# CAITLIN J. CAMPBELL

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## RECENT POSITIONS AND APPOINTMENTS

| | |
|---|---|
| Quantitative Ecologist, Bat Conservation International | 2023 – present |
| Graduate Fellow, University of Florida, Gainesville FL | 2018 – 2023 |
| Research Fellow, National Science Foundation &<br>Japanese Society for the Promotion of Science. Department of Biogeochemistry, Japan Agency for Marine Science and Technology, Yokosuka, Kanagawa, Japan | 2016 |
| Graduate Research Assistant, University of Maryland<br>University of Maryland Center for Environmental Science Appalachian Laboratory, Frostburg, MD | 2015 – 2018 |

## EDUCATION

| | |
|---|---|
| University of Florida, Department of Biology, Zoology<br>Advisor: Hannah B. Vander Zanden | Ph.D. 2023 |
| Frostburg State University & University of Maryland<br>Center for Environmental Science Appalachian Laboratory<br>Applied Ecology and Quantitative Biology.<br>Advisor: David M. Nelson | M.S. 2018 |
| University of Vermont<br>Environmental Science: Conservation Biology and Biodiversity.<br>Honors College Graduate | B.S. 2012 |

## PUBLICATIONS

** indicates authors with equal contributions*

### SELECTED SUBMITTED PUBLICATIONS

vi. **Campbell, CJ**; Nelson, DM; Nagel, J; Clerc, J; Weller, TJ; Weiringa, JG; Fraser, E; Longstaffe, FJ; Hale, AM; Lout, M; Pruitt, L; Guralnick, R; Vander Zanden, HB. Unusual migratory strategy a key factor driving interactions at wind energy facilities in at-risk bats. **BioRXiv**. [link]

v. **Campbell, CJ**; Cheng, T; Vander Zanden, HB. Migratory bats resistant to white-nose syndrome as cryptic vectors of fungal disease spread.

iv. Wilson, J*; True, M*; **Campbell, CJ**. Autumn migration to higher latitudes in Seminole bats (*Lasiurus seminolus*) redefines seasonal ranges: evidence from stable isotopes and fatality data from wind energy facilities.

iii. Rubin, J; **Campbell, CJ**; Carvalho, APS; St Laurent, RA; Crespo, GI; Pierson, TL; Guralnick, RP; Kawahara, AY. Macroevolutionary constraint and selection on anti-bat moth tails. **BioRXiv**. [link]

ii. Vinod Anand, A; **Campbell, CJ**; Loiselle, B; Guralnick, R. Precipitation tolerance determines elevational migration strategies of resident birds of the Western Ghats of India.

i. Nagel, J; Nelson, DM; **Campbell, CJ**; Trott, R; Wieringa, JG; Carstens, BC; Gibbs, HL; Baerwald, E; Carson, D; Clerc, J; Green, D; Hale, A; Johnson, B; Meekins, C; Pruitt, L; Romano, B; Stevenson, ER; Weaver, A; Williams, J; Gugger, PF. Range-wide population genetic structure and effective sizes of three migratory tree bat species impacted by wind-energy development in North America.

**PUBLISHED & IN PRESS**

16. Belitz, M; **Campbell, CJ**; Drum, RM; Leuenberger, W; Morelli, TL; Nail, J; Shirey, V; Warner, S; Thogmartin, W; Zipkin, EF. A case for community assemblage-level conservation to address the biodiversity crisis. ***Nature Reviews Biodiversity***. In press.
15. **Campbell, CJ**; Gardner, JH; Rushing, CS; Norvell, R; Farr, CM; Savides, K. Quantifying rosy-finch migration with stable hydrogen isotope feather markers highlights the need for inter-state collaboration to reach conservation goals. ***Avian Conservation and Ecology***. In press.
14. Carpenter, B*; **Campbell, CJ***; Fanning, A; McBride, M. 2024. Migratory mixing of *Gallinago delicata* (*Wilson's Snipe*) in wintering areas highlights the need for international coordination for monitoring and management. ***Ornithological Applications***. duae064. [link]
13. **Campbell, CJ**; Cheng, T; Akre, K; Adams, A; Solick, D; Bennett, A; Newman, C; Frick, W. Maximizing benefits to bat populations through management of power line corridors. 2024. ***Ecological Solutions and Evidence***. 5 (4), e12392. [link]
12. Adams, A.M. Trujillo, L.A.; **Campbell, C.J.**; Akre, K.L.; Arroyo-Cabrales, J.; Burns, L.; Coleman, J.T.H.; Morris, K. M.; Ortega, J.; Reichard, J.D.; Reichert, B.; Segers, J.L.; Whitby, M.D.; Frick, W.F. 2024. The State of the Bats in North America. ***The Annals of the New York Academy of Sciences***. 1–14. [link]
11. Wieringa, JM; Nagel, J; **Campbell, CJ**; Nelson, DM; Carstens BC; Gibbs, HL. 2024. Geographic sources of bats killed at wind-energy facilities in the eastern United States. ***PeerJ*** 12, e16796. [link]
10. **Campbell, CJ**; Barve, V; Belitz, M; Doby, J; White, E; Seltzer, C; Di Cecco, G; Hurlbert, A; Gurlanick, R. 2023. Identifying the Identifiers: How community processes generate consensus taxonomic knowledge in iNaturalist and why it matters for biodiversity science. ***BioScience*** 73(7), 533-541. [link]
9. McCleery, R; Guralnick, R; Kang, K;, Beatty M; Potash, A; Jones, M; **Campbell, CJ**; Belitz, M; Idec, J; Fletcher, R. 2023. Uniting experiments and big data to advance conservation. ***Trends in Ecology and Evolution***. [link]
8. Wieringa, JG; Nagel, J; **Campbell, CJ**; Nelson, DM; Carstens, BC; Gibbs, H L. 2023. Combining stable isotopes, trace elements, and distribution models to assess the geographic origins of migratory bats. ***Ecosphere*** 14 (6), e4588. [link]
7. Smith, LM; Doonan, TJ; Gore, JA; **Campbell, CJ**. 2022. Tricolored bats at a southern range edge exhibit partial migration northward in autumn. ***Movement Ecology*** 10(56). [link]
6. **Campbell, CJ**; Nelson, DM; Gates, J E; Gibbs, H L; Stevenson, E R; Johnson, B; Nagel, J; Trott, R; Wieringa, J G; Vander Zanden, H B. 2022. White-nose syndrome pathogen detected on migratory tree-roosting bats. ***Journal of Wildlife Diseases*** 58 (3): 652–657. [link]
5. **Campbell, CJ**; Fitzpatrick, MC; Vander Zanden, H; Nelson, DM. 2020. Advancing interpretation of stable isotope assignment maps: comparing and summarizing origins of known-provenance migratory bats. ***Animal Migration*** 7(1), 27–41**.** [link]
4. Katzner, TE; Nelson, DM; Diffendorfer, JE; Duerr, AE; **Campbell, CJ**; Leslie, D; Vander Zanden, HB; Yee, JL; Sur, M; Huso, MMP; Braham, MA; Morrison, ML; Loss, SR; Poessel, SA; Conkling, TJ; Miller, TA. 2019. Wind energy: An ecological challenge. ***Science*** *366*(6470):1206–1207. [link]
3. Nelson, DM; Nagel, J; Trott, R; **Campbell, CJ**; Pruitt, L; Good, RE; Iskali; G, Gugger, PF. 2018. Carcass age and searcher identity affect morphological assessment of sex of bats. ***The Journal of Wildlife Management***. *82*(8), 1582-1587. [link]
2. **Campbell, CJ**; Nelson, DM; Ogawa, NO; Chikaraishi, Y; Ohkouchi, N. 2017. Trophic position and dietary breadth of bats revealed by nitrogen isotopic composition of amino acids. ***Scientific Reports*** 7:15932. [link]
1. Roman, J; Altman, I; Dunphy-Daly, M; **Campbell, C**; Jasny, M; 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. [link]

### THESES

Campbell, C. J. 2023. New methods to understand the patterns and consequences of animal migration in a changing world. Doctoral dissertation, Department of Biology, University of Florida, Gainesville, FL.

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.

## SOFTWARE

3. geoshift: Metrics to Compare Temporally-Explicit Species Distribution Models. 2022. **Campbell** & Belitz. [Release] [GitHub]
2. phenesse: Estimate Phenological Metrics using Presence-Only Data. 2019. Belitz, M; **Campbell, CJ**; Li, D. [Release] [GitHub]
1. isocat: Isotope Origin Clustering and Assignment Tools. 2018. **Campbell**. [Release] [GitHub]

## HONORS AND AWARDS

### RESEARCH GRANTS & FELLOWSHIPS

#### *SELECTED IN REVIEW*

U.S. Department of Energy: Technology Advancement to Inform Risk to Birds and Bats from Offshore Wind Energy. $2,521,982 (Lead PI).

New Jersey Offshore Wind Research & Monitoring Initiative. $500,000 (co-PI).

#### *AWARDED*

2023. Threadgill Dissertation Fellowship, College of Liberal Arts and Sciences, University of Florida. $8,000

2022– 2023. University of Florida Biodiversity Institute Fellowship. $21,000.

2021 – 2022. University of Florida Department of Biology: Michael L. May Interdisciplinary Grant. *Project BatCast: public outreach through ecological modeling*. $1,000. CJ Campbell (co-lead PI) & Aditi Jayarajan.

2021. University of Florida Department of Biology: Riewald Fund Research Grant. $300 (sole PI).

2019. University of Florida Biodiversity Institute Summer Fellowship. $4,000.

2019. Michael May Graduate Student Fellowship in Biology. $4,000.

2018 – 2023. Graduate Student Funding Award Fellowship, Department of Biology, University of Florida. $120,000.

2016. National Science Foundation: East Asia and Pacific Summer Institute Research Fellowship. *Using Amino-acid Isotopes to Investigate Dietary Patterns and Specialization of Bats*. $5,400 (sole PI) OISE 1614267.

2016. Japanese Society for the Promotion of Science: Summer Research Fellowship. *Using Amino-acid Isotopes to Investigate Dietary Patterns and Specialization of Bats*. $5,200 (sole PI).

### AWARDS AND HONORS

2024. XPrize Rainforest: $5,000,000 first place prize. Member of Team Limelight, lead of bat bioacoustics and biodiversity informatics. [XPrize Rainforest][Limelight]

2017. Student Presentation Award, North American Society for Bat Research Annual Symposium

2016. Best Student Poster, North American Society for Bat Research Annual Symposium

2012. Honors Graduate of the College of Arts and Sciences, University of Vermont.

2011. Benjamin A. Gilman International Scholarship. $5,000.

2010. Round River Conservation Studies Ed Abby Scholarship. $1,000.

2008 – 2012. Presidential Scholarship, University of Vermont. $10,500.

## SELECTED PRESENTATIONS

### INVITED

*Migration and biogeography of the hoary bat (*Lasiurus cinereus*).* Campbell, CJ. Renewable Energy Wildlife Institute. October 29, 2024. Virtual webinar, 558 registered attendees. [link]

*Revealing rosy-finch migrations using stable isotope analyses.* Campbell, C. J. February 22, 2022. Rosy-finch Working Group Symposium. Virtual presentation.

### CONTRIBUTED

*Leveraging participatory science data to quantify migration phenology and monitor bat populations year-round.* Campbell, CJ; Clerc, J; Dempsey, L; Frick, W; O'Mara, MT; Whitby, M; Weller, T. October 24, 2024. North American Society for Bat Research, Guadalajara, Jalisco, MEX.

*Migration is a key factor driving distribution and interactions with energy development in at-risk bats.* Campbell, CJ; Nelson, NM; Nagel, J; Clerc, J; Gurlanick, R; Vander Zanden, HB. October 12, 2023. North American Society for Bat Research, Winnipeg, Manitoba, CAN.

*Identifying the Identifiers: How iNaturalist facilitates collaborative, research-relevant data generation and why it matters for biodiversity science*. Campbell, CJ; Barve, V; Belitz, M; Doby, J; White, E; Seltzer, C; Di Cecco, G; Hurlbert, AH; Guralnick, R. April 18, 2023. University of Florida Biodiversity Institute Symposium, Gainesville, FL.

*High-resolution seasonally-explicit distribution models reveal bat migration at the macroecological scale*. Campbell, CJ; Belitz, M; Guralnick, R; Fletcher, RJ; Vander Zanden, HB. August 9, 2022. North American Society for Bat Research, Austin, TX.

*The R package 'isocat', a toolset for comparing and summarizing origins of animals inferred from stable isotope data.* Campbell, CJ; Fitzpatrick, MC; Vander Zanden, H; Nelson, DM. May 20, 2021. Oral Presentation. Applications of Stable Isotope Techniques to Ecological Studies (IsoEcol), virtual meeting.

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

*A review of cave and mine use by tree-roosting bats.* Campbell, CJ & Vander Zanden, HB. 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.

*Hydrogen isotopes reveal complex seasonal migratory structure in at-risk tree-roosting bats in North America*. Campbell, CJ & Nelson, DM. 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*. Campbell, CJ & Nelson, DM. Oral presentation. International Congress for Conservation Biology, Kuala Lumpur, Malaysia; July 24, 2019 & International Bat Research Conference, Phuket, Thailand, July 31, 2019

*Range-Wide Migratory Patterns of North American Tree-Roosting Bats*. Campbell, CJ; Fitzpatrick, M; Nelson, DM. Oral presentation (Student Presentation Award). 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.* Campbell, CJ; Fitzpatrick, M; Nelson, DM. Oral presentation. 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*. Campbell, CJ; Nelzon, DM; Ogawa, N; Chikaraishi, Y; Okhouchi, N. October 13, 2016. Poster presentation (Best Student Poster Award). North American Society for Bat Research Annual Symposium, San Antonio, TX.

## TEACHING EXPERIENCE

### COURSES

Teaching Assistant, *Global Change Ecology and Sustainability*, Spring 2019 – Fall 2020. Department of Biology, University of Florida

Instructor, *X-Lab cross-disciplinary laboratory*, Fall 2018. Applied skills and inquiry-based laboratory integrating intensive introductory biology, chemistry, and physics. University of Florida

Instructor*, Anatomy & Physiology Laboratory.* January 2016 – May 2016. Frostburg State University Department of Biology, Frostburg, MD

### GUEST LECTURES

*Assessing the capacity for migratory bats to serve as long-distance vectors of white-nose syndrome pathogen Pseudogymnoascus destructans,* April 5 2021. Behavioral Drivers of Disease (ZOO4926), Department of Biology, University of Florida, Gainesville, FL.

*Bat migration in a changing world*, November 29, 2022. Animal Migration: Journeys by Air, Land and Water (ZOO4926), Department of Biology, University of Florida, Gainesville, FL.

*Bats! A Brief Introduction to Microchiroptera*. July 6, 2016. Department of Biogeochemistry, Japanese Agency of Marine Science and Technology, Yokosuka, Kanagawa, Japan.

### WORKSHOPS

**Data and Software Analysis**

*Data analysis and visualization in R for ecologists.* Organizer and instructor, September 19-20, 2022

*Data analysis in R.* Instructor, February 22–23, 2022

*Introduction to R.* Instructor: January 31–February 1, 2022; September 27–28, 2021. Helper: January 25–26, 2021

*Introduction to Geospatial Analysis in R.* Helper, March 22–23, 2021

*Introduction to Python, Shell, and Git.* Helper, April 11–12, 2022

**Stable Isotope Analysis**

*From Haircuts to Origin Models: A Guide to Emerging Tools to Study Animal Movement by Stable Isotope Analysis*. Workshop Presenter, February 21, 2019. Combined annual meetings of the Southeastern Bat Diversity Network (SBDN) and Annual Colloquium on the Conservation of Mammals in the Southeastern U.S. [link]

## MENTORING ACTIVITIES

### GRADUATE STUDENT MENTORSHIP

**Panelist** at Biology Graduate Student Experience event — Feb 27 2019

Outreach 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.

**Panelist** for University of Florida Graduate School — Nov 15 2019

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.

**Founder & Coordinator**, Graduate Student Writing Group — 2015 –2018

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.

### UNDERGRADUATE MENTORSHIP

**Independent Research** by Sierra Scauzillo of the University of Florida Wildlife Ecology and Conservation. Data collection and quantitative synthesis of bat trait data. 2020 – 2022.

**Stable isotope analysis**. Wet lab sample preparation and analysis, data management. Becca Phillips (2017), Sarah Sprouse (2017), Becca Hiller (2015-2016).

Kamren Jefferson (2016); Jake Blakely (2016**)**; & Crystal Tippet (2016) co-led presentation on their stable isotope research at Frostburg State University Undergraduate Research Symposium, May 6, 2016. Kamren is now a biologist with the U.S. EPA.

## RESEARCH EXPERIENCE & PROFESSIONAL DEVELOPMENT

**Crew Leader**, Endangered Bat Monitoring. Summer 2015
Arkansas State University / U.S. Forest Service, Jonesboro, AR.

**Research Technician**, Bat Research and Management Jan – May 2015
New York Department of Environmental Conservation, Albany, NY

**Research Assistant**, Herpetofauna Ecology Nov – Dec 2014
Florida International University, Sarapiqui, Costa Rica

**Senior Research Technician**, Endangered Bat Monitoring May – Aug 2014
Arkansas State University / U.S. Forest Service, Jonesboro, AR

**Field Ecologist**, Endangered Bat Monitoring June – Aug 2014
Mitigation Surveying Services LLC, Benton, AR

**Field Assistant**, Mammal Diversity Monitoring Jan – Apr 2014
Smithsonian Conservation Biological Institute, Chiapas, Mexico

**Research Technician**, Endangered Bat Species Survey May – Aug 2013
Arkansas State University / U.S. Forest Service, Jonesboro, AR

**Research Assistant**, Conservation Ecology 2009 – 2013
Gund Institute of Ecological Economics, University of Vermont, Burlington, VT

**Student Research Assistant** Feb–May 2011
Round River Conservation Studies, Wereldsend, Kunene, Namibia

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

**Intern**, Biodiversity and Administration 2008
Massachusetts Audubon Society, Princeton and Worcester, MA

### SELECTED PROFESSIONAL DEVELOPMENT

Radar Aeroecology Workshop. Radar remote sensing, data visualization, and data processing. University of Delaware. Aug 2024

Inclusive Field Safety: Developing Field Safety Standards and Guidelines for Diverse Researchers. Interactive workshop session, North American Congress for Conservation Biology. Jun 2024

Bat acoustic analysis. Workshop, Northeastern Bat Working Group Jan 2024

Instructor training. Inclusive pedagogy for teaching data science and programming. Certification from The Carpentries [link]. Fall 2021

AI in Biology. Computer vision, deep learning, Python programming. 3-credit course, University of Florida. [link] Spring 2021

Geospatial analysis in R. Two-day training, UF Software & Data Carpentry May 2019

## ENGAGEMENT, SERVICE, AND OUTREACH

### SERVICE

**Peer reviewer**

2024: *Acta Chiropterologica*, *BioScience*, *Ecology* (x2)*, Herpetological Conservation and Biology*, *Ornithology*, *Progress in Earth and Planetary Science*

2023: *Acta Chiropterologica*, *Diversity and Distributions*, *Journal of Wildlife Management* (x2)

Previously: *Animal Migration*, *Science of The Total Environment*, *Journal of Mammalogy* (x2), *Journal of Wildlife Management*

**Board Member** 2021 – 2023
University of Florida Carpentries Organization. Workshops and curriculum development of Software and Data Carpentry workshops for community members. uf-carpentries.org.

**Code of Conduct Representative** 2022 – 2023
University of Florida Biology Graduate Student Organization

## AFFILIATIONS

**Memberships**
Ecological Society of America; North American Society for Bat Research (2015 – present); Society for Conservation Biology; RLadies (2017 – 2020)

**Working groups**
Northeastern Bat Working Group (2015 – 2018; 2023 – present); Florida Bat Working Group (2017 – 2023); Rosy-finch working group (2022); Southeastern Bat Diversity Network (2013 – 2015; 2017 – 2023)

## MEDIA

**X Prize Rainforest Team Limelight**. "Florida Museum curator helps team score 1st-place and $5 million in international biodiversity competition." *Florida Museum of Natural History Research News.* November 18, 2024. [link]

**Project BatCast**, University of Florida. [link]

## PUBLIC OUTREACH

**iNaturalist identifier**, 2019-present. Active identifier of bat observations posted to public science platform iNaturalist (inaturalist.org), provides outreach and advice on bat identification and coexistence. Identified > 13,000 observations, ranked fourth most active bat identifier globally.

**Director, Project BatCast**, 2021-2023. Outreach research initiative to engage with the public on bat biology and conservation. cjcampbell.github.io/BatCast; twitter.com/uf_bats

**iDigTRIO Outreach,** February 24, 2022. Guide for iDigTrio Biology Career Conference and Fair at University of Florida: idigtrio.org

**Open House Host,** 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.

**Elementary School Outreach**, 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

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

**Author,** 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 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.

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