

Contact

Biology Department
Franciscan University of Steubenville
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Education

- 2018 **Ph.D.**, Ecology, University of North Carolina at Chapel Hill
Advisor: Robert K. Peet
Dissertation: Long-term temporal dynamics of the Duke Forest
- 2011 **B.S.** Biology, *summa cum laude*, Saint Vincent College
Advisor: Cynthia A. Walter
Thesis: Bat foraging in riparian zones: Responses to stream quality, insect abundance & season

Teaching Experience

Academia

- 2020-Present **Assistant Professor of Biology**, Franciscan University of Steubenville, OH
- 2018-2020 **Assistant Professor of Biology**, Malone University, Canton, OH
Integrating critical thinking and faith into the science classroom through ecology, botany, general biology, environmental science, zoology, and human anatomy courses.
- 2017 **Adjunct Professor:** General Biology Lecture and Lab, Shaw University, Raleigh, NC
Developed an introductory Biology course for non- majors that emphasized concepts of human systems, cellular biology, and population level biology. Emphasized critical thinking and scientific approach through class activities and assignments.
- 2013-2018 **Lab Instructor / Teaching Assistant:** Human Anatomy & Physiology, University of North Carolina, Chapel Hill, NC.
Developed and presented lectures that emphasized critical thinking; provided one-on-one instruction using a contextualized learning approach in small-lab (<30 students) settings.
- 2015, 2016 **Head Teaching Assistant / Lab Instructor:** Human Anatomy & Physiology, University of North Carolina, Chapel Hill, NC.
Improved & standardized content and updated material to emphasize critical thinking; created instructional guidelines for students and instructors; managed TA team and created exams.
- 2012 **Teaching Assistant / Recitation Instructor:** Introduction to Environment and Society, University of North Carolina, Chapel Hill, NC.
Emphasized critical thinking, discussion and effective writing through active learning and constructive response.
- 2011 **Teaching Assistant:** Ecology, Saint Vincent College, Latrobe, PA.
Emphasized critical thinking and effective writing; instructed on field methods and statistics.

Public

- 2014-2016 **Recycling Educator and Assistant**, Orange County Solid Waste Management, NC.
Instructed and demonstrated proper recycling methods, informed residents of waste stream fundamentals, and provided general outreach and accessibility of information.
- 2009 **Environmental Educator / Assistant to Park Naturalist**, Keystone State Park, Derry, PA.
Led and assisted with park-wide environmental education through nature hikes, nature tours, presentations and demonstrations for both children and adults.

Mentorship

- 2019 Faculty working group for strategizing campus-wide improvements in mentorship and advising, Malone University, Canton, OH.
- 2019 Faculty advisor, Catholic Life Spiritual Formation Group, Malone University, Canton, OH.
I also provide open-door mentorship for all the Catholic students we have at Malone.
- 2018-2019 Developed and co-led “Becoming a Professional in the Natural Sciences Workshop” to instruct undergraduate students in pursuing internships, gaining research experience, building resumes, constructing cover letters, and preparing for careers in the natural sciences. Malone University, Canton, OH.
- 2018-2019 Met 1-on-1 with ~100 freshman science majors to discuss academic engagement, research opportunities, career planning, and faith development at Malone University, Canton, OH.
- 2017 Voluntary mentorship of undergraduate students at Shaw University, Raleigh, NC.
Provided study skill, research, internship and career advice to students at an HBCU.
- 2012-2016 Mentored 21 undergraduate research students from six academic institutions including University of North Carolina at Chapel Hill, Appalachia State University, UNC Asheville, Elon University, Bates College and North Carolina State University.
- 2012-2014 Provided graduate school mentorship and instruction to college students without access to graduate programs, Saint Vincent College, Latrobe, PA.

Pedagogical Development

- 2019 15-week faculty Faith and Learning Integration seminar, Malone University, Canton, OH
- 2015 **Fellow**, Future Faculty Fellowship Program, Center for Faculty Excellence, UNC, Chapel Hill, NC.

Publications

- 2020 Brown, A. J. **C. J. Payne**, P. S. White, and R. K. Peet. Shade tolerance and mycorrhizal type may influence sapling susceptibility to conspecific negative density dependence. *Journal of Ecology*, 108(1), pp.325-336.
- Payne, C. J.** Applying month-based growing degree day estimation technique from engineering to long-term ecological data. *Manuscript submitted to Methods in Ecology and Evolution*.
- 2011 **Payne, C. J.** 2011. Bat foraging in riparian zones: responses to stream quality, insect abundance and season. *Proceedings of the National Conference on Undergraduate Research*, 25: 897-905.

Research Experience

- 2011-2018 **Ph.D. Student/Candidate**, University of North Carolina, Chapel Hill, NC.
Resampled long-term Duke Forest permanent sample plots and analyzed 80-years of tree growth data to examine long-term forest dynamics; managed 21 research assistants.
- 2012-13, 2015 **Team Leader**, Carolina Vegetation Survey, University of North Carolina, Chapel Hill, NC .
Led survey teams in the Piedmont and Coastal Plain of NC and SC.
- 2011 Summer **Bioacoustics Assistant**, Carnegie Museum of Natural History, Rector, PA.
Recorded and analyzed audio recordings of migratory birds to aid in the advancement of bioacoustic monitoring techniques and technologies.
- 2011 Summer **Research Volunteer**, State Museum of Pennsylvania and Powdermill Nature Reserve, PA.
Trapped, measured and monitored aquatic turtles, terrestrial turtles and snakes as part of three long-term monitoring studies at the Powdermill Nature Reserve.
- 2010-2011 **Senior Research Thesis**, Saint Vincent College, Latrobe, PA.
Examined riparian bat foraging behavior (via bioacoustics) in response to physical, chemical, and biological habitat degradation.
- 2010 Summer **NSF REU Intern**, University of Alaska Anchorage, Anchorage, AK.
Examined physical and physiological determinants for relative growth of treeline white spruce (*Picea glauca*) to better inform climate change models. Additionally assisted with physiological and microclimate monitoring of ITEX chamber experiments to examine their effectiveness for climate change studies.
- 2008 Summer **LOWA Intern**, Louisiana Waterthrush project, Powdermill Nature Reserve, Rector, PA.
Performed extensive field data collection to assess stream and habitat quality effects on an obligate riparian songbird's breeding biology and foraging ecology in this long-term study.

Awards and Fellowships

- 2019 Summer Scholar's Research Grant, Malone University, \$2500
- 2018 Eugene P. Odum Award for best oral presentation on ecological research, Association of Southeastern Biologists, \$500
- 2015,2017-18 J.T. Callahan Student Award, Ecological Society of America Long-Term Studies Section, \$1200.
- 2012-2017 Alma Holland Beers Scholarship & Summer W.C. Coker Fellowship for botanical research, UNC Chapel Hill, \$18,500.
- 2016 Graduate Student Support Award, Association of Southeastern Biologists, \$400.
- 2015 Dissertation Completion Fellowship, UNC Chapel Hill, \$16,500.
- 2015 Future Faculty Fellowship Program, UNC Center for Faculty Excellence, \$450.
- 2014-2015 Gwendolyn Burton Caldwell Graduate Scholarship in Botany, UNC Chapel Hill, \$430.
- 2012, 2014-15 Great Lakes National Scholarship Program STEM scholarship, \$7,500.
- 2011 Mrs. William C. Coker Fellowship for botanical research, UNC Chapel Hill, \$22,000.
- 2010-2011 A.J. Palumbo Undergraduate Research Endowment grant, Saint Vincent College, \$1,700.

Selected Presentations & Workshops

- 2019 **Payne, C. J.** “Examining long-term ecological change in Southeastern forests.” 3rd annual meeting of the Society of Catholic Scientists, Notre Dame, IN.
- 2018 **Payne, C. J.** “Long-term biomass trends in a North Carolina Piedmont forest.” 103rd Annual Meeting of the Ecological Society of America, New Orleans, LA.
- Payne, C. J.** “MultiEDA: An interactive exploratory data viewer for multivariate plot-based inventory data.” Association of Southeastern Biologists 79th Annual Meeting, Myrtle Beach, SC.
- 2017 **Payne, C. J.** “Intro to Shiny Workshop” Biology Research Symposium, UNC Chapel Hill, NC.
- Payne, C. J.** “Long Term Forest Change in Duke Forest.” 5th Annual Environment and Ecology Research Symposium, UNC Chapel Hill, Chapel Hill, NC.
- 2016 **Payne, C. J.** and R. K. Peet “Analyzing long-term forest dynamics in a North Carolina Piedmont forest using permanent-sample plots.” Association of Southeastern Biologists 77th Annual Meeting, Concord, NC.
- 2015 **Payne, C. J.** and R. K. Peet. “Long-term forest dynamics in the North Carolina Piedmont: a real-time evaluation of forest succession using permanent-sample plots.” 100th Annual Meeting of the Ecological Society of America, Baltimore, MD.
- Payne, C. J.** “Long-term forest growth in a North Carolina Piedmont forest: species specific patterns influencing stand level biomass trends.” Association of Southeastern Biologists 76th Annual Meeting, Chattanooga, TN.
- 2014 **Payne, C. J.** “Long-term forest growth in a North Carolina Piedmont forest: examination of recent growth trends using individual tree growth and mortality data.” Invited Seminar. Saint Vincent College, Latrobe, PA.
- Payne, C. J.** and R. K. Peet. “Long-term forest growth in a North Carolina Piedmont forest: examination of recent growth trends using individual tree growth and mortality data.” Association of Southeastern Biologists 75th Annual Meeting, Spartanburg, SC.
- Payne, C. J.** “Research, Internships, & Grad School.” Invited seminar. Saint Vincent College, Latrobe, PA.
- 2013 **Payne, C. J.** “An Updated Model of Succession.” Duke Forest Annual Research Tour, Durham, NC.
- Payne, C. J.** “Research, Internships, & Grad School.” Saint Vincent College, Latrobe, PA.
- 2012 Coyle, J., K. Palmquist, B. Lopez, F. W. Halliday, K. Becraft, C. Fieseler, C. Hakkenberg, **C. Payne**, K. Peck, D. Tarasi, C. Urbanowicz, C. Mitchell, R. K. Peet and A. H. Hurlbert. 2012. “Inference of ecological properties structuring tree communities in eastern North America using functional and phylogenetic diversity.” 97th annual meeting of the Ecological Society of America, Portland, OR.
- Payne, C. J.** “Research, Internships, & Grad School.” Invited seminar. Saint Vincent College, Latrobe, PA.
- 2011 **Payne, C. J.** “Bat foraging in riparian zones: responses to stream quality, insect abundance and season.” 25th National Conference on Undergraduate Research, Ithaca College, Ithaca NY.
- 2010 **Payne, C. J.** “Temperature Relations of White Spruce (*Picea glauca*) in Relation to Treeline.” NSF REU Research Symposium, University of Alaska Anchorage, Anchorage, AK.

Leadership and Professional Service

- 2019 Multiple campus-wide student workshops on student engagement and academic success, Malone University, Canton, OH
- 2019 Faculty working group for strategizing campus-wide improvements in mentorship and advising, Malone University, Canton, OH.
- 2018-2020 Faculty Representative, Tree Campus USA, Malone University, Canton, OH
- 2019-Present Moderator, Biology Stack Exchange online learning community
- 2015-Present Webmaster, Southeast Chapter, Ecological Society of America.
- 2015-2018 Manage work-study students, Plant Ecology Lab, UNC-Chapel Hill, Chapel Hill, NC.
- 2015-2018 Webmaster, Plant Ecology Lab, UNC-Chapel Hill, Chapel Hill, NC.
- 2015-2016 Advisory Committee, Southeast Chapter, Ecological Society of America.
- 2015-2016 By-laws Revision Committee, Southeast Chapter, Ecological Society of America.
- 2015 Member, "Material, Food, & Waste" working group, UNC Strategic Sustainability Plan, UNC-Chapel Hill, Chapel Hill, NC.
- 2015 Reviewer, International Journal of Biodiversity and Conservation.
- 2014-2016 Member and Seminar Host, Curriculum for the Environment and Ecology Graduate Student Seminar Series Committee, UNC-Chapel Hill, Chapel Hill, NC.
- 2014-2015 Volunteer, UNC Office of Waste Reduction and Recycling, UNC-Chapel Hill, Chapel Hill, NC.
- 2014 Recycling Educator, Orange County Solid Waste Management, Orange County, NC.
- 2013-2016 Webmaster & Electronic Outreach, STM Environmental Stewardship, Chapel Hill, NC.
- 2012-2016 Member, St Thomas More Environmental Stewardship Committee, Chapel Hill, NC.
- 2012 Edited Conservation Biology course textbook, UNC-Chapel Hill, Chapel Hill, NC.

Outreach

- 2015-20 Active and top-ranked educator in Biology Stack Exchange online learning community
- 2014-15 Volunteer, Feast of Saint Francis Presentation and Reflection on Climate Change, St. Thomas More Church, Chapel Hill, NC.
- 2013 Presenter, Duke Forest Annual Research Tour, Duke Forest, Durham, NC.
- 2012 Exhibit Organizer/Presenter/educator, UNC Science Expo, UNC-Chapel Hill, Chapel Hill, NC.
- 2012 Volunteer Educator, Nature Research Center, NC Museum of Natural History, Raleigh, NC.
- 2012 Participant, Life as Art event at NC Botanical Garden, showcasing photos of scientific research to the public, Chapel Hill, NC.
- 2009 Environmental Education (bike tours, nature walks, educational hikes, and kids programs), Keystone State Park, Derry, PA.

Professional Affiliations

- 2015-Present Ecological Society of America
2017-Present Society of Catholic Scientists
2017-Present National Association of Biology Teachers
2018-Present Society for the Advancement of Biology Education Research
2012-Present American Association for the Advancement of Science
2014-2018 Association of Southeastern Biologists

Skills

Field & Lab

Floral: Tree & plant ID; Vegetation analysis; Community classification; Plot establishment and resampling; Abundance (cover, frequency, relative measures, basal area, biomass) measurement and analysis; Diversity metrics; Tree measurement (DBH & height) and growth (extension & diameter); Needle density counts; Tree coring; Carolina Vegetation Survey protocol; Moss & lichen growth & leaf moisture sampling in ITEX chambers

Faunal: Ultrasonic bat call recording & analysis; Avian bioacoustics recording & analysis; Mist netting; Banding birds & hatchlings; Weighing & measuring birds; Identifying bird bands; Nest checking; Aquatic and terrestrial turtle trapping; Turtle measurements (dimensions, weight, sex, age); Turtle shell marking; Snake mark-recapture; Snake measurements; Salamander mark-recapture; Insect trapping; Small mammal monitoring

Stream/Aquatic: Stream & lake chemical analyses; Macroinvertebrate collection (D netting and kick netting), identification, storage & analyses; Stream & lake physical analyses (wetted-perimeter stream measurements, stream flow, water depth, turbidity); Fecal coliform analyses; Erosion assessment; EPA habitat assessment

Technical/Other: Terrain analyses; (Micro-)thermocouple construction, installation & reading; Microclimate and solar radiation measurements; Tree temperature; Soil temperature; Soil physical and chemical sampling and analysis; Habitat assessment; Remote sensing and image classification; GIS; Data entry and management
Tools: DBH tape; Graduated height pole, Blume-Leiss altimeter; Clinometer; Hypsometer; Densimeter; Leaf moisture detector; Bioacoustics recorders and software; Mist nests; Banding equipment; Various turtle nets; Insect glue traps; D-nets; Kick nets; Omega thermocouple readers; Soil augur; Metal detector; Compass; GPS

Management and Oversight: Managing large (10+) numbers of field technicians and volunteers; Training large numbers of field technicians and volunteers; Overseeing data entry and management; Data error correction; Equipment inventory and storage; Managing work study students

Computer

Statistical and Mathematical Analysis: R (statistical program); PCORD (multivariate statistical analysis program); IBM SPSS Statistics; Wolfram Mathematica (some)

Audio-Visual Analysis: Adobe Audition; Audacity (audio editor); Raven Interactive Sound Analysis Software; BAT SPECT'R (Spectral analysis, digital Tuning, and Recording) software; BAT SCAN'R (Snapshot Characterization and Analysis) software; ENVI image processing & analysis; ArcGIS

Specialized Analysis: Gap Light analyzer; Populus population simulator software; BLAST Basic Local Alignment Search Tool; Portfolio (multicriteria decision support tool); MAXENT

Data Storage and Management: MS Access; MS Excel

Data Preparation and Presentation: MS PowerPoint; MS Publisher; MS Word; Adobe Photoshop; WordPress

Teaching tools: Biopac Student Lab Animal Physiology and Introductory Human Physiology Teaching System

Analyses

Data Specialties: Working with large data sets; Analyzing long-term temporal vegetation trends; Successional trajectories; Time series analyses; Examining environmental (e.g., soil, climate, and episodic wind disturbance) drivers of vegetation trends; Multivariate analyses

Pattern Determination, Description, and Visualization:

Classification: Hierarchical clustering; Non-hierarchical partitioning; Indicator Species Analyses; Classification and regression tree (CART) analysis; Random Forest; ROC (Receiver operating characteristic) curves; AUC (Area Under the Curve) analyses

Remote Sensing: Image change detection; Supervised and unsupervised image classification

Ordination: PCA (Principle Components Analysis); NMDS (Non-metric Multidimensional Scaling); DCA (Detrended Correspondence Analysis); Weighted Averaging

Trend Analyses:

ANOVA & Regression: Multivariate; LASSO (Least Absolute Shrinkage and Selection Operator)

Other Modeling Techniques: Mixed Effects Modeling; Structural Equation Modeling (SEM); Ensemble Modeling

Spatio-temporal Analyses: Distance matrices; Mantel tests; Semivariograms; Point-pattern analyses; Autoregressive–moving-average (ARMA) models

Other: Survival analyses; Site prioritization; MRPP (Multi-Response Permutation Procedures)