JESSICA L. BURNETT

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Education

Ph.D., Natural Resource Sciences 2015 - 19
School of Natural Resources, University of Nebraska-Lincoln, Nebrasaka USA

- Thesis: Regime Detection Methods for the Practical Ecologist
- Recipient of 2 prestigious and competitive university Fellowships (Fling and Othmer)
- Recipient of Meritorious Graduate Student award (1 awarded annually)

M.Sc., Wildlife Ecology & Conservation 2013 - 15
Department of Wildlife Ecology & Conservation, University of Florida, Florida USA

- Thesis: House Sparrow *(Passer domesticus)* decline and distribution in North America

B.Sc. Wildlife Ecology & Conservation 2010 - 13
Department of Wildlife Ecology & Conservation, University of Florida, Florida USA

- Undergraduate research thesis published (avian playback methodology)
- Internship with the Florida Wildlife Research Institute (GIS analyst)

A.A. Valencia Community College 2008 - 10

Skills Highlight

- Program R, version control, open science, GIS
- Data quality assessment and quality control, data management
- Citizen science and long-term monitoring data
- Population trends and parameter estimation
- Collaborative research
- Time series analysis
- Geospatial analysis

Professional Experience

Graduate research assistant August 2015 - present
Nebraska Cooperative Fish & Wildlife Research Unit, School of Natural Resources
University of Nebraska-Lincoln, Nebraska, USA

- Published 8 peer-reviewed scientific articles (additional 1 under review) and 1 invited book chapter
- Created statistical software for calculating various abrupt change metrics, with a focus on ecological data (see GitHub: `regimeDetectionMethods`, `bbsRDM`
- Assisted with creation of two R packages:
  - `radsets`: An R package for interactive, network-based visualizations of overlapping sets
  - `TVdiff`: An R package for implementing numerical differentiation of noisy, non-smooth data

- Designed and instructed of workshops for managing and analyzing ecological data using Program R
- Co-organizer of half-day research symposium at national conference (North American Ornithological Conference)

Research fellow May - September 2018
Applied Systems Analysis Research Group
International Institute for Applied Systems Analysis, Laxenburg, Austria

- Research sabbatical advised by applied mathematician (E. Rovenskaya) and systems ecologist (B. Fath)
- Presented research to an international audience
- Organized seminar on Network Analysis

Graduate teaching assistant August 2013 - August 2015
Department of Wildlife Ecology & Conservation
University of Florida, Florida, USA

- Published 2 peer-reviewed scientific articles
- Invited lectures in citizen science data, wetland birds

Geospatial Analyst Intern April - August 2012
Florida Fish and Wildlife Research Institute
Gainesville, Florida, USA

- Researched relationships among land cover and American Kestrel *(Falco sparverius)* nest success
- Ground-truthed GIS data

Research Assistant January 2011 - April 2012
Avian Ecology and Conservation Lab
University of Florida, Gainesville, FL, USA

- Managed bird banding database
- Conducted avian behavioral research in field
- Designed and implemented project resulting 1 peer-reviewed manuscript

Crew Leader, Smithsonian Fellow April-September 2011 and April-September 2013
Neighborhood Nestwatch Program
Smithsonian Migratory Bird Center, Gainesville, FL, USA

- Trained and led team of banding technicians
- Managed bird banding database; data QA/QC
- Recruited and trained citizen scientists
- Banded and measured breeding birds in backyards using

Peer-reviewed publications

1. Donovan, V.M., **J.L. Burnett**, C.H. Bielski, H.E. Birge, R. Bevans, D. Twidwell, and C.R. Allen. (2018) Social-ecological landscape patterns predict woody encroachment from native tree plantings in a temperate grassland *Ecology and Evolution* 8(19): 9624-9632 DOI:10.1002/ece3.4340
2. **Burnett, J.L.**, K.L. Pope, A. Wong, C.R. Allen, D.M. Haak, B.J. Stephen, and D.R. Uden. 2018. Thermal tolerance limits of the invasive Chinese mysterysnail *Bellamya chinensis* and implications for management". *American Malacological Bulletin* 36(1): 140-144 DOI:10.4003/006.036.0106
3. Roberts, C.P., D. Twidwell, **J.L. Burnett**, V.M. Donovan, C. Wonkka, C.H. Bielski, A.S. Garmestani, D.G. Angeler, T. Eason, B.W. Allred, M.O. Jones, D.E. Naugle, S. Sundstrom, C.R. Allen, (2018) Early warnings for state transitions. *Rangeland Ecology and Management* DOI:10.1016/j.rama.2018.04.012
4. La Sorte, F.A., C.A. Lepczyk, **J.L. Burnett**, A. Hurlbert, M. Tingley, and B. Zuckerberg. 2018. Opportunities and challenges for big data ornithology. *The Condor* 120(2): 414-426 DOI:0.1650/

CONDOR-17-206.1

5. Chuang, W.C., A.S. Garmestani, T. Eason, T.L. Spanbauer, H.B. Fried-Peterson, C. Roberts, S. Sundstrom, **J.L. Burnett**, D. G. Angeler, B. Chaffin, L. Gunderson, D. Twidwell, C.R. Allen. 2018. Enhancing quantitative approaches for assessing ecological and community resilience. *Journal of Environmental Management* 213: 353-362 DOI:10.1016/j.jenvman.2018.01.083
6. **Burnett, J.L.**, C.R. Allen, C.P. Roberts, M.Bomberger Brown, and M.P. Moulton. 2017. Eurasian Tree Sparrow (*Passer montanus*) range expansion in North America. *Biological Invasions* 19(1): 5-9 DOI:10.1007/s10530-016-1273-4
7. **Burnett, J.L.** and K.E. Sieving. 2016. Songbird distress call as a detection enhancement method and application to Red-shouldered Hawks (*Buteo lineatus*). *Florida Field Naturalist* 44(4):157-168
8. C.R. Allen, H.E. Birge, S.L. Bartlet-Hunt, R.A. Bevans, **J.L. Burnett**, B.A. Cosens, X. Cai, A.S. Garmestani, I. Linkov, E.A. Scott, M.D. Solomon, and D.R. Uden. 2016. Avoiding decline: Fostering resilience and sustainability in midsize cities. *Sustainability* 8(9):844-868 DOI:10.3390/su8090844
9. **Burnett, J.L.** and M.P. Moulton. 2015. Recent trends in House Sparrow (*Passer domesticus*) distribution and abundance in Gainesville, Alachua County, Florida. *Florida Field Naturalist* 43(4):167-172

First-authored manuscripts under review

1. **Burnett, J.L.**, R. Wilcox, B. Stephen, D. Haak, D. Uden, C.R. Allen, and K. Pope. Shell strength does not limit predation of an invasive snail species (Bellamya chinensis) by native fish. *under review at Malacological Bulletin*

First-authored manuscripts in preparation (available upon request)

1. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, and D. Twidwell. A guide to Fisher Information for ecologists.
2. **Burnett, J.L.**, N.B. Price, C.R. Allen, D. Twidwell, A.J. Tyre. Velocity of distance travelled as a measure of ecosystem trajectory and abrupt change.
3. **Burnett, J.L.**, Z. Warren, M. Podebrovska, B. Dueker, K. Lamke, B. Seguin, D. Twidwell, and C.R. Allen. Sexual size dimorphism in mammalian communities of Mediterranean Australian regions.
4. **Burnett, J.L.**, L. Wszola, N. Mirochnitchenko, E. Stuber, M. Bomberger Brown, C.R. Allen, D. Twidwell, and J. Carroll. Large-scale crop patterns influence Gray Partridge (*Perdix perdix*) site occupancy in North America.

Software

Author and maintainer

1. **Burnett, J.L.**, N.B. Price. 2019. `regimeDetectionMeasures`. An R package for calculating univariate and multivariate regime detection methods using community time series. Github:trashbirdecology/regimedetectionmeasures
2. **Burnett, J.L.**, N.B. Price, and A.J. Tyre. 2018. `distanceTravelled`. An R package for calculating the distance traveled by a multispecies community along a time series. Github:trashbirdecology/distancetravelled

Author

1. Price, N.B., C. Chizinski, and **J.L. Burnett**. `radsets`. 2019. An R package for interactive, network-based visualizations of overlapping sets. Github:natbprice/radsets
2. Price, N.B. and **J.L. Burnett**. `tvdiff`. 2019. An R package for numerical differentiation of noisy, non-smooth data. Github:natbprice/tvdiff

Grants

for research

- National Academy of Sciences research award **$5,500** 2018
- IFAS Extension Internship for Undergraduate Research, University of Florida **$2,200** 2013
- Ordway-Swisher Biological Station Undergraduate Research Grant, University of Florida **$550** 2013

for travel

- University of Nebraska Graduate Travel Fund **$750** 2019
- Association for Women in Mathematical Biology **$650** 2019
- National Science Foundation & NimBios **$550** 2018
- School of Natural Resources, University of Nebraska-Lincoln **$250** 2019
- Kellogg Biological Station, Michigan State University **$500** 2017
- Nelson Memorial Fellowship, University of Nebraska-Lincoln **$3,217** *(3x recipient)* 2016 - 18
- Center for Great Plains Studies, University of Nebraska-Lincoln **$3,000** *(4x recipient)* 2015 - 18
- American Ornithologists' Union **$250** 2016
- NSF Diversity Award, Southeastern Ecology and Evolution Conference **$650** 2015
- Graduate Student Council, University of Florida **$350** 2015
- Office of Research, University of Florida **$500** 2015
- Department of Wildlife Ecology & Conservation, University of Florida **$500** *(2x recipient)* 2014 - 15
- Office of the Dean, Institute of Food and Agricultural Sciences, University of Florida **$750** 2013

for societal membership

- American Ornithologists' Union Undergraduate Student Membership Award 2013

Awards and Honors

- Meritorious Graduate Student, School of Natural Resources, University of Nebraska-Lincoln 2018
- Invited Participant, Research Collaboration Workshop for Women in Mathematical Biology 2018
- Fling Fellow, University of Nebraska-Lincoln **$20,000** 2016
- Othmer Fellow, University of Nebraska-Lincoln **$24,000** 2015 - 19
- Big Ten Academic Alliance Travelling Scholar 2017
- AAAS/Science Program for Excellence in Science Award 2016
- Graduate Fellow, Center for Great Plains Studies, University of Nebraska 2016 - 18
- 2nd place, School of Natural Resources Elevator Speech Competition **$300** 2016
- Resilience Alliance Young Scholar, The Resilience Alliance 2015 - 17

Teaching Experience

Co-instructor 2017

Introduction to Applied Ecological Statistics, Kearney, NE

- Week-long workshop for employees of the Nebraska Game and Parks Commission employees

Instructor 2017
Introduction to Prorgam R

- Designed and taught a series of half-day workshops for graduate students
- Basics of data management and analysis using Program R

Guest Lecturer 2016
Module: using citizen science data to understand ecological invasions; Course: Avian Invasions

- Designed and taught series of lectures on citizen science data

Teaching Assistant 2015

Wildlife Population Ecology, Department of Wildlife Ecology & Conservation, University of Florida

- Lead quantitative laboratory sessions, grading

Teaching Assistant 2015

Ecological Statistics (online-only course), Department of Wildlife Ecology & Conservation, University of Florida

- Lead and moderate discussions, grading

Guest Lecturer 2013
Wetland birds module, Florida Master Naturalist

- Designed and taught lecture on wetland bird identification and ecology

Research Presentations

invited

1. Detecting abrupt change in bird community time series using distance travelled. *Association for Women in Math Biology Symposium*, Special session "Current Challenges in Mathematical Biology", Houston, TX, 2019
2. Decline of the Once-Ubiquitous House Sparrow in North America. *Nebraska Invasive Species Council*, Lincoln, NE, 2015

contributed

1. **Burnett, J.L.**, N.B. Price, and A.J. Tyre. A novel method for tracking ecosystem trajectory and abrupt change in space-time: distance traveled. *International Association for Landscape Ecology*, Oral presentation. Fort Collins, CO, 2019
2. **Burnett, J.L.**, R. Crystal-Ornelas, D. Fogarty, K. Hogan, C.R. Allen, M. Bomberger Brown, D. Twidwell, and C.A. Lepczyk. Impacts of non-native birds on native wildlife in urban ecosystems: where is the evidence? *Natural Areas Conference*, Oral presentation. Indiana, 2018
3. **Burnett, J.L.**. Advances in ecological regime shift detection, *International Institute for Applied Systems Analysis*, Oral presentation. Laxenburg, Austria, 2018

4. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler,and D. Twidwell. Community velocity as a regime shift detection method. *Great Plains Grassland Summit*, Poster presentation. Denver, Colorado, 2018
5. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler,and D. Twidwell. System trajectory and Fisher information as early-warning indicators of ecological regime shifts. *Resilience 2017: Resilience Frontiers for Global Sustainability*, Poster presentation. Stockholm, Sweden, 2017
6. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler,and D. Twidwell. System trajectory and Fisher information as early-warning indicators of ecological regime shifts. *Ecological Society of America*, Poster presentation. Portland, OR, 2017
7. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D., and Tyre, A.J. Ecological Regime Shifts in the Central Great Plains. *Great Plains Symposium*, Oral presentation. Nebraska Innovation Campus, Lincoln, NE, 2017
8. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D., and Tyre, A.J. Using Big Data to Detect Regime Shifts in Space and Time. *North American Ornithological Conference VI*, Poster presentation. Smithsonian Migratory Bird Institute, Washington, D.C., 2016
9. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M., and Robinson, S.K. Are House Sparrow declines a byproduct of urban greening? Southeastern Ecology and Evolution Conference, Oral presentation. University of Georgia, Athens, GA, 2015
10. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M.L., and Robinson, S.K. Are House Sparrow declines a byproduct of urban greening? *American Ornithologists' Union and Cooper Ornithological Society Annual Meeting*, Poster presentation. Norman, OK, 2015
11. **Burnett, J.L.**, Moulton, M.P., and Sieving, K.E. House sparrow: the decline of a once ubiquitous, invasive species. *Florida Chapter of The Wildlife Society Annual Conference*, Poster presentation. Safety Harbor, FL, 2014.
12. **Burnett, J.L.** and Sieving, K.E. Detecting birds of prey using tufted titmouse distress calls. *USGS Florida Cooperative Fish and Wildlife Research Unit Committee Meeting*, Poster presentation. Gainesville, FL, 2013
13. **Burnett, J.L.** and Sieving, K.E. Do actual and perceived risks of small forest birds align? *Florida Ornithological Society Conference, Oral presentation*, St. Petersburg, FL, 2013
14. **Burnett, J.L.** and Sieving, K.E. Perceived predation risks of small forest birds. *Association of Field Ornithologists Annual Conference*, Poster presentation. Venus, FL, 2013

Outreach

blogs

- Connecting to nature and understanding ecosystem services: urban perspective, Envirobites
- Big data, big problems, Resilience Alliance
- Panarchy in the Anthropocene, Resilience Alliance - Regime shifts, traps and how to deal with them, Resilience Alliance
- Connecting to nature and understanding ecosystem services: the urban perspective, Resilience Alliance
- Leadership resilience and your workplace, Resilience Alliance

radio

- House Sparrow declines in North American, Urban Wildlife Podcast

Recent Service

to the profession

- Reviewer for *Bioinvasions Records* (1), *Ecological Modelling* (2), *Plos ONE* (1), *Wilson Journal of Ornithology* (2)
- Student liaison, Urban Ecosystem Ecology Section, Ecological Society of America 2015 - 16

to the University of Nebrsaka-Lincoln

- Co-founder, Natural Resources Diversity Initiative committee, School of Natural Resources 2017
- Co-founder, Institutional membership to the Association for Women in Science 2016
- Student Representative, Faculty Advisory Committee, School of Natural Resources 2016
- Student Representative, Digital Team, School of Natural Resources 2016
- Organizer, Association for Women in Science Mentor Workshop 2016
- Seminar Coordinator, School of Natural Resources 2016
- Department Representative, UNL Graduate Student Association 2015 - 16

Technical Reports

1. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D. 2017. White Paper: Regime Shift Detection Using Fisher Information. Strategic Environmental Research and Development Program (SERDP), Department of Defense.

2. Allen, C.R., Angeler, D.G., Twidwell, D., **Burnett, J.L.**, Roberts, C.P. 2017. Interim Report (RC 25-10): Global Change, Vulnerability, and Resilience: Management Options for an Uncertain Future. Strategic Environmental Research and Development Program (SERDP), Department of Defense.

3. Twidwell D., Bielski, C.H., **Burnett, J.L.**, Donovan, V.M., Wonkka, C.L. 2017. Review of LANDFIRE Biophysical Settings Models (BpS) in the Great Plains. LANDFIRE Project.