Alyson Ennis, PhD EBIO 2020–present

Sara Garcia, PhD EBIO 2021–present

Thiago Kossmann Cardoso, PhD EBIO 2022–present

Anna Paraskevopoulos, PhD EBIO 2020–present

Stephanie Tkacik, MS *Geological Sciences* (GEOL) 2023–present

Past Graduate Student Committees**Chair of Committee:**

Genevieve Anderegg, MS *Museum & Field Studies* (MFS) 2020–2022

Anna Chinn, MS MFS 2016–2018

Chloe Garfinkel, PhD *Ecology & Evolutionary Biology* (EBIO) 2018–2023

Garrett Jolma, MS MFS: 2021–2023 (co-advised w/ Dr. Bowers)

Kevin B. Knight, PhD EBIO 2011–2017
Jessica Mailhot, MS MFS 2018–2020
Tara Menne, MFS Certificate 2010–2014
Austin Nash, MA EBIO 2018–2022
Cameron Pittman, MS MFS: 2021–2023 (co-advised w/ Dr. Li)
Tim Szewczyk, PhD EBIO 2011–2017
Grant Vagle, PhD IQBio & EBIO 2017–2023

Committee Member:

Madelaine Atteberry, MA GEOL 2016–2019
Christina Avena, PhD EBIO 2015–2019
Erin Barbeau, MS MFS 2018–2019
Kelly Carscadden, PhD EBIO 2017–2021
Evelyn Cheng, MS EBIO 2012–2014
Jack Darcy, PhD EBIO 2011– 2017
Julia Dupin, PhD EBIO 2013– 2017
Richard Dyer, BA-MA MATH 2018
Peter Erb, MA EBIO 2008– 2009
Erik Funk, PhD EBIO 2018–2022
Trevor Ganske, MS MFS 2018–2019
Carrie Graeff, MA EBIO 2009– 2011
Heather Hamilton-Robson, MS MFS 2008– 2011
Hilary Hastings, MA/BA EBIO 2012–2014
Katie Kavulic, MS EBIO 2012–2014
Nicole Krou, MS Art & Art History 2014–2016
Ryan Langendorf, PhD ENVS 2014– 2015
Emily Lannoye, MS MFS 2014– 2015
Skylar Lynch, MA EBIO 2021–2022
Melinda Markin, PhD EBIO 2013–2014
Jeff McClenahan, MS MFS 2008–2009
Katie McComas, MS MFS 2013– 2014
Joe Mihaljevic, PhD EBIO 2010–2014
Liesl Peterson-Erb, PhD EBIO 2008– 2013
Melissa Reed-Eckert, MS MFS 2008–2009
Angela Romano, MA MFS 2021–2022
Wendy Schultz, MS MFS 2008–2009
Joshua Seabaugh, MA EBIO, 2022-2023
Hannah Selvey, MA Anthropology 2016–2018
Mathew Sharples, PhD EBIO 2013– 2014
Lauren Shoemaker, PhD EBIO 2013– 2017
Sierra Stowell, MA EBIO 2009-2011
Tara Templeton, MS MFS 2016–2018
Evan Thomas, PhD EBIO 2011– 2016
Julie Thomas, PhD Anthropology 2019–2023

Past Committee Member (cont.):

Deborah Wagner, MS MFS 2011–2013

Jennifer Wilkening, PhD EBIO 2009–2014

Amanda Williams, MA EBIO 2009–2011; PhD EBIO 2012–2014

Megan Zabinski, PhD EBIO 2018–2023

Undergraduate Honors & Research Student Committees**Chair of Committee:**

Holly D'Oench, EBIO, 2012–2015 (BURST mentee)

Richard Dyer, EBIO independent research, 2017–2018

Hayden Gardner, EBIO, 2010–2011, magna cum laude

Abigail Gibson, Summer 2015 (UROP)

John Hackemer, EBIO, 2010–2011, magna cum laude

Anthony Kunkel w/ Chloe Garfinkel, EBIO, 2021–2022 (UROP)

Emily Monk, EBIO, Summer 2015 (UROP)

Austin Nash, EBIO, 2018–2020 (UROP, Honors)

Benjamin Shipley, EBIO Honors, 2017–2018, magna cum laude

Emma Shubin, EBIO, 2011–2013, magna cum laude

Tyler Streb, EBIO Honors & UROP, 2017–2018

Daniella Ramos, EBIO, 2012–2013, cum laude

Committee Member:

Shay Ding, EBIO, 2020–2021

Geoffrey Flora, GEOL, 2021

Kasdi Sujono, GEOL, 2018–2019

Will Wilson, EBIO, 2017–2018

Justine Smith, EBIO, 2009–2010

Natalie Alberg, EBIO, 2008–2009

SERVICE**NATIONAL & INTERNATIONAL SERVICE:**

Associate Editor at *Global Ecology and Biogeography* **2010–2014**; associate editor requests (declined): *Journal of Biogeography*, *Journal of Mammalogy*, *Ecography*, *Proceeding of the Royal Society: Biological Sciences*

International External PhD Reviewer for PhD student at Aarhus University, Department of Biological Science, Spring 2011

Invited Review Board Member: Zoological Research Museum Alexander Koenig, Bonn. February 2013

Referee of Manuscripts for:

Annals of Botany, *American Naturalist*, *Biology Letters*, *Diversity and Distributions*, *Ecography*, *Ecological Monographs*, *Ecology*, *Ecology and Evolution*, *Ecology Letters*, *Global Change Biology*, *Global*

Ecology and Biogeography, Journal of Biogeography, Journal of Ecology, Journal of Mammalogy, Journal of Tropical Ecology, Oecologia, Oikos, Nature, New Phytologist, PLOS ONE, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society: Biological Sciences, Science, and more...stopped keeping track.

Referee of Proposals for:

National Science Foundation:

External reviewer: many

DEB/BIO Panelist. Spring 2010, Spring 2012, Fall 2012, Spring 2017, Spring 2023 x 2

Declined multiple panel requests due to other time commitments (2018-2021)

Graduate Women in Science: 2017

Society Memberships & Service:

- ***American Society of Mammalogists***

Local Committee, CU, 2018-present

Program Committee, 2018-present

Board of Directors (elected position), 2011–2014

Animal Use and Care Committee, 2011–2015

Education and Graduate Students Committee 2004–2011; Chair 2007–2010

Local Committee, UNM, 2007

- ***American Association for the Advancement of Science***

- ***British Ecological Society***

- ***Ecological Society of America***

- ***International Biogeography Society***

Member of the MacArthur-Wilson Award committee (2014–2015)

- ***Society for Conservation Biology***

UNIVERSITY OF COLORADO SERVICE:

University Service

Natural Sciences Council Representative, 2023–present

Natural Sciences Council Budget Committee, 2023–present

Voting member of the Tenure & Promotion for an assistant professor in the Department of Critical Media Practices 2020 [per their bylaws tenured professor was needed]

Department of Ecology & Evolutionary Biology (EBIO)

Chair of Full Professor PUEC Committee for Andrew McAdam, 2023

Early Career Mentoring Committee, 2023-present

Faculty Mentor for Dr. Julian Resasco, 2021–present

Annual Merit Review Committee, 2011–2012, 2014–2015, 2017–2018, 2022-2023

EBIO Faculty Affairs Committee, chair 2021-2022

Ad Hoc Conflict-Resolution Committee, chair 2021-2022

Executive Committee, 2009–2010; 2018-2019; 2021-2022

Faculty Mentor for Dr. Jingchun Li, 2016–2022 (w/ Museum)

Budget Committee, member 2020–2021
 Instructional Funding Committee, member 2016–2017; chair 2017–2021
 Delegate to the Organization of Tropical Studies, 2012–2021
 Reappointment PUEC Committee for Dr. Jingchun Li, 2020
 Tenure & Promotion PUEC Committee for Dr. Erin Tripp, 2018–2019
 Faculty Mentor for Dr. Erin Tripp, 2016–2019 (w/ Museum)
 Tenure & Promotion PUEC Committee for Dr. Valerie McKenzie, 2016
 Reappointment PUEC Committee for Dr. Erin Tripp, 2015
 Graduate Committee, 2011–2013
 Ad-hoc Committee on EBIO ESVC Visioning Committee, 2012–2013
 Reappointment PUEC Committee for a MASP lecturer, 2010
 Ad-hoc Committee on EBIO Voting Procedures, 2008

Museum of Natural History

Entomology Curator Search Committee Chair, 2023-present
 Collections Committee, Co-Chair, 2008–present
 Annual Merit Review Committee, 2010–2011, 2014–2015, 2016–2017, 2019, 2022–2023
 ARPAC Co-Chair for Administration; Committee for Resources, 2021–2022
 Anthropology Curator Search Committee 2017–2018
 Invertebrate Collection Manager Search Com., 2012–2013, 2017–2018
 Invertebrate Curator Search Committee Chair 2014–2015
 Vertebrate Collection Manager Search Chair, 2013–2014
 ARPAC Committees (Research; Resources), 2013–2014
 Vertebrate Collection Manager Search, Chair 2010
 Strategic Planning Committee, 2008–2010

COMMUNITY OUTREACH:

- 2023:** Oral History Interview with historian of the **National Park Service and Rocky Mountain National Park**, Dr. Ruth Alexander (pending Sept. 2023)
- 2022:** Public (Zoom) Talk for **Boulder Audubon**: “Impacts of climate change on small mammals in the Colorado Rockies”
- 2021:** Participated in **Art Exhibit NESTed Roots** in Collaboration with NEST Studio for the Arts [Nature, Environment, Science, and Technology] in collaboration with Carbondale Arts and CORE [Community Office for Resource Efficiency]. Two contributed pieces highlighting climate change impacts: “Fire” and “Heat.”
- 2021:** Public (Zoom) Talk through the **CU Museum**: “How climate change is affecting Colorado’s Rocky Mountain Mammals”
- 2019:** Public Talk for the **Earth Day Forum** “The Science of Climate Disruption” held at the Longmont Public Library: “Animals & plants are responding to climate change”
- 2018:** Participated in the **Science Discovery** Mountain Research camp for under-represented high school students. Research Day Aug. 2): Day in the life of a carrion beetle researcher.
- 2008–present:** Participant & P.I. for **GAMES**: Girls at the Museum Exploring Science. An after-school science program at the CU Museum encouraging interest and excitement about science in preadolescent girls—primarily preadolescent girls from low-income, minority backgrounds—by

direct interaction with female scientists.

- 2017–2018:** Organized and Participated in a **Climate Change Symposium** of multiple nationally and internationally-recognized climate change scientists from modelers at NCAR to plant biologists at CU for Rocky Mountain National Park Staff [Part II: 16 March 2018]
- 2015–2016:** Developed & taught 3-Day Workshop “Mountain Biodiversity & Conservation” for **Rocky Mountain National Park** Staff [Part I: 9-11 Feb. 2016]
- 2014:** Invited participant in **Biodiversity Summit**, Rocky Mountain National Park
- 2013:** Invited seminar at **Miramontes Arts & Sciences Program** (MASP), University of Colorado. March 2013. Mountains, mammals, and climate change.
- 2012:** Outreach Talks with the National Park Service staff, volunteers, and researchers Scientist Table [Mammals & Climate Change] at the **BioBlitz 2012** with Rocky Mountain National Park and National Geographic Society
- 2012: Public Lecture:** McCain, C. M. August 2012. Mountain Biodiversity: Where are most species of vertebrates and why? RMNP “Behind the Scenes”
- 2011:** Mountain Diversity & Climate Change talks (3): Seniors in Biology at **Fairview High School**, Boulder, CO (host: Dr. Paul Strode)
- 2006:** Minority Outreach in the **NCEAS program** to increase participation by minorities in ecology. Biology Dept., City College of New York, Manhattan (a minority serving institution).
- 2004:** Participation in NCEAS program **Kids Do Ecology**

CURATION

MUSEUM-COLLECTION ADMINISTRATION

Vertebrate Collections: *data publicly available on ARCTOS, VertNet, & GBIF*
>122,000 specimens, including Amphibians & Reptiles, Birds, Fishes, and Mammals

SUPERVISEES:

Current:

Emily Braker, Vertebrate Collections Manager, full-time, 2014–present

Patricia Marquez, Graduate Vertebrate Collections Assistant, part-time, 2023–present

Various Collections Undergrad Assistants & Volunteer Assistants

Past: previous Collection Manager, 22+ Graduate Assistants, innumerable volunteers

VERTEBRATE COLLECTION’S LARGE PROJECTS:

- **oMeso Imaging Project:** CT scanning of 1100 species of rare Mesoamerican amphibians & reptiles for which collection manager Emily Braker received an NSF grant (\$173,380; 2020-2023) in partnership with University of California Berkeley and University of Florida.
- **Herpetological Collections upgrade:** compactors & shelving units; archival jars, ethanol replacement & remediation (2014–present; 2017-2019 IMLS grant \$95,146)
- **Egg and Nest Digitization & Rehousing** (2011–2018); **New Cabinetry** (2020)

- **Mesa Verde National Park Biosurvey:** survey of mammals, other vertebrates, and carrion beetles in the park (Summer 2018; funding ~19K)
- **Mammal Research Collections upgrade:** new archival cabinetry & drawers (2015–2017: Greenwood fund \$1459; EBIO grants \$40K; Crowdfunding campaign \$22K)
- **Fish Teaching Collection Upgrade:** tanks, tank racks, archival jars, ethanol replacement (\$16,933 EBIO grant; 2015)
- **Bird Teaching Collection Improvement:** new archival cabinetry & drawers; rehousing of new and old teaching specimens and mounts (2012; EBIO grant \$20,000)
- **Mammal Teaching Collection Improvement:** new archival cabinetry & drawers; rehousing of new and old teaching specimens and mounts (2011; EBIO grant \$10,911)

SUMMARY OF OTHER COLLECTIONS PROJECTS:

- **McCain Collection Donations:** ~1600 (mammals, herps, birds); >600,000 arthropods to Entomology & Invertebrates
- **Specimen Loans:** 555 loans of ~14,500 specimens
- **CU Classes Supported with Teaching Collection:** Fish Biology, Mammalogy, Ornithology, Winter Ecology, Field Mammalogy, Vertebrate Paleontology, Introductory Archeology, Museum Practica, Zooarcheology
- **Visitors & Researcher to the Vertebrate Collections:** average ~200/year with a nearly equal split among researchers, undergraduate and graduate students, and K-12 visitors.
- **Funding** (see **Grants: External Sources for Collections**, page 7): With those grants and those listed above (see **oMeso Project** page 20), we have garnered \$629,711 in collections funding across the vertebrates and entomology collections.
- **Facilities Upgrades:** all vertebrate collections, including research, teaching, and public education are now rehoused in state-of-the-art cabinetry with archival materials, archival jars & lids, and with best practices established for long-term ethanol care, pest management, electronic versions of ledgers and field notes, and online, public specimen databases, imaging and loan tracking.