

CAITLIN J. CAMPBELL

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EDUCATION

- PhD** University of Florida 2018 – present
Doctoral student of Zoology, Department of Biology. GPA 4.0.
Advisor: Hannah Vander Zanden
- MS** University of Maryland Center for Environmental Science 2018
Appalachian Laboratory;
Frostburg State University
Applied Ecology and Quantitative Biology. GPA 4.0.
Advisor: David M. Nelson
- BS** University of Vermont 2012
Environmental Science: Conservation Biology and Biodiversity.
Honors Graduate

PUBLICATIONS

Published / In Press

- Campbell, C. J.**; Fitzpatrick, M.C.; Vander Zanden, H.; Nelson, D. M. 2020. Advancing interpretation of stable isotope assignment maps: comparing and summarizing origins of known-provenance migratory bats. *Animal Migration*. doi: <https://doi.org/10.1515/ami-2020-0004>
- Katzner, T. E.; Nelson, D. M.; Diffendorfer, J. E.; Duerr, A. E.; **Campbell, C. J.**; Leslie, D.; Vander Zanden, H. B., Yee, J. L., Sur, M., Huso, M.M.P., Braham, M.A., Morrison, M.L., Loss, S.R., Poessel, S.A., Conkling, T.J., Miller, T. A.. 2019. Wind energy: An ecological challenge. *Science* 366(6470):1206–1207. doi: 10.1126/science.aaz9989
- Nelson, D.M.; Nagel, J.; Trott, R.; **Campbell, C. J.**; Pruitt, L.; Good, R.E.; Iskali, G. and Gugger, P.F. 2018. Carcass age and searcher identity affect morphological assessment of sex of bats. *The Journal of Wildlife Management*. 82(8), 1582-1587.
- Campbell, C. J.**; Nelson, D. M.; Ogawa, N.O.; Chikaraishi, Y.; and Ohkouchi, N. 2017. Trophic position and dietary breadth of bats revealed by nitrogen isotopic composition of amino acids. *Scientific Reports* 7:15932.
- Roman, J.; Altman, I.; Dunphy-Daly, M.; **Campbell, C.**; Jasny, M.; and Read, A. 2013. The Marine Mammal Protection Act at 40: Status, recovery, and future of U.S. marine mammals. *The Annals of the New York Academy of Sciences* 1286:29-49.

Theses

Campbell, C. J. 2018. Refining assessment of geographic origins of animals inferred from stable isotope data. **Masters Thesis**, Department of Biology, Frostburg State University, Frostburg, MD.

Campbell, C. 2012. Livestock depredation by large carnivores: An analysis of human-wildlife conflict in Ehi-rovipuka, Namibia. **Honors thesis**: Environmental Sciences, Biology. University of Vermont, Burlington, VT.

In preparation

Campbell, C. J.; Nelson, D. M.. *In prep.* Hydrogen isotope markers reveal complex seasonal migratory structure in at-risk North American bats. ***Frontiers in Ecology and the Environment***.

Smith, L. M.; Doonan, T. J.; Gore, J. A.; **Campbell, C. J.** *In prep.* Are some bats snowbirds?: Stable hydrogen isotopes to determine probable origins of wintering tricolored bats in Florida caves.

HONORS AND AWARDS

2019	University of Florida Biodiversity Institute Summer Fellowship (\$4,000)
2019	Dr. Michael May Graduate Student Fellowship in Biology (\$4,000)
2018 – 2023	Graduate Student Funding Award Fellowship, Department of Biology, University of Florida (\$120,000)
2017	Student Presentation Award, North American Society for Bat Research Annual Symposium
2016	NSF East Asia and Pacific Summer Institute Research Fellowship (\$5,400)
2016	Japanese Society for the Promotion of Science Research Fellow (\$5,200)
2016	Best Student Poster, North American Society for Bat Research Annual Symposium
2012	Honors Graduate of the College of Arts and Sciences
2011	Benjamin A. Gilman International Scholarship (\$5,000)
2010	Round River Conservation Studies Ed Abby Scholarship (\$1000)
2008 – 2012	Presidential Scholarship, University of Vermont (\$10,500)
2008	National Merit Scholar Commendation

OPEN SOURCE SOFTWARE

Author

isocat: Isotope Origin Clustering and Assignment Tools. 2018.
Release: <https://CRAN.R-project.org/package=isocat>
Development: <https://github.com/cjcampbell/isocat>

Contributor

phenesse: Estimate Phenological Metrics using Presence-Only Data. 2019.

Release: <https://CRAN.R-project.org/package=phenesse>

Development: <https://github.com/mbelitz/phenesse>

PRESENTATIONS

A framework for predicting migratory behavior and wind-development impacts: Uniting morphological and life-history characteristics with distribution-based migration models. Caitlin J. Campbell and Hannah Vander Zanden. Oral Presentation. December, 2020. 13th Wind Wildlife Research Meeting, online.

A review of cave and mine use by tree-roosting bats. Caitlin J. Campbell and Hannah Vander Zanden. Poster presentation. February, 2020. 25th Annual Meeting of the Southeastern Bat Diversity Network and 30th Annual Colloquium on the Conservation of Mammals in the Southeastern U.S., Athens, GA.

Are some bats snowbirds?: Stable hydrogen isotopes to determine probable origins of wintering tri-colored bats in Florida caves. Lisa M. Smith, Terry J. Doonan, J. A. Gore, Caitlin J. Campbell. February, 2020. 25th Annual Meeting of the Southeastern Bat Diversity Network and 30th Annual Colloquium on the Conservation of Mammals in the Southeastern U.S., Athens, GA.

Hydrogen isotopes reveal complex seasonal migratory structure in at-risk tree-roosting bats in North America. Caitlin J. Campbell, David M. Nelson. Oral presentation. October, 2019. North American Society for Bat Research, Kalamazoo, MI.

Hydrogen isotopes reveal complex seasonal migratory structure in at-risk tree-roosting bats in North America. Caitlin J. Campbell, David M. Nelson. Oral presentation. July 31, 2019. International Bat Research Conference, Phuket, Thailand.

Hydrogen isotopes reveal complex seasonal migratory structure in at-risk tree-roosting bats in North America. Caitlin J. Campbell, David M. Nelson. Oral presentation. July 24, 2019. International Congress for Conservation Biology, Kuala Lumpur, Malaysia.

From knowledge gaps to origin maps: Projecting animal movement with stable isotopes and beyond. Caitlin J. Campbell. Oral Presentation. March 1, 2019. Perspectives in Ecology and Evolution Research Seminar Series, Department of Biology, University of Florida, Gainesville, FL.

Refining assessment of geographic origins of animals inferred from stable isotope data. Caitlin J. Campbell. Thesis defense presentation. August 1, 2018. Department of Biology, Frostburg State University, Frostburg MD.

Range-Wide Migratory Patterns of North American Tree-Roosting Bats. Caitlin J. Campbell, Matthew Fitzpatrick, and David M. Nelson. Oral presentation. October 19, 2017. North American Society for Bat Research Annual Symposium, Knoxville, TN.

Range-wide migratory movements of North American tree bats inferred from stable isotopes. Caitlin J. Campbell, Matthew Fitzpatrick, and David M. Nelson. Poster presentation. August 11, 2017. Ecological Society of America Annual Meeting, Portland, OR.

Amino acid nitrogen isotopes reveal the trophic position and dietary strategies of bats. Caitlin J. Campbell, David M. Nelson, Nanako Ogawa, Yoshito Chikaraishi, and Naohiko Okhouchi. October 13, 2016. Poster presentation. North American Society for Bat Research Annual Symposium, San Antonio, TX.

- Bats! A Brief Introduction to Microchiroptera*. Oral presentation, July 6, 2016. Department of Biogeochemistry, Japanese Agency of Marine Science and Technology, Yokosuka, Kanagawa, Japan.
- Range-wide Models of the Migratory Movements of North American Tree Bats*. Oral presentation, May 12. Graduate Research Symposium, Frostburg State University, Frostburg MD.
- Hydrogen Isotope Ecology: Analysis and Application to the Study of Bat Movement*. Jake Blakely, Kamren Jefferson, Crystal Tippet, Caitlin J. Campbell, and David Nelson. Poster presentation by undergraduate volunteers, May 6, 2016. Undergraduate Research Symposium, Frostburg State University, Frostburg, MD.
- Range-wide Models of the Migratory Movements of North American Tree Bats*. Oral presentation, April 20, 2016. Department of Biology Seminar Series, Frostburg State University, Frostburg, MD
- A Continent-wide Approach to Link Movement Ecology and Genetic Structure of Migratory Foliage-roosting Bats*. Caitlin J. Campbell, Paul F. Gugger, and David M. Nelson. Poster presentation, January 11, 2016. New England Bat Working Group Meeting, Baltimore, MD.
- Livestock depredation by large carnivores: An analysis of human-wildlife conflict in Ehirovipuka, Namibia*. Oral presentation, April 19, 2012. University of Vermont Student Research Conference, Burlington, VT.
- The odd couple: Indigenous group and international NGO cooperation creates a two-pronged approach to halt development of the Narmada River in India*. Poster presentation, April 22, 2009. University of Vermont Student Research Conference, Burlington, VT.

RESEARCH EXPERIENCE

Graduate Research Assistant, July 2015 – August 2018

University of Maryland Center for Environmental Science
Appalachian Laboratory, Frostburg, MD

- Modeled seasonal movements of long-distance migrant bats *Lasiurus cinereus*, *L. borealis*, *Lasionycteris noctivagans* using Bayesian probabilistic assignment of summer origins inferred from stable hydrogen isotope analysis and ensemble species distribution models
- Developed novel statistical techniques to compare, group, and validate isotope-derived probability of origin models
- Projects completed:
 - New techniques for combining and interpreting the isotopic and distribution likelihood-of-origin models of migratory animals
 - Range-wide models of the migratory movements of North American tree bats

National Science Foundation East Asia and Pacific Summer Institute (NSF EAPSI) Research Fellow / Japanese Society for the Promotion of Science (JSPS) Summer Research Fellow, May 2016 – August 2016

Department of Biogeochemistry, Japan Agency for Marine Science and Technology (JAMSTEC), Yokosuka, Kanagawa Prefecture, Japan

- Applicability of compound-specific isotope analysis of amino acids (CSIA-AA) to identify the trophic levels of specialized species of microchiropteran bats
- Investigation of dietary ecology and trophic positions of migratory North American bats

- Derivatization of amino acids, quantification using gas chromatograph mass-spectrometer (GC/MS), analysis gas chromatograph isotope ratio mass spectrometer (GC/IRMS)

Endangered Bat Monitoring Crew Leader, May – July 2015

Arkansas State University / U.S. Forest Service, Jonesboro, AR

- Led crews of technicians to conduct presence/probable absence surveys for endangered *Myotis sodalis* (Indiana myotis) and threatened *M. septentrionalis* (northern long-eared myotis)
- Monitored species distributions with mist netting, harp trapping, acoustic monitoring and analysis (AnaBat), and radiotelemetry of *M. sodalis* and *M. grisescens* (grey myotis)

Bat Research and Management Technician, Jan – May 2015

New York Department of Environmental Conservation, Albany, NY

- Performed hibernacula surveys to assess population trends of endangered and unlisted bats
- Wrote and distributed reports and papers to government agencies, NGOs, and the public; coordinated surveys with local, regional, and state agencies
- Trained others in winter survey counts, acoustic surveys (Binary Acoustic systems), spring emergence surveys; data analysis and interpretation

Herpetofauna Ecology Research Assistant, Nov – Dec 2014

Florida International University, Sarapiquí, Costa Rica

- Conducted transect surveys and acoustic monitoring of amphibian and reptile species assemblages in successional forest matrix
- Examined morphological variations using ImageJ; designed models to measure operative temperature

Endangered Bat Species Monitoring Senior Research Technician, May – Aug 2014

Arkansas State University / U.S. Forest Service, Jonesboro, AR

- Performed presence/probable absence surveys for endangered *Myotis sodalis* populations
- Monitored species distributions with mist netting, harp trapping, acoustic monitoring and analysis, and radiotelemetry of *M. sodalis* and *M. grisescens*
- Training and supervision of research technicians

Field Ecologist, June – August 2014

Mitigation Surveying Services LLC, Benton, AR

- Monitoring for presence/probable absence of threatened and endangered bats on private lands; performed habitat delineation
- Mist netting, acoustic monitoring, pathology (white-nose syndrome) surveys, cave exit counts

Mammal Diversity Project Field Assistant, Jan – Apr 2014

Smithsonian Conservation Biological Institute, Chiapas, Mexico

- Daily setting and monitoring of Sherman and camera traps
- Small mammal trapping and handling
- Vegetation measurements for habitat characterization

Endangered Bat Species Survey and Research Technician, May – Aug 2013

Arkansas State University / U.S. Forest Service, Jonesboro, AR

- Performed compliance monitoring for endangered *Myotis sodalis* populations
- Monitored species distributions with mist netting, banding, and acoustic monitoring

Conservation Ecology Research Assistant, 2009 – 2013

Gund Institute of Ecological Economics, University of Vermont, Burlington, VT

- Assisted in research and production of publications on endangered species management; cetacean and pinniped population trends, community ecology, and management policy; invasive species ecology and control; and ecosystem services
- Coauthored paper on the efficacy of the Marine Mammal Protection Act: aggregated massive data set and analyzed for changes in species' conservation status, population size, and trends

Student Research Assistant, Feb – May 2011

Round River Conservation Studies, Wereldsend, Kunene Region, Namibia

- Designed and implemented study on human-wildlife conflict and wildlife predation of livestock
- Worked on vegetation and game surveys in conjunction with local NGOs and communities; assisted with study design, data collection and analysis, and community administration efforts

Invasive Species and Biocontrol Volunteer, 2007 – 2009

Nashua River Watershed Association, Groton, MA.

- Cultivated multiple generations of *Galerucella* spp. biocontrol agents with daily care; assisted with annual field sample collection, seasonal invasive species monitoring

Biodiversity and Administrative Intern, 2008

Massachusetts Audubon Society, Princeton and Worcester, MA.

- Performed GIS and resource surveys of habitat segments at risk of development to identify and evaluate wildlife corridors of conservation significance
- Assisted with administrative, technological running of sanctuaries and nature centers; led environmental education programs with public and school groups

TEACHING EXPERIENCE

Assistant Instructor, Global Change Ecology and Sustainability, Spring 2019 – Fall 2020

Department of Biology, University of Florida

- Assisted in administration and presentation of course centering on global-scale anthropogenic impacts on ecological systems. Objectives of this courses included: (1) discussion of climate change; biodiversity loss and species extinctions; invasive species; alterations to nitrogen, carbon, and phosphorous cycles; (2) comparison and critical analysis of management practices, mitigation schemes, and cultural and economic factors that can promote sustainability; and (3) apply ecological concepts to evaluate human impacts on global systems.
- Led online discussions on lecture topics and current events relevant to global change ecology and sustainability issues.
- Directed and graded interdisciplinary group capstone projects and individual reports.

Workshop Presenter, February 21, 2019.

From Haircuts to Origin Models: A Guide to Emerging Tools to Study Animal Movement by Stable Isotope Analysis. Caitlin J. Campbell. Combined annual meeting of the Southeastern Bat Diversity Network (SBDN) and Annual Colloquium on the Conservation of Mammals in the Southeastern U.S.. https://github.com/cjcampbell/AnimalOrigins_SBDN/

Instructor, X-Lab, Fall 2018

Cross-Disciplinary Laboratory, University of Florida

- Taught interdisciplinary 3-credit course integrating biology, chemistry, and physics laboratory coursework. Goals of this program included (1) increasing persistence in STEM through synthetic approach to natural sciences, (2) engage students in inquiry-based experiments modeled on authentic research practices, and (3) train students in key practical and theoretical research skills.

Graduate Assistant Teaching Fellow, January 2016 – May 2016

Frostburg State University Department of Biology, Frostburg, MD

- Taught Anatomy and Physiology II Laboratory (BIOL 322); 2-credit 110 minute laboratory twice weekly. Structure and function of the human body, including the endocrine, circulatory, respiratory, digestive, excretory, and reproductive systems, and human development.
- Assisted with Anatomy and Physiology II Lecture section and administration.

MENTORSHIP EXPERIENCE

Undergraduate research technicians mentored and supervised

University of Florida

Sierra Scauzillo (Wildlife Ecology and Conservation; 2020 – present);

Frostburg State University

Becca Phillips (2017); Sarah Sprouse (2017); Kamren Jefferson (2016); Jake Blakely (2016); Crystal Tippet (2016); Becca Hiller (2015-2016)

SERVICE AND COMMUNITY OUTREACH

Manuscript reviews

Animal Migration (2020)

STOTEM (2020)

Journal of Mammalogy (2020)

Acta Chiropterologica (2021)

Outreach

Biology Graduate Student Experience Panelist, Outreach event to provide new graduate students advice and support on navigating graduate school and research. Event sponsored by the Biology Graduate Student Association Mental Health Committee. February 27, 2019.

Graduate School Panel Biology Representative, Outreach event to provide undergraduate students advice about STEM graduate programs. Event co-sponsored by graduate student career-building club POLY/PMSE and chemistry fraternity Alpha Chi Sigma. Nov 15, 2019.

Graduate Student Writing Group, Founder and coordinator. Semi-weekly inter-institutional meetings of graduate students from University of Maryland Center for Environmental Science Appalachian Laboratory and the Department of Biology of Frostburg State University to workshop writing skills. Fall 2015 – Spring 2018.

Bat Ecology and Conservation, University of Maryland Center for Environmental Science Appalachian Laboratory Open House. Public outreach to community and families including bat ecology, behavior, ecosystem services, and conservation status. May 7, 2016.

Endangered Bats of Maryland, Presentation to local elementary school in rural Appalachia on natural history, ecology, threats, and legal status of local bats, Oct 2, 2015

Herpetofauna of Sarapiquí, Costa Rica. Educational presentation, live animal handling, and public outreach at La Selva Biological Station Open House, Nov 9, 2014

Living with Bears, Authored article for local online paper on coexisting with black bears in Massachusetts: “Your New Groton Neighbors, The Bears, May Be Dropping By.” TheGrotonLine.com. Nov 21, 2013

Community Conservation Technology Training, Week-long collaboration with Ehi-rovipuka conservancy conservation officers: training on data collection and database management, open-source document managers, email and outreach. Round River Conservation Studies, March 2012.

Invasive Species and Biocontrol Volunteer, Nashua River Watershed Association, Groton, MA, 2007-2009