Sean A. Bloszies

606 Sunset Dr.
Burnsville, NC 28714 – (706) 580-3860

EDUCATION

PhD, Soil Science
North Carolina State University — Dec 2016
Specializing in nitrogen mineralization and mineral nitrogen

BSA, Horticulture — May 2008
University of Georgia

SCIENCE and NATURAL RESOURCE EXPERIENCE

Forestry Technician
Woodsmen Forestry, Spruce Pine, NC — 04/07/2025—Present

- Used DEMs and GIS for map preparation and performed statistically sound forestland inventories, timber value appraisals, timber sale preparation, and boundary line marking
- Prepared forest management plans, weekly volume reports for clients, mailings for marketing
- Met with logging contractors on active timber harvest sites

Technical Assistance Provider
Carolina Farm Stewardship Association's Helene Recovery Assistance Initiative — 01/03/2025—Present

- Interviewed farmers during document and understand the extent of damage from the hurricane
- Connected farmers with public and private assistance resources such as USDA NRCS and FSA programs

Field and Lab Research Manager
Forest Productivity Cooperative (FPC) at North Carolina State University — Aug 2022—Feb 2025

- Led the research initiatives for Variable Rate drone fertilizer and herbicide application, including defining plans for research in this area in a $450,000 grant application submitted to USDA's 2024 AFRI Foundational and Applied Science Program, building on FPC's LiDAR and photogrammetry experience
- Conducted extensive timber plantation pine and research plot surveys to do such things as prepare reports, collect growth data, calculate plot areas, create maps and fertilizer plans.
- Optimized field and lab processes such as soil testing via microdialysis and data collection improvement initiatives via the use of mobile GIS apps
- Worked with fellow university personell at Virginia Tech and UDEC (Chile), industry such as Weyerhaeuser and WSP, and research institutions like Funga PBC to advance technical knowledge and secure letters of support for grant applications
- Documented research findings from the Variable Rate fertilizer application trials
- Prepared the FPC's Two Page reports for Coop member companies and organizations
- Contribute to technical publications e.g. by performing the data curation and merging of 100's of thousands of forest management operations on one million hectares of industrial farmland for the "Nature vs. Nurture" Forest Ecology and Management paper (Ribas-Costa et al., 2024)

- Contributed to intellectual property development by ground-truthing forest growth metrics within soil codes as classified by the FPC's SPOT v3.1 geodatabase (Site Productivity Optimization for Trees)
- Supported junior researchers and mid-level scientists such as grad students, post-docs, and undergraduates by sharing expertise and fostering technical skill development within the FPC team
- Utilized Microsoft Office, Outlook, Teams, and Excel; ArcGIS Pro, Field Maps and Survey123 for data collection; Virtual Studio Code for Python; Rstudio for R, JSON and HTML; and Cloud Compare for LiDAR manipulation
- Utilized a ground LiDAR scanner, several base-and-rover and network rover RTK surveying equipment (Eos, Topcon, Carlson) and a total station to collect boundaries and points
- Hired and supervised from 3 to 7 people to safely and efficiently accomplish field surveys of tree locations and growth as well as lab and computer work
- Demonstrated a strong safety mindset and maintained a safe and healthy work environment by being the FPC's point person responsible for maintaining the lab's Safety Plan, MSDS, chemical inventory, herbicide application processes, student worker safety certifications, and APHIS compliance
- Worked independently to conduct administrative, HR, GIS, data analysis, presentation preparation, and budgeting tasks
- Continued duties of previous Postdoctoral Research Scholar role

Postdoctoral Research Scholar
Forest Productivity Cooperative at North Carolina State University Mar 2022—Aug 2022

- Managed team of up to six graduate and undergraduate employees to conduct field and lab-based research
- Conducted lab maintenance and safety plan implementation, including submitting a facilities modification, training of all Forest Productivity Cooperative lab users, and conducting a lab inventory
- Analyzed and wrote up plot-scale productivity data for a poster at the annual meeting
- Led logistics of both the 2022 FPC Annual Meeting and Contact Meeting, including arranging AV requirements, food, scheduling, and transportation
- Made extensive material purchases and tracked detailed expenses via P-card and Marketplace as well as payroll expenditures
- Applying for and receiving permits and certifications including a USDA permit to receive soil internationally, FAA Small UAS Certificate of Registration for two FPC drones, new vehicle titling and registration, and certified calibration of lab equipment

Postdoctoral Research Scholar
North Carolina State University, Hu Soil Ecology Lab Nov 2019—Mar 2021

- Conducted laboratory research to assess quantities copies of the nosZ, nirK, nirS nitrogen cycling genes in field soil via qPCR
- Developed and organized state-wide soil sampling protocol to collect data from row crop farms across North Carolina.
- Became intimately familiar with conceptual flowsheets for gaseous nitrogen losses and mineral nitrogen recovery from soil

- Arranged sampling activities and performed field soil sampling at twelve farms in ten North Carolina Counties
- Analyzed soil samples in NCSU Soil Ecology Laboratory for a suite of biological, chemical, and physical properties including N_2O, CO_2, MBN, MBC, PMN, NO_3^-+NH_4^+-N, *nos*Z, *nir*K, *nir*S, WHC, H_2O, and $pHCaCl_2$
- Published a first author publication that interpreted results of a designed study of several tractor implements' impacts on soil biological and physical properties
- Performed principle components analysis, a kind of multivariable (multivariate statistics) data analysis to determine soil property drivers of N_2O production

Project Manager
Soil Health Institute Jan 2017—Oct 2019
Project 1: Soil health relationships with water quality in the Mississippi river basin
- Conducted soil sampling and statistical data analysis and oversaw all lab testing of a pilot-scale project to evaluate the links between soil health, water quality and conservation practices in advance of the North American Project to Evaluate Soil Health Measurements (NAPESHM)
- Managed budget and all project elements for a $500,000 project over 18 months
- Performed process simulations to assess leaching of mineral nitrogen from fields under different management practices via the Root Zone Water Quality Model 2, an executable software model

Project 2: Soil health promoting practices and yield consistency: A systematic evaluation
- Worked with a NCSU Statistics Department head Dennis Boos to develop a novel way to quantify crop yield variance
- Used advanced statistical tools to perform a meta-analysis of farming practices' impacts on crop yield variability and stability

Graduate Research Assistant
North Carolina State University, Hu Soil Ecology Lab Jul 2011—Dec 2016
- Designed experimental methodologies to assess aggregate stability, soil hot water extractable carbohydrates
- Investigated improvements to mineral nitrogen recovery from soil organic matter via a factorial experiment manipulating levels of mineral nitrogen fertilizer and mycorrhizal fungae access
- Submitted National Science Foundation grant proposal to study the impact of *Microstegium vimineum* on soil properties
- Supervised three student workers in the lab and field
- Used gravity separation to measure different densities of particulate organic matter in soils.
- Researched the effect of soil nitrogen on mycorrhizal stimulation of organic matter turnover in greenhouse, turfgrass, and field corn experiment
- Collected data on crop biomass, tissue N content, and root length colonization
- Researched the impact of reduced tillage and cover crops on trace gas emissions (N_2O, CH_4) and soil organic matter turnover in row crop and hay rotation system
- Researched the effect of legume cover crop species and termination practices on soil organic matter dynamics in a field corn experiment
- Researched the beneficial endophytic bacteria B. phytofirmans PsJN in bioenergy switchgrass and associated soil organic matter dynamics

Research Interviewer
North Carolina State University, Department of Sociology and Anthropology June 2015—Apr 2016

- Conducted in-person semi-structured interviews with farmers across North Carolina
- Reported barriers and advantages to adoption of conservation and organic practices

PUBLICATIONS

1. Ribas-Costa, V.A., A. Gastón, **S.A. Bloszies,** J.D. Henderson, A. Trlica, et al. 2024. Nature vs. nurture: Drivers of site productivity in loblolly pine (Pinus taeda L.) forests in the southeastern US. Forest Ecology and Management 572: 122334. https://doi.org/10.1016/j.foreco.2024.122334
2. **Bloszies**, **S.A**., Reberg-Horton, S.C., Heitman, J.L., Woodley, A.L., Grossman, J.M., Hu, S., 2022. Legume cover crop type and termination method effects on labile soil carbon and nitrogen and aggregation. Agron. J. 114, 1817–1832. https://doi.org/10.1002/agj2.21022
3. Huang, S., Lv, W., **Bloszies, S.**, Shi, Q., Pan, X., Zeng, Y., 2016. Effects of fertilizer management practices on yield-scaled ammonia emissions from croplands in China: A meta-analysis. Field Crops Res. 192, 118–125. https://doi.org/0.1016/j.fcr.2016.04.023
4. Xing, S., Wang, J., Zhou, Y., **Bloszies, S.**, Tu, C., Hu, S., 2015. Effects of Nh4+- N/No3--N Ratios on Photosynthetic Characteristics, Dry Matter Yield and Nitrate Concentration of Spinach. Exp. Agric. 51, 151–160. https://doi.org/10.1017/S0014479714000192
5. Gong, B., Wen, D., **Bloszies**, **S**., Li, X., Wei, M., Yang, F., Shi, Q., Wang, X., 2014. Comparative effects of NaCl and $NaHCO_3$ stresses on respiratory metabolism, antioxidant system, nutritional status, and organic acid metabolism in tomato roots. Acta Physiol. Plant. 36, 2167–2181. https://doi.org/10.1007/s11738-014-1593-x
6. Gong, B., Li, X., **Bloszies**, **S**., Wen, D., Sun, S., Wei, M., Li, Y., Yang, F., Shi, Q., Wang, X., 2014. Sodic alkaline stress mitigation by interaction of nitric oxide and polyamines involves antioxidants and physiological strategies in Solanum lycopersicum. Free Radic. Biol. Med. 71, 36–48. https://doi.org/10.1016/j.freeradbiomed.2014.02.018
7. Gong, B., **Bloszies, S.**, Li, X., Wei, M., Yang, F., Shi, Q., Wang, X., 2013. Efficacy of garlic straw application against root-knot nematodes on tomato. Sci. Hortic. 161, 49–57. https://doi.org/10.1016/j.scienta.2013.06.027

ACADEMIC PRESENTATIONS

1. **Bloszies**, S.B., Albaugh, T.J., Cook, R.L, Trlica, A. Variable Rate CAFS trial growth response. Also: Where are my trees? Using Sub-cm GNSS to locate features for use in inventory. 2024 Joint Tree Improvement Program-Forest Productivity Cooperative Contact Meeting, Amelia Island, FL. Oral Presentation. November 2024
2. Chandler, C., Cook, R.L, Trlica, A., **Bloszies**, S.B., How fertilizer rate and timing and soil microbiome interact to affect growth of Loblolly Pine (*Pinus taeda*). 2022 Forest Productivity Cooperative Annual Meeting, Raleigh, NC. Poster Presentation. August 2022
3. **Bloszies**, S.A., Morgan, C., Honeycutt, C.W. Soil properties and edge of field nutrient losses in paired field experiments in the Mississippi River Basin. 2018 Annual meeting of the Soil Health Institute, Sacramento, CA. Poster Presentation. July 2019

4. **Bloszies**, S.A., Shafer, S., Honeycutt, C.W. A Meta-Analysis Evaluating Relationships between Soil Health Promoting Practices and Yield Resilience. 2018 Annual meeting of the American Society of Agronomy, Minneapolis, MN. Oral Presentation. Nov 2018
5. **Bloszies**, S.A., C. Reberg-Horton, S. Hu. Effects of Alternative Farming Systems on Soil Organic Matter Pools and Nitrous Oxide Emissions. 2016 Annual meeting of the American Society of Agronomy, Phoenix, AZ. Oral Presentation. Nov 2016
6. **Bloszies**, S.A., P. Ginakes, S. Hu. Soil Conservation and Greenhouse Gas Emissions: The Role of Reduced Tillage and Organic Agriculture in Soil Nitrous Oxide Production. 2015 Annual meeting of Soil and Water Conservation Society, Greensboro, NC. Oral Presentation. Jul 2015
7. **Bloszies**, S.A., J.M. Grossman, J.L. Heitman, S. Hu. Effect of Legume Cover Crops and Spring Termination Practices on Soil Organic Matter and Aggregate Stability. 2014 Annual meeting of the American Society of Agronomy, Long Beach, CA. Oral Presentation. Nov 2014
8. **Bloszies**, S.A., J.M. Grossman, J.L. Heitman, S.C. Reberg-Horton, S. Hu. Managing for soil organic matter in low input agroecosystems with cover crops and reduced tillage. 2013 Annual meeting of the Ecological Society of America, Minneapolis, MN. Poster Presentation Jul 2013
9. **Bloszies**, S.A., J.M. Grossman, J.L. Heitman, S.C. Reberg-Horton, S. Hu. Managing for soil carbon in organic agroecosystems with cover crops and reduced tillage. 2012 Annual meeting of the Soil Science Society of North Carolina, Raleigh, NC. Poster Presentation

TEACHING EXPERIENCE

Teaching Assistant
North Carolina State University, Department of Entomology and Plant Pathology
PP318: Forest Pathology — Spring 2013
PP502: Plant Disease Methods and Diagnosis — Fall 2014

- Prepared lab for undergraduate (PP318) and graduate student (PP502) courses
- Instructed students on course material and experimental techniques including pathogen identification via microscopy, culture-based assays, and molecular tools

Guest Lecturer
FOR 491: Forest Soils — Spring 2023
Soil Health: What it means in a forest soil context
SSC 461: Soil Physical Properties and Plant Growth — Fall 2013 and 2014
Thinking locally, engaging globally: Management impacts on soil structure in tropical soils
SSC 427: Biological Approaches to Sustainable Soil Systems — Fall 2013
Effects of management and soil microbes on aggregate stability and soil structure
NC Resource Conservation Workshop — Summer 2013
Serial dilution and plating hands-on lab demonstration

NC Master Gardener Workshop Leader
Understanding soil health — Summer 2014

INTERNATIONAL EXPERIENCE

NC State University study abroad for PhD student-professor cohorts to Costa Rica

Teaching Locally, Engaging Globally Nov 2012

- Interviewed personell at universities, farms, and facilities throughout Costa Rica
- Obtained materials to incorporate into course materials for US undergraduate university classes

Graduate Student Research Exchange in China May 2013

- Presented research at four symposia at universities in Nanjing, Beijing, Shanghai, and Kunming featuring NCSU and Chinese graduate students

TECHNICAL EXPERTISE & TRAINING

- Licensed North Carolina Ground Pesticide Applicator with Forest and Demo and Research subcategories
- Python, R, and SAS programming languages
- PC software including JMP, QGIS, ArcGIS Pro, Access, Excel, Word, PowerPoint and Root Zone Water Quality Model 2
- 2015 Research Triangle Communicating Science Workshop
- Interviewing for qualitative research
- Design of field and lab experiments
- Fluent in English. Basic Spanish

AWARDS

- American Society of Agronomy travel grant to attend N_2O Workshop 2014
- Second place, Soil Science Society of North Carolina poster competition 2013

ACADEMIC & CIVIC ENGAGEMENT

- Department of Entomology and Plant Pathology (DEPP) Honors and Award committee 2021
- Chair, DEPP Postdoctoral Affairs Committee 2019—2021
- NC Soil & Water Conservation District education exhibit at State Fair 2014—2015
- Volunteer at NC Future Farmers of America Convention 2014—2015
- Agroecology Education Farm volunteer 2011—2015
- President, Soil and Water Conservation Society at NCSU 2013, 2015
- Vice President, Sustainable Agriculture Graduate Student Association 2014
- University Graduate Student Association rep and newsletter editor 2014
- Graduate student Library Representative, Plant Pathology Department 2014