Jeremy D. Forsythe

EDUCATION

Clemson University (Ph.D. student, Forestry & Env. Cons. Jan. 2019-present) Clemson, SC

- **Award**: Phi Kappa Phi Honor Society Membership
- **Coursework**: Applied Data Science & Machine Learning, Statistical Methods, Global Change Ecology, Micrometeorology, Quantitative Ecology, Scientific Writing, Wetland Biology, Ecology of Freshwater Forests, Fire Ecology & Management

University of Kansas (M.A., Ecology & Evolutionary Biology - August 2018) Lawrence, KS

- **Award**: Department of Ecology and Evolutionary Biology Summer Fellowship
- **Coursework**: Biometry, Forest Ecosystems, Simulation Modeling, Plant Ecology, Likelihood Methods, Plant Systematics, Responsible Research & Teaching Effectiveness

University at Albany (B.S. Biological Sciences - December 2013) Albany, NY

- **Award**: Dean's List
- **Coursework**: Theoretical Ecology, Experimental Ecology, Biological Consequences of Climate Change, Geographic Information Systems, Statistical Inference, Evolution, Behavioral Ecology, Cell Biology, Genetics, Grazing in Terrestrial Ecosystems (Graduate Level), Integrated Principles of Ecology (Graduate Level)

Hudson Valley and Broome Community Colleges Troy/Binghamton, NY

- **Award**: Dean's List
- **Coursework**: Field Ecology, Zoology, Animal Behavior, Organic Chemistry, Introductory Science Courses, Multi-Variate Calculus, Differential Eq.

SKILLS

- Acquired substantial skills in eddy covariance & field ecology methods through experience in research & coursework, including flux sensor installation & maintenance, data processing (i.e fluxes, partitioning, & gapfilling), LAI measurements, FIA style forest surveys, plant identification, GIS, and remote sensing (satellite and ground based).
- Strong working knowledge of relevant software: *R, Python, LaTeX, Eddypro, REddyProc, caret & Scikit-learn, neonUtilities, ArcGIS/QGIS, Microsoft Office Windows, & Unix*
- Practical skills developed in and out of academia include excellent public speaking and communication, ability to work as part of a team, leadership, dependable work ethic, time management, a clean driver's license, ability to operate manual transmission vehicles, an above average amount of patience, and an eccentric sense of humor.

TEACHING & OUTREACH

Clemson University

- Mentored through Clemson's UPIC - Professional Internship and Co-Op Program, advising 1-2 undergraduate students each summer through a research program and presentation of an independent project.
- Data Management and Visualization in Natural Resources - Designed and led a guest lecture for a graduate level class teaching techniques on how to organize, manipulate, and visualize biological data in the R programming language.

University of Kansas

- Aided in developing and executing a course redesign for an undergraduate level introductory course for biology majors that emphasized alternative learning strategies such as learning groups, real time response surveys, and integrated on-line tools.
- Mentored through the NSF's REU program, instructing a cohort of 12 students through a 10 week research program that included the design, implementation, and presentation of an independent experiment.

RESEARCH EXPERIENCE

Clemson University Ph.D.

- Dissertation
  - Examining the importance of diffuse radiation enhancement, an effect of the light scattering from clouds and aerosols that often increases photosynthesis by more evenly distributing the incoming solar energy through the forest canopy, on the total photosynthetic uptake of atmospheric carbon by Southern pine ecosystems.
  - Optimizing a new "two-leaf" satellite remote sensing light use efficiency (LUE) model that incorporates diffuse fraction for Southern pines.
  - Using Bayesian statistics in an ecological forecasting framework to make projections of productivity from real-time satellite observations and NOAA weather forecasts.
- Labwork
  - Worked with my lab and collaborators to build a new eddy covariance mesonet for measuring greenhouse gas fluxes in coastal South Carolina, including tower construction, sensor calibration & maintenance, and data workflow from raw measurements through a final partitioned & gapfilled product (i.e. QA/QC, developing machine learning algorithms, and an Ameriflux submission pipeline).

University of Kansas Master's Degree

- Joined a long term community analysis project exploring forest succession in an ecotone between eastern deciduous forests and tall-grass prairies.
- Acquired a new familiarity with field techniques useful for long term plant ecological studies while personally contributing a quantitative approach and spatial component to the ongoing research.
- Adapted a novel statistical methodology for interpreting the underlying distribution of diameters for tree populations using maximum likelihood.

University of Kansas REU : Research Experience for Undergraduates

- Summer 10 Week National Science Foundation funded program.
- Developed an independent research project exploring the interactive effects of management practices (fertilization, haying, and native seed addition) on the restoration of native tall grass prairie across increasing spatial scales from community to landscape.

University at Albany

- Developed an independent research project investigating invasive plant species and planning a management strategy utilizing ungulate grazing as a biological control.

REFERENCES

- Dr. Tom O'Halloran: Ph.D. Advisor, Research Scientist, and Clemson Faculty. tohallo@clemson.edu (843) 546-1013
- Dr. Bryan Foster: Master's Advisor, REU Mentor, and University of Kansas Faculty. bfoster@ku.edu (785) 864-4361
- Dr. Mark Mort: Mentor, Teaching Advisor, and University of Kansas Faculty. memort@ku.edu (785) 864-5706

PUBLICATIONS

- Williams, T.M., B. Williams, B. Song, T.L. O'Halloran, J.D. Forsythe. 2022. Mapping natural forest stands with low-cost drones. Mathematical and Computational Forestry & Natural-Resource Sciences: Vol. 14: Iss.1, pp 22-42.
- Ahlswede, B. J., O'Halloran, T. L., Forsythe, J. D., & Thomas, R. Q. 2021. A minimally managed switchgrass ecosystem in a humid subtropical climate is a source of carbon to the atmosphere. GCB Bioenergy, 14, 24– 36.
- Forsythe, J. D., O'Halloran, T.L. and M. A. Kline. 2020. An eddy covariance mesonet for measuring greenhouse gas fluxes in coastal South Carolina. Data 5:1–20.

PRESENTATIONS

- **Invited Talk:** Carbon Management & Clearcut Recovery in Longleaf Pine Ecosystems. J.D. Forsythe, O'Halloran, T.L. Jones Center at Ichauway. Newton, GA. April 11, 2022.
- **Invited Talk:** Managing land to sequester carbon and greenhouse gases. O'Halloran, T.L., J.D. Forsythe, L. Clay. SC Soil and Water Conservation Society. Charleston, SC. February 21, 2022.
- **Invited Talk:** Carbon and climate benefits of longleaf pine forests. O'Halloran, T.L., C. DeGarady, M. Motallebi, B.S. Song., L. Clay, J.D. Forsythe. SC Native Plant Society, Lowcountry Chapter (virtual). February 15, 2022.
- **Poster:** Marshes Migrating Into Forests: Effects of Sea Level Rise on Coastal Ecosystems. Balkcum O, Song B, Forsythe J D, Wise M, Kline M A, O'Halloran T L. Clemson University Baruch Institute of Coastal Ecology and Forest Science Behind the Gate; Georgetown SC, 2021 July.
- **Poster:** How Does Fire Alter Carbon Stocks and Plant Diversity in a Longleaf Pine Understory? Wise M., Forsythe J.D., Song B., Balkcum O., Kline M.A., O'Halloran T.L. Clemson University Baruch Institute of Coastal Ecology and Forest Science Behind the Gate; Georgetown SC, 2021 July.
- **Poster:** Role of Phenology in Switchgrass Carbon Fluxes. Kuleba A, O'Halloran T L, Rady J, Powell L, Forsythe J D. Clemson University Baruch Institute of Coastal Ecology and Forest Science Behind the Gate; Georgetown SC, 2021 July.
- **Poster:** Comparing Carbon Dioxide and Methane Fluxes between a Natural Salt Marsh and Managed Wetlands. Clay, L., Forsythe, J.D., and O'Halloran, T.L. Behind the Gate. Baruch Institute for Coastal Ecology and Forest Science, 2021 July.
- **Poster:** Forsythe J. D., O'Halloran T L, Williams T, Kaminski R, Kline M A. An Eddy Covariance Mesonet Measuring Coastal Carbon Fluxes in South Carolina. 7th North American Carbon Program OSM; 2021 March.
- **Poster:** Forsythe, J. D., O'Halloran, T.L. and M. A. Kline. Establishing An Eddy Covariance Mesonet in Coastal South Carolina Ameriflux; 2020
- **Poster:** Forsythe J. D., Foster, BL. The Effects Of Disturbance And Soil Nutrient Enrichment On Grassland Community Biodiversity Across Spatial Scales. KU Madison & Lila Self Graduate Fellowship Symposium