

Andrea Ludwig

ASSOCIATE PROFESSOR OF ECOLOGICAL ENGINEERING

DEPARTMENT OF BIOSYSTEMS ENGINEERING AND SOIL SCIENCE, UNIVERSITY OF TENNESSEE

Objective

To create a more sustainable society by contributing meaningful educational experiences to land grant university audiences using my expertise in stormwater management, created wetlands, and surface water quality in urban environments and my skills in nature-based design and learner-centered teaching.

Education

2006 - 2010

Virginia Tech
PhD Biological Systems Engineering

Dissertation: "Constructed floodplain wetland effectiveness for stormwater management"

Advisor: W. Cully Hession

Committee: Lee Daniels, Tess Wynn Thompson, Mary Leigh Wolfe

Future Professoriate Graduate Certificate

2004 - 2006

University of Arkansas
MS Environmental Engineering

Thesis: "Periphytic algae nutrient limitation in streams draining the Beaver Reservoir Basin, Northwest Arkansas, USA"

Advisor: Marty D. Matlock

Committee: Brian Haggard, Indrajeet Chaubey, Thomas Soerens

2004 - 2006

University of Arkansas
BS Biological & Agricultural Engineering

Honors and awards

Individual Awards

2022

Award for Extension Faculty, Biosystems Engineering and Soil Science Department

2020

Outstanding Service Faculty Award, Biosystems Engineering and Soil Science Department

2018

J.E. Moss Award for Extension, University of Tennessee Institute of Agriculture

2016

Outstanding Service Faculty Award, Biosystems Engineering and Soil Science

2013

Hicks Award for Outstanding New Extension Worker, UT Extension

2013	Outstanding Service Faculty Award, Biosystems Engineering and Soil Science
2012	Outstanding Service Award, Obed Watershed Community Association

Group Awards

2023	David Gibby Search for Excellence Award, International Extension Master Gardener Competition, awarded to directed Master Gardener program for "Blount County Fire Adapted Communities Demonstration Landscape."
2022	1 st Place Eureka Competition, University of Tennessee, awarded to supervised BSE Senior Design Team for "Design of Engineered Media Amendment Testing Process."
2022	Blue Ribbon Award for Websites, American Society of Agricultural and Biological Engineers, awarded for the Tennessee Smart Yards website https://tnyards.utk.edu .
2021	Orchid Award for Retrofitting Green Spaces, Keep Knoxville Beautiful, awarded to supervised team for "North Hills Library Rain Garden, Knox County."
2020	3 rd Place Gunlogson Competition, American Society of Agricultural and Biological Engineers, awarded to supervised BSE Senior Design Team for "Floating Treatment Wetland Testing and Optimization."

Positions Held

2016 – Present	<p>Associate Professor Department of Biosystems Engineering and Soil Science, University of Tennessee</p> <ul style="list-style-type: none"> • 100% Extension Appointment • Institute of Agriculture
2010 – 2016	<p>Assistant Professor Department of Biosystems Engineering and Soil Science, University of Tennessee</p> <ul style="list-style-type: none"> • 75% Extension / 25% Research Appointment • Institute of Agriculture
2006 – 2010	<p>Graduate Research Assistant, Virginia Tech Funded through the National Fish and Wildlife Foundation for "Effective Strategies for Reducing Nutrient Loads from the Oaqeun Creek Watershed of Virginia and West Virginia." PI: C. Heatwole. Advisor: W. Cully Hession</p> <ul style="list-style-type: none"> • Green stormwater infrastructure design and monitoring • Teaching Assistant for Introduction to Green Engineering
2004 – 2006	<p>Graduate Research/Teaching Assistant, University of Arkansas Funded through the US Environmental Protection Agency "Wadeable Stream Assessment." Advisor: Marty D. Matlock</p> <ul style="list-style-type: none"> • Field methods for stream health and physico-chemical water quality monitoring • Teaching Assistant for Introduction to Ecological Engineering

**Seminal
Extension
Programs and
Formal
Teaching
Experience**

Tennessee Smart Yards Statewide Program Coordinator

Empowering homeowners to adopt stewardship practices and certify their landscapes to protect Tennessee's water and natural resources. Online platform with supplemental fee-based county programs. Supported by the Sustainable Landscapes Workgroup, UT Extension. <https://tnyards.utk.edu>

- 3,796 hours of education delivered (October 2020 thru August 2023)
- 513 yards certified across 53 counties
- 8 pilot Tennessee Smart Yard Communities
- 16 pilot Certified Tennessee Smart Yard Real Estate Agents
- 3,001 Followers on social media (Facebook)

Backyard STEM for Tennessee 4-H Statewide Co-coordination (with J. DeBruyn)

Educating youth on engineering and environmental science through experiential and inquiry-based learning. <https://backyardstem.tennessee.edu>

- 21 modules developed and delivered through 17 in-service trainings (from 2016 to 2022)
- Developed and deliver the annual Tennessee Invasive Species Youth Poster Contest

Spring 2023

Advanced Ecological Engineering Applications BSE 562, Biosystems Engineering and Soil Science, University of Tennessee

Couse development and instruction.

- Graduate-level class
- Includes seven field trips

2010 – 2023

Guest Lectures and Field Experience Support

University of Tennessee

- ESS220 Waters and Civilizations (Cultures & Civs). Spring 2016. Credit Hours: 3. Enrollment: 250
 - BSE401 Biosystems Engineering Design I. Fall 2016. Credit Hours: 3. Enrollment: 12
 - WFS340 Wetlands Ecology and Management. Fall 2016. Credit Hours: 2. Enrollment: 30
 - GEO600-CLEM Field Experience for Geology Students. Summer 2017. Credit Hours: 12. Enrollment: 40
 - CEE500 Graduate Seminar. Fall 2017. Credit Hours: 2. Enrollment: 6
 - WFS340 Wetlands Ecology and Management. Fall 2017. Credit Hours: 5. Enrollment: 32
 - WFS340 Wetlands Ecology and Management. Fall 2018. Credit Hours: 3. Enrollment: 33
 - USEPA Campus Rainworks Challenge Special Topics. Fall 2018. Credit Hours: 4. Enrollment: 14
 - 331 FWF Fall Field Camp. Fall 2019. Credit Hours: 2. Enrollment: 30
-

Guest Lectures and Field Experience Support (continued)

- 415 Landscape Architecture. Fall 2019. Credit Hours: 2. Enrollment: 6
- BSE400 Senior Design 1. Fall 2019. Credit Hours: 2. Enrollment: 12
- BSE400 Senior Design 1. Spring 2020. Credit Hours: 3. Enrollment: 4
- WFS340 Wetlands Ecology and Management. Fall 2020. Credit Hours: 2. Enrollment: 60
- LAR415 Landscape Architecture. Spring 2021. Credit Hours: 3. Enrollment: 12
- FWF315 Principles of Wildlife and Fisheries Management. Fall 2021. Credit Hours: 3. Enrollment: 18
- BSE400 Senior Design 1. Spring 2022. Credit Hours: 3. Enrollment: 4
- FWF315 Principles of Wildlife and Fisheries Management. Fall 2022. Credit Hours: 6. Enrollment: 45
- GEOL455 Urban Ecology. Fall 2022. Credit Hours: 4. Enrollment: 50
- FWF Forestry. Fall 2022. Credit Hours: 3. Enrollment: 17
- FWF Fall Camp. Fall 2015. Credit Hours: 3. Enrollment: 35
- ESS220 Soils and Sieves. Spring 2015. Credit Hours: 3. Enrollment: 120
- BSE Hydrology. Spring 2015. Credit Hours: 3. Enrollment: 16
- FWF Wildlife. Spring 2015. Credit Hours: 3. Enrollment: 17
- GEOL Restoration Ecology. Fall 2015. Credit Hours: 3. Enrollment: 50
- BSE Practicum. Fall 2015. Credit Hours: 3. Enrollment: 15
- BSE444 Senior Practicum. Fall 2014. Credit Hours 3. Enrollment: 24
- FWF493 Wetland Wildlife Ecology. Spring 2014. Credit Hours: 3. Enrollment: 16
- FWF493 Wetland Wildlife Ecology. Fall 2013. Credit Hours: 3. Enrollment: 25
- GEOL Restoration Ecology. Fall 2013. Credit Hours: 3. Enrollment: 30
- FWF493 Wetland Wildlife Ecology. Fall 2012. Credit Hours: 3. Enrollment: 20
- BSE Environmental Sampling and Monitoring. Credit Hours: 3. Enrollment: 15
- ESS Soils and Sieves. Spring 2012. Credit Hours: 3. Enrollment: 20.
- FWF Wetland Ecology. Fall 2011. Credit Hours: 3. Enrollment: 20

Grants and Contracts

1. Ludwig, A., Q. Cypher (Sept 2023 – Dec 2024) Gibbs Rutan Park Tree Planting and Green Infrastructure. Tennessee Valley Authority. \$7,835.
2. Ludwig, A. (Sept 2023 – Sept 2024) Tennessee Smart Yards. Tennessee Valley Authority. \$1,000.
3. Jean-Philippe, S., A. Ludwig, J. Hathaway, J. Richards (Sept 2023 – Sept 2025) Tennessee Community Riparian Restoration Program. TN Dept of Forestry. \$99,600.
4. Ludwig, A., S. Jean-Philippe, J. Hathaway, J. Richards (Dec 2023 – Jan 2026) Implementing a Watershed Prioritization tool for Riparian Restoration. TN Dept of Environment and Conservation. \$195,500.
5. Ludwig, A., N. Bumgarner, L. Duncan (Aug 2023 – 2025) Technology Transfer of Nutrient Management and Water Quality Protection for Urban and Community Farmers. National Association of State Departments of Agriculture. \$189,072.
6. Ludwig, A., Q. Cypher, T. Gangaware, G. Ferry (May 2023 – 2024) Creekbank Repair with Educational Workshops in Knox County. Tennessee River Basin Network. \$5,830.
7. Jean-Philippe, S. A. Ludwig, J. Hathaway, J. Richards (May 2021 – 2023) Community Riparian Restoration Program for Tennessee. TN Dept of Forestry. \$48,029.
8. Ludwig, A., M. Campanis, K. Hoyt (Feb 2017 – Present) Rain Garden and Native Meadow Demonstration at the UT Arboretum Auditorium. Private Donor. \$15,000.
9. Hathaway, J., A. Ludwig, J. Schwartz, F. Walker (Oct 2019 – 2023) Restoring Floodplain Wetland and Hydrologic Connectivity Using Regenerative Stormwater Conveyance. US Environmental Protection Agency. \$85,500.
10. McKinney, M., A. Ludwig, G. Ferry, M. Ross, J. Schwartz (Apr 2022 – 2023) Living Shorelines. One Health Initiative Seed Grant. University of Tennessee. \$40,000.
11. Walker, F., S. Hawkins, A. Ludwig (Sept 2019 – 2023) Bat Creek Restoration Project. Tennessee Department of Agriculture Nonpoint Source Program. \$210,000. Co-PI (Walker Lead).
12. Ludwig, A., A. Hopkins (transferred from T. Prather, W. Bruhin, J. Donaldson) (Aug 2019 – 2022) Disaster Preparedness and Firewise Landscaping for Sevier, Blount, and Cocke Counties. National Institute for Food and Agriculture, USDA. \$88,384.
13. Burns, R., B. West, A. Ludwig, J. Buchanan (Feb 2020 – 2022) Feasibility for the West Tennessee Water Education & Training (WET) Center. TN Dept of Environment and Conservation. \$30,000.
14. Duncan, L., A. Ludwig (Oct 2019 – 2020) Potential for Constructed Wetlands in Agriculture in West TN. Cotton, Inc. \$9,676.
15. Ludwig, A., D. Gregg (Jan 2018 – 2021) Getting the Job Done Right: Contractor Training for Small-Scale Water Quality Protection Solutions. TN Dept of Ag 319 Program. \$66,656.
16. Ludwig, A., M. Ross (2020 – 2023) Rain Gardens for Campus Communities. UT Green Fees Award. \$15,000.
17. Ludwig, A., J. Hathaway, L. Mason (May 2018 – 2019) Growing Green and Sustainable Communities with Rain Gardens. UT Women's Alliance for Philanthropy; UT Office of Research & Engagement. \$8,000.
18. Ludwig, A. (Sept 2017 – 2019) Instrumenting an Outdoor Laboratory at the UT Gardens Constructed Wetlands. Institute for a Secure and Sustainable Environment. \$35,600.
19. Ludwig, A. (Nov 2016 – 2017) Urban Trees for Schools. Tennessee Wildlife Resources Agency. \$500.
20. Ludwig, A., N. Bumgarner, C. Scott (May 2016 – 2017) Sustainable Residential Landscapes Workgroup Funding. UT Extension. \$18,900.
21. Ludwig, A., M. Essington, F. Walter, P. Ayers. Sept 2015 – 2019. Dam Sediment Recycling: Developing Protocols for Characterization and

- Standards for Reuse in Wetland Rehabilitation. United States Environmental Protection Agency, Wetland Development Grant Program, \$200,000.
22. Duncan, L., J. Logan, B. Ownley, F. Critzer, J. Edwards, L. Muller, S. Jean-Philippe, A. Ludwig, K. Gwinn, J. DeBruyn, D. Hadziabdic-Guerry (May 2015 – 2016) Fostering aGIRLculture. National Institute for Food and Agriculture, US Department of Agriculture. \$53,000.
 23. Ludwig, A., D. Yoder J. Buchanan J. Tyner (2014) Enhancing widespread water quantity and quality control through implementation and dissemination of the Tennessee Runoff Reduction Assessment Tool (RRAT) to assist in the design and evaluation of runoff reduction Low Impact Development (LID) practices. Tennessee Department of Environment and Conservation, \$90,000.
 24. Lee, J., A. Ludwig, J. DeBruyn, S. Hawkins, F. Walker, J. Buchanan (2014) Underground reactive barrier to attenuate contaminants from agricultural drainage. University of Tennessee – Knoxville – TN Water Resources Research Center, \$10,000.
 25. Ludwig, A., B. Collett, S. Hamilton (2013) Making Orange Green: Towards a Water-Smart Campus at UT; Tennessee Stormwater Association, \$21,900.
 26. Yoder, D., A. Ludwig, J. Buchanan, J. Tyner (2013) Tennessee Stormwater Management Assistance Research and Training (SMART) Center. Tennessee Wildlife Resources Agency, \$20,000.
 27. Walker, F., A. Ludwig, J. DeBruyn, M. Essington, S. Hawkins, C. Clark, D. Lambert (2012) Watershed Scale Project in Oostanaula Creek. USDA National Institute for Food and Agriculture, National Integrated Water Quality Project, \$633,400.
 28. Ludwig, A., R. Hanahan (2012) Tennessee Yards and Neighborhoods: Establishing Roots for Long-Term Viability. Tennessee Department of Agriculture (319 Non-point source funds), \$50,000.
 29. Ludwig, A. (2012) Eco-Morphological Stream Design and Assessment Tools for the Alabama and Tennessee Appalachian Plateau., Wetland Program Development Grant, US Environmental Protection Agency \$61,000. Subcontract (Auburn University Lead).
 30. Ludwig, A., D. Hodges (2012) Evaluation of Bioretention Practices for Effective Stormwater Management and Treatment: A Laboratory to Field Study; US Geological Survey through the TN Water Resources Research Center, \$49,280.
 31. McKay, L., A. Ludwig (2012) Assessing impact of UT dairy operations and BMPs on microbial water quality in streams and Assessing impact of UT dairy operations and BMPs on microbial water quality in streams and wetlands using a mass balance approach with monitoring of E. coli, host-specific Bacteroidetes and bovine virus. University of Tennessee M-CERV, \$5,000.
 32. Gangaware, T., A. Ludwig, J. Buchanan, J. Tyner, D. Yoder (2012) Tennessee Permanent Stormwater Management Handbook. Tennessee Department of Environment and Conservation, \$200,000. (Co-Lead UTK-TN Water Resources Research Center).
 33. Ludwig, A., J. Schwartz, F. Walker, S. Hawkins (2011) Effective Streambank Stabilization Practices in Oostanaula Creek. Tennessee Department of Agriculture (319 Non-point source funds), \$185,000.
 34. Ludwig, A., D. Yoder (2011) Evaluation of Bioretention Practices for Effective Stormwater Management and Treatment: A Laboratory to Field Study. US Geological Survey through the TN Water Resources Research Center, \$37,517.
 35. Ludwig, A., J. Buchanan (2011) Watershed Academy; USDA Southern Regional Water Quality Program, \$28,000. Lead PI (Auburn University Lead).
 36. Hanahan, R., A. Ludwig (2011) Low Impact Development Demonstrations on the UTIA campus. UT Green Fees Program, \$2,500.

37. D. Yoder, J. Buchanan, T. Gangaware, A. Ludwig, J. Tyner (2011) TN Stormwater Management Assistance Research and Training Center; TN Department of Environment and Conservation Seed Grant, \$150,000.
38. Yoder, D., J. Buchanan, J. Tyner, A. Ludwig (2010) TN Stormwater Management Assistance Research and Training Center. UTIA Innovation Grant, \$35,000.
39. Ludwig, A., F. Walker, L. McKay, S. Hawkins, J. Lee (2010) Water Quality Best Management Practices at the Little River Animal and Environmental Unit. UTIA Innovation Grant, \$25,000.

Publications

Refereed Journal and Electronic Publications

1. Essington, M.E., A. Ludwig, E.A. Essington, F.R. Walker (2022) Persistence of organochlorine pesticide residues in sediments derived from an agricultural watershed in Tennessee, USA. *Journal of Soils and Sediments* 22 (6), 1852-1864.
2. Ludwig, A., C. Graves, G. Ferry, J. Newburn (2020) Ecological Design Bolsters Community Acceptance of Constructed Wetlands at the University of Tennessee Gardens. *Environmental Connection: The Official Publication of the International Erosion Control Association* 14 (4) 14-16.
3. Yoder, D.C., J.S. Tyner, A. Ludwig, J.R. Buchanan, T.R. Gangaware (2019) Lessons from developing a stormwater management comprehensive design-review process (2019) *Journal of Soil and Water Conservation* 74 (2), 23A-28A.
4. Connell, B., P. Ayers, A. Ludwig, K. Neff, J. Parham (2019) Georeferenced Video Mapping to Classify Streambank Erosion Susceptibility. *Journal of Spatial Hydrology* 15 (2).
5. Ludwig, A., W.C. Hession, D.T. Scott, D.L. Gallagher (2016) Simulated flood of a small constructed floodplain wetland in Virginia: Event-scale pollutant attenuation. *Transactions of the ASABE* 59 (5), 1319-1329.
6. Ludwig, A. and WC Hession (2015) Groundwater Influence on Water Budget of a Small Constructed Floodplain Wetland in the Ridge and Valley of Virginia, USA. *Journal of Hydrology: Regional Studies*, Vol 4, pp 699-712.
7. Ludwig, A., W. Wright. (2015) Integrated constructed wetlands for treatment of dairy operation runoff in Eastern Tennessee during first year establishment. *Ecological Engineering* Vol 78, pp. 33-40.
8. Ludwig, A. M. Matlock, B. E Haggard, I. Chaubey (2012) Periphyton Nutrient Limitation and Maximum Potential Productivity in the Beaver Lake Basin, United States. *Journal of the American Water Resources Association* Vol 48, Issue 5, pp. 896-908.
9. Ludwig, A. M. Matlock, B. E. Haggard, M. Matlock, E. Cummings (2008) Identification and evaluation of nutrient limitation on periphyton growth in headwater streams in the Pawnee Nation, Oklahoma. *Ecological Engineering* Vol 32, Issue 2, pp 178-186.

Peer-Reviewed Extension Publications National Scope

1. Ludwig, A. 2023. Constructed Wetlands. SERA17 Phosphorus Conservation Practices Fact Sheets. <https://sera17.wordpress.ncsu.edu/constructed-wetlands/>
2. Ludwig, A. 2023. Riparian Buffer Zones. SERA17 Phosphorus Conservation Practices Fact Sheets. <https://sera17.wordpress.ncsu.edu/riparian-buffer-zones/>

Peer-Reviewed Extension Publications University of Tennessee Extension

1. Ludwig, A. (2023) Tennessee Smart Yards W1180
2. Ludwig, A. (2023) Phenology Wheels. Wxxx (In Press)
3. Ludwig, A. (2023) Watershed in a Box. Wxxx (In Press)
4. Johnson, M., A. Ludwig, P. Harr, S. Jean-Philippe (2023) A Guide for the Identification and Management of Invasive Plant Species Common in Riparian Areas of East Tennessee. Wxxx (In Press)
5. Bumgarner, N., B. Ary, A. Duncan, J. Gunter, A. Ludwig, M. Mote, T. Reeder, M. Rose, L. Rumble, C. Scott, J. Stefanski, V. Sykes, H. Treadway, G. Upchurch, W. Whitehouse (2023) Welcome Home: Gardening in Tennessee. PBxxx (In Press)
6. Duncan, L., A. Ludwig, L. Middleton, J. Richards (2023) 4-H Beginner Outcomes: Biosystems Engineering and Environment Sciences (BEES). W1178
7. Ludwig, A., M. Ross, M. Roark, S. Choi (2023) Rain Gardens for Tennessee: A Homeowner's Guide. W 1137
8. Ludwig, A., J. DeBruyn (2022) Making a Mountain Map: What is Topography and How is it Shown on a Flat Map? W 1108
9. Ludwig, A., J. DeBruyn, L. Middleton (2022) 4-H Lesson Plan: Nature Kaleidoscope. W1104
10. Ludwig, A., J. DeBruyn, J. Richards (2022) Rain Garden: Protecting Schoolyard Streams from Stormwater Runoff. W1119
11. Skutnik, M. Fugate, A. Ludwig, J. Richards (2021) Who Is An Engineer and What Do They Do? W 994
12. Ludwig, A., J. Richards, J. Swart (2021) 4-H Project Area Outcomes: Engineering and Safety Science, 1-2 years. W1035-A
13. Ludwig, A., J. Richards, J. Swart (2021) 4-H Project Area Outcomes: Engineering/Safety Science, 3-5 Years. W1035-B
14. Ludwig, A., J. Richards, J. Swart (2021) 4-H Project Area Outcomes: Engineering/Safety Science, 6-9 Years. W 1035-C
15. Ludwig, A. (2021) Educator's Toolkit for Rain Garden Programs. W 908
16. Ludwig, A. (2020) Leveraging Your Landscape: A Guide to Evaluating and Planning for Functional, Enjoyable Outdoor Spaces. W 869
17. Jarvandi, S., J. Toman, A. Ludwig (2019) Promoting Physical Activity at the Workplace. W 806
18. Ludwig, A. (2019) Sustainable Landscaping Planning and Plant Selection W 868
19. J. DeBruyn, S. Wilhelm, A. Ludwig, G. Boyer (2016) Cyanobacteria (Blue-Green Algae) Harmful Algal Blooms. W 340
20. Ludwig, A. (2015) Improving Stream Channels, Ditches and Lakeshores with Live Staking. SP 781-B
21. Ludwig, A., L. Duncan, E. Gall (2015) The World is Flat – At Least with Topographic Maps. W 338-B
22. Ludwig, A., L. Duncan, E. Gall (2015) Tennessee's Natural Resources Crossword Puzzles. W 338-A
23. Duncan, L., A. Ludwig, E. Gall (2015) How Much Water Would a Watershed Shed if a Watershed Could Shed Water. W 338-C
24. Ludwig, A., J. Buchanan (2015) Tennessee Storm-SMART Glossary of Terms for Communities. W301
25. Walker, F., A. Ludwig, L.B. Reynolds, B. McIntosh, S. Hawkins (2014) Agricultural and Urban Best Management Practices for Water Quality. SP 752
26. Ludwig, A., R. A. Hanahan (2013) Rainwater: Your Liquid Asset, A Home Stormwater Exercise. W 300
27. Ludwig, A., J. DeBruyn (2013) Environmental Science: Stormwater Happens! W 292-E
28. Ludwig, A., J. DeBruyn (2013) Environmental Science: Wonderful Wetlands. W 292-F.

Other Publications

1. Ludwig, A. (2023) Landscape Professional Hiring Checklist for a Tennessee Smart Yard. Dxxx (In Press)
2. Ludwig, A. (2023) Native Perennials and Rain Gardens. Tennessee Fire Adapted Communities Guide – A Wildland Fire Safety Guide for Tennessee Residents.
3. Ludwig (2022) Tennessee Smart Yards: Why It Matters, How It Works and Where It Is Taking Hold. D 183
4. Ludwig, A. (2022) "Tennessee Smart Yards." Tennessee Extension Master Gardener Newsletter.
5. M. Reynolds, A. Ludwig (2021) Raindrops Keep Falling on My Head - Rainfall Variation Across the State of Tennessee. D 144
6. Bumgarner, N., A. Ludwig, C. Scott (2021) Retail horticulture education rack card – Tennessee Smart Yards.
7. Ludwig, A. (2020) "Actions We can Take for Greater Sustainability." Land, Life & Science, University of Tennessee Institute of Agriculture.
8. Davis, B., A. L. Ludwig, N. R. Bumgarner, and C. Scott (2020) "Smart Yards." Land, Life, and Science, University of Tennessee Institute of Agriculture.
9. Ludwig, A. L., D. Gregg, and W. E. Klingeman (2019) Water-Sensitive Landscaping: A Growing Opportunity. TN Greentimes.
10. Gregg, D., A. L. Ludwig, and W. E. Klingeman (2019) Controlling weedy perennials, shrubs and trees on slopes and near wetlands. TN Greentimes, 20(4): 14-18.
11. Ludwig, A., D. Yoder, J. Buchanan, J. Tyner, T. Gangaware (2014) Tennessee Permanent Stormwater Management and Design Guidance Manual. Tennessee Department of Environment and Conservation.
12. Tschantz, B and AL Ludwig (2011) Stormwater Management in Tennessee – A SMART Initiative. Tennessee Public Works Magazine.

Papers, Extended Abstracts, and Conference Proceedings

1. Wyatt, B.M., M. Szulczewski, J.M. DeBruyn, A. Ludwig, J Dong (2021) Increasing diversity, equity, and inclusion in the soil and agronomic sciences through K-12 Outreach and Education. ASA, CSSA and SSSA International Annual Meeting.
2. Essington, M.E., E.A. Essington, A. Ludwig, F.R. Walker (2019) Organochloride Pesticide Residues in Sediments Derived from an Agricultural Watershed. ASA, CSSA and SSSA International Annual Meeting.
3. Hadziabdic, D., L. Duncan, N. Bumgarner, F. Critzer, L. Edwards, K. Gwinn, L. Muller, C. Stephens, M. Velandia, C. Buschermohle, J. DeBruyn, E. Gall, J. Logan, A. Ludwig, A. Wszelaki, R.T. Fryxell, H. Kelly, B. Ownley, K. Lewis, D. D'Souza, K. Jones, S. Jean-Philippe, E. Wilcox, M Prado (2017) Fostering aGIRLculture: STEM camp solving the grand challenges of the 21st century. APS Annual Meeting.
4. Bumgarner, N., A. Ludwig, B. Collett, C.E. Stewart (2016) Establishing campus rain gardens that link student experiential learning with stakeholder education and outreach. VI International Conference on Landscape and Urban Horticulture 1189, 537-540.
5. Ludwig, A., S. Hawkins, F. Walker. (2012) "Application and Monitoring of Conservation Practices to Protect Surface Water Quality" Proceedings of the UT Beef and Dairy Field Day, University of Tennessee Institute of Agriculture.
6. Utley, B., A. Ludwig, J.S. Cundiff, and S. McGinnis (2008) Organization of an Introductory Green Engineering Course for Engineering Undergraduates. 2008 Annual Conference and Exposition Proceedings. American Society of Engineering Education. Pittsburgh, PA. June.

Student Advisement

Graduate Student Major Advisor

Jaimie Armitage (MS BSE, Anticipated graduation: Summer 2024))

- Project: Living Shorelines as Nature-Based Alternative for Stabilization
- Funded through One Health Initiative, UTIA-UTK, Facility Services, and BESS Department Teaching Assistantship

Devon Coleman (MS BSET, Withdrew Spring 2019)

- Project: Evaluation of Locally-Sourced Amendments in Engineered Media for Bioretention Stormwater Practices

Bing Cao (MS BSE, Graduated Summer 2017)

- Thesis: "Agricultural Stormwater Loading Variability and Implications on Constructed Wetlands Performance for Pollutant Attenuation."
- Committee: J. Buchanan, D. Yoder, Q. He.
- Funded through the BESS Department Assistantship

Ryan Hodges (MS BSE, Graduated Fall 2015)

- Thesis: "Bankfull Geomorphic Relationships and HEC-RAS Assessment in Small Catchments of the Cumberland Plateau Ecoregion."
- Committee: P. Ayers, J. Schwartz
- Funded through a US EPA Wetlands Development Grant (Subcontract from Auburn University, PI E. Brantley)

Jessica Johnson (MS BSET, Withdrew Spring 2012)

- Project: Evaluation of Urban Hydrology and Implications for Bioretention Projects in East Tennessee Development

Graduate Student Co-Major Advisor

Madeline Ginsburg (MS BSE, Anticipated graduation: Spring 2024))

- Project: Soil Health and Carbon Markets for Sustainable Tennessee Crop Systems
- Funded through Cotton Inc. and BESS Department Teaching Assistantship

Madison Johnson (PhD PPS, Anticipated graduation: Spring 2027))

- Project: Creating a Watershed Prioritization Tool for Community Riparian Restoration in Tennessee
- Funded through the TN Division of Forestry and the TN Department of Environment and Conservation

Graduate Student Committee Member

- Madison Johnson, MS School of Natural Resources
- Ghada Diab, PhD Civil and Environmental Engineering
- Gillian Pilano, PhD Civil and Environmental Engineering
- Whitney Lisenbee, PhD Civil and Environmental Engineering
- Bret Connell, MS Biosystems Engineering Technologies
- Maudy Budipradigodo, MS Biosystems Engineering
- Caleb Lillard, Master of Landscape Architecture
- Daniel Wade, MS Biosystems Engineering
- Haley Gotwald, MS Forestry, Wildlife, Fisheries
- Derek Street, MS Earth Planetary Sciences
- Geoffrey Dueterbeck, MS Entomology Plant Pathology
- Kelsy Hensley, MS Biosystems Engineering
- Brian Baxter, MS Biosystems Engineering Technologies

Undergraduate Extension and Research Student Supervision

- Samuel Neary (Summer Undergraduate Intern, 2023)
 - Aaron Eimers (Summer Extension Intern, 2022)
 - Leeah Sutton (Summer Extension Intern, 2021)
 - Nathaniel (Summer Extension Intern, 2020)
 - Jenna Williams (Summer Extension Intern, 2019)
 - Blue Curry (Summer Extension Intern, 2018)
 - Ryan Watson (Summer Extension Intern, 2017)
-

Professional Credentials and Certifications

Engineer Intern # 6804 AR, December 2004.

Future Professoriate Graduate Certificate, Virginia Tech, 2010.

Strategies and Tactics for Recruiting to Improve Diversity and Excellence, University of Tennessee, 2023, 2018

CITI UTK Social and Behavior Research, University of Tennessee, 2023

Code of Conduct, University of Tennessee, 2022

Title IX Annual Training, University of Tennessee, 2022

Security Awareness, University of Tennessee, 2022

FERPA Training, University of Tennessee, 2022

Advanced WordPress Training, University of Tennessee Institute of Agriculture, 2021

Title VI, University of Tennessee, 2019

Child Protection for UT Covered Adults, University of Tennessee, 2016

**Presentations,
Trainings, and
Invited Talks****Professional Conferences**

1. Ludwig, A. (2023) "The Role of Stormwater Programs and Stakeholders in Protecting Aquatic Ecosystems." Tennessee River Basin Network Conference. Invited Panelist.
 2. Ludwig, A., T. Moore (2023) "Ecological Engineering in a Circular Bioeconomy." Annual International Meeting of the American Society of Agricultural & Biological Engineering, Circular Bioeconomy Systems Day. Invited Presentation.
 3. Ludwig, A. (2023) "The Student Design Competition: A Look Back at a Society Tradition." Annual Meeting of the American Ecological Engineering Society. Refereed.
 4. Ludwig, A., C. Scott, J. Berbiglia (2023) "Tapping the Well that is Private Property to Address Community-Scale Challenges." University Council on Water Resources Conference. Refereed.
 5. Ludwig, A. (2023) "Rains for Tennessee." Tennessee Water Resources Symposium. Refereed.
 6. Johnson, M. A. Ludwig, S. Jean-Philippe, J. Hathaway (2022) "A Proposal for Watershed Prioritization Methodology for Community Riparian Restoration in Tennessee." Tennessee Stormwater Association. Refereed.
 7. Ludwig, A., J. Hathaway (2022) "Going Mainstream with Green Infrastructure for Urban Water Quality." University Council on Water Resources Conference. Refereed.
 8. Ludwig, A., J. Hathaway, L.R. Mason (2022) "Gaining Community Support for Green Infrastructure in Residential Landscapes." Annual Meeting of the American Ecological Engineering Society. Refereed.
 9. Ludwig, A. (2021) "The Rising Role of Voluntary Adoption in Local Stormwater Management." Tennessee Environmental Conference. Refereed.
 11. Johnson, M. A. Ludwig, S. Jean-Philippe, J. Hathaway (2021) "Community Riparian Restoration Program for Tennessee." Tennessee Stormwater Association. Refereed.
 12. Ludwig, A., and M. K. Ross (2021) "Integrated Land Grant University Missions to Prepare the Next Generation Practitioners for Sustainable Landscapes." University Council on Water Resources Conference. Refereed.
 13. Ludwig, A., J. Berbiglia (2021) "Gaining Ground for Healthy Waterways with Sustainable Residential Landscapes." Southeast Stormwater Association Annual Regional Stormwater Conference. Refereed.
 14. Ludwig, A. (2021) "Natural Drainage Systems to Restore Ecosystem Services in Residential Landscapes." International Symposium of the Food-Water-Energy to Support Sustainable Urban Systems. Invited Presentation.
 15. Ludwig, A., A. Jayakaran, T. Moore, D. Blersch, E. Bean (2020) "Annual Business Meeting." American Ecological Engineering Society Annual Meeting. Refereed.
 16. Ludwig, A. (2020) Tennessee Smart Yards and Residential Rain Gardens Update. Chattanooga Development Symposium.
 17. Ludwig, A., B. Curry (2019) "Field Survey and Evaluation of Nashville-Area Bioretention Function." Tennessee Water Resources Symposium. Refereed.
 18. Ludwig, A., B. Curry, R. Dohn, J. Hayes (2019) "Field Survey and Evaluation of Nashville-Area Bioretention Function." Annual Meeting of the American Ecological Engineering Society. Refereed.
 19. Tyner, J. S., D. C. Yoder, A. L. Ludwig, and J. R. Buchanan (2019) "SCS-CN Modification for green infrastructure-based designs." Annual International Meeting of the American Society of Agricultural and Biological Engineers. Refereed.
 20. Ludwig, A., G. Ferry, C. Graves, S. Hamilton (2019) "Innovative Campus Outdoor Classroom Development and Integration in Academic Programs" Annual International Meeting of the American Society of Agricultural & Biological Engineers. Refereed.
-

-
21. Ludwig, A., P. D. Ayers, E. Essington, M. E. Essington, S. A. Hawkins, and F. R. Walker (2018) "Low head dam sediment characterization in southeast Tennessee second order stream." Annual Meeting of the American Ecological Society. Refereed.
 22. Ludwig, A., M. Pleasant, W. C. Wright, R. Hanahan, and G. Ferry (2017) "Changes in Residential Rain Garden Infiltration Capacity in Two Demonstration Gardens." Tennessee Water Resources Symposium. Refereed.
 23. Walker, F. R., A. L. Ludwig, M. E. Essington, S. A. Hawkins, L. B. Reynolds, and P. D. Ayers (2017) "Preparations for dam removal in Athens, Tennessee." Tennessee Water Resources Symposium. Refereed.
 24. Bumgarner, N. R., B. P. Collett, A. L. Ludwig, and C. E. Stewart (2016) Establishing campus rain gardens that link student experiential learning with stakeholder education and outreach. 6th International Conference on Landscape and Urban Horticulture. Refereed.
 25. Ludwig, A., N. R. Bumgarner, B. P. Collett, and C. E. Stewart (2016) "Making UT Green: Creating opportunities for soaking in runoff and knowledge through experiential learning." Tennessee-Kentucky Water Professionals Meeting.
 26. Ludwig, A., B. P. Collett, and C. E. Stewart (2016) Integrating Extension, Teaching and Compliance Using Green Infrastructure at the University of Tennessee. American Ecological Engineering Society National Meeting. Invited.
 27. Ludwig, AL, E Brantley, C Sawyer, G Jennings (2015) "Transforming Landscapes and Perspectives." American Water Resources Association Annual Conference, Denver, CO. Refereed.
 28. Ludwig, AL, J Buchanan, T Gangaware, J Tyner, and D. Yoder (2015) "Tennessee Permanent Stormwater Management Design Training Program." Tennessee Water Resources Symposium, Montgomery Bell State Park, TN. Refereed.
 29. Ludwig, A., D. Yoder, J. Buchanan, J. Tyner, T. Gangaware. "Runoff Reduction in Practice in Tennessee with New Design Tools." Arkansas Water Resources Center Conference. Fayetteville, AR. 2015. Invited.
 30. Ludwig, AL, WC Wright, and D Yoder (2015) "Development of the Tennessee Runoff Reduction Assessment Tool." Published Abstracted of the American Ecological Engineering Society Annual Meeting, Stillwater, OK. Refereed.
 31. Ludwig, AL and RA Hanahan (2014) "Rain Gardens for Tennessee: Show, Tell, Help!" Annual Meeting of the Tennessee Stormwater Association, Henry Horton State Park, TN. Refereed.
 32. Ludwig, AL and WC Wright (2014) "Measured Stormwater Runoff Seasonal Variation in a Small Traditional Suburban Development in East Tennessee." Published Abstracted of the American Ecological Engineering Society Annual Meeting, Charleston, SC. Refereed.
 33. Ludwig, AL. and WC Wright (2013) "Constructed Stormwater Wetlands at the Little River Animal & Environmental Unit, University of Tennessee." Published Abstracts of the American Ecological Engineering Society Annual Meeting, Lansing, MI. Refereed.
 34. DeBruyn, J. and AL Ludwig (2013) "Backyard STEM: Environmental Science Education for Informal Learning Experiences." Printed Abstracts of the Water Education Summit, Chattanooga, TN. Refereed.
 35. Ludwig, AL, KJ Neff, and P Massey (2013) "The State of LID in Tennessee." Proceedings of the 23rd Tennessee Water Resources Symposium, Montgomery Bell State Park, TN. Refereed.
 36. Ludwig, AL (2013) "Retrofitting Stormwater Infrastructure and Perceptions in a Conventional Suburban Development in East TN." Proceedings of the 23rd Tennessee Water Resources Symposium, Montgomery Bell State Park, TN. Refereed.
-

-
37. Ludwig, AL (2012) "Home Stormwater Education Tool Development for Tennessee." Published Abstracts of the 2012 USDA-NIFA National Water Quality Conference, Portland, OR. Refereed.
 38. Ludwig, AL, SA Hawkins, J Lee, L McKay, FR Walker, and R Hunter (2012) "Water quality best management practices at the Little River Animal & Environmental Unit." Proceedings of the 22nd Tennessee Water Resources Symposium, Montgomery Bell State Park, TN. Refereed.
 39. Ludwig, AL (2011) "Constructed Wetland Effectiveness for Stormwater Management." Published Abstracts of the American Ecological Engineering Society Annual Meeting, Asheville, NC. Refereed.
 40. Ludwig, AL (2011) "Constructed Floodplain Wetland for Stormwater Pollutant Management." Proceedings of the 21st TN Water Resources Symposium, Montgomery Bell State Park, TN. Refereed.

Training Workshops, Seminars, and In-Services Delivered

1. "Working with Nature in Our Tennessee Yards." Fall Gardeners Festival, Plateau Research & Education Center. 2023.
 2. "Certified Tennessee Smart Yards Real Estate Agents." Workshop Series in partnership with Wallace Real Estate to develop formal continuing education program for Tennessee Real Estate. Program Lead. 2023.
 3. "Rain Garden Renovation." Full-day workshop for Rutherford County Master Gardeners. Lead Instructor. 2023.
 4. "Soil & Water Interactions." Tennessee Valley Chapter Wild Ones, Hamilton County. 2023.
 5. "Streambank Repair Workshop." Two half-day workshops in Chattanooga, Tennessee. Lead instructor and facilitator. 2023.
 6. "Stewardship and Water Management in the Landscape." Master Gardener Training, Knox County. 2023.
 7. "Growing Greener Communities with Tennessee Smart Yards." Presented paper at the University of Tennessee Outreach and Engagement Symposium. 2022.
 8. "Engineering Elements: Tennessee Water Quality." Virtual Agent In-service Training. 2022.
 9. "Engineering Elements: Hydrologic Desktop Detective." Virtual Agent In-service Training. 2022.
 10. "Soil & Water Interactions." Tennessee Valley Chapter Wild Ones, Hamilton County. 2022.
 11. "Nurturing Native Plants in Your Tennessee Smart Yard." UT Arboretum Society Seminar. Invited Dinner Speaker. 2022.
 12. "The NoogaKnox Challenge" Tennessee Stormwater Association Annual Conference, Invited Luncheon Speaker. 2022.
 13. "Backyard STEM" Regional In-service trainings for 4H Agents. 2022.
 14. "Nurturing Thriving Habitats with Tennessee Smart Yards." Tennessee Environmental Council Seminar. Invited Speaker. 2022.
 15. "Stormwater Management in a Changing Climate: Looking to Nature for Ideas." University of Tennessee Science Forum. Invited Speaker. 2022.
 16. "Stewardship and Water Management in the Landscape." Master Gardener Training, Virtual Statewide. 2022.
 17. "Rain Barrel Make it Take it Workshop." Half-day workshop. Monroe County. Lead Instructor. 2021.
 18. "Stewardship and Water Management in the Landscape." Master Gardener Training, Knox County. 2022.
 19. "Engineering Elements: Sinkholes in Tennessee: What are they and can we fix them?" Virtual Agent In-service Training. 2022.
 20. "Rain Gardens for Tennessee." Fall Gardeners Festival, Plateau Research & Education Center. 2022.
-

21. "Plant Flammability and Selection for Fire Resistant Landscapes." Sevier County. 2022.
 22. "Engineering Elements: Rainwater Harvesting for High Tunnels." Virtual Agent In-service Training. 2021.
 23. "Engineering Elements: Landscape Irrigation and SMART Controllers." Virtual Agent In-service Training. 2021.
 24. "Engineering Elements: Horticulture programs for functional landscapes." Virtual Agent In-service Training. 2021.
 25. "Stewardship and Water Management in the Landscape." Master Gardener Training, Statewide Virtual. 2021.
 26. "Backyard STEM" Regional In-service trainings for 4H Agents. 2021.
 27. "Tennessee Smart Yards." Central Region Master Gardener Conference. 2021.
 28. "Soil & Water Interactions." Tennessee Valley Chapter Wild Ones, Hamilton County. 2021.
 29. "Low Input Landscapes for Tennessee Communities." Grounds Management Shortcourse, Knox County. 2021.
 30. "Engineering Elements: Rain Gardens." Virtual Agent In-service Training. 2020.
 31. "Stewardship and water in the landscape." Master Gardener Training, Madison County. 2020.
 32. "Stewardship and Water Management in the Landscape." Master Gardener Training, Greene County. 2020.
 33. "Stewardship and Water Management in the Landscape." Master Gardener Training, Rutherford County. 2020.
 34. "Backyard STEM at Ridley 4H Camp." Camp Staff Training. Maury County. 2020.
 35. "Stewardship and Water Management in the Landscape." Master Gardener Training, Wilson County. 2020.
 36. "Backyard STEM" Virtual In-service trainings for 4H Agents. 2020.
 37. "Stewardship and Water Management in the Landscape." Master Gardener Training, Sevier County. 2020.
 38. "Tennessee Smart Yards Going Live." Tennessee Stormwater Association Statewide Webinar. 2020.
 39. "Tennessee Smart Yards." Master Gardener Training, Montgomery County. 2020.
 40. "Stewardship and Water Management in the Landscape." Master Gardener Training, Montgomery County. 2020.
 41. "Soil & Water Interactions." Tennessee Valley Chapter Wild Ones, Hamilton County. 2020.
 42. "Stewardship and Water Management in the Landscape." Master Gardener Training, Scott County. 2020.
 43. "Engineering Elements: Wetlands Why Not?" Virtual Agent In-service Training. 2020.
 44. "Stewardship and Water Management in the Landscape." Master Gardener Training, Anderson County. 2019.
 45. "Rain Gardens for Tennessee." Grounds Management and Landscape Professionals Course, Williamson County. 2019.
 46. "Farmstead Engineering." Regional Agent Inservice Training. 2019.
 47. "Stewardship and Water Management in the Landscape." Master Gardener Training, Knox County. 2019.
 48. "Stewardship and Water Management in the Landscape." Master Gardener Training, Sevier County. 2019.
 49. "Constructed Wetlands and Rain Gardens to Manage Runoff and Support Wildlife." Woodlands and Wildlife, Forest Resources Research & Education Center. 2019.
 50. "Stewardship and Water Management in the Landscape." Master Gardener Training, Statewide. 2019.
-

51. "Live Staking to Protect Ditches and Streambanks." Managing Cover Crops, Weeds, Pests, and Improving Irrigation for Soil Health and Water Quality Field Day. Milan Research & Education Center. 2019.
52. "Rain Gardens and Swales for Stormwater Management." Horticulture Hot Topics. 2019.
53. "Rain Gardens for Dogwood Elementary." Knox County. 2019.
54. "Backyard STEM for Teachers" (AgriCenter). 2019.
55. "Backyard STEM" Regional In-service trainings for 4H Agents. 2019.
56. "Stewardship and Water Management in the Landscape." Master Gardener Training, Rutherford County. 2019.
57. "Tennessee Smart Yards." Master Gardener Training, Cumberland County. 2018.
58. "Stewardship and Water Management in the Landscape." Master Gardener Training, Sevier County. 2018.
59. "Stormwater Treatment Assessment Resource Training." Tennessee Stormwater Association Annual Meeting. 2018.
60. "Stewardship and Water Management in the Landscape." Master Gardener Training, Rutherford County. 2018.
61. "Backyard STEM" Regional In-service trainings for 4H Agents. 2018.
62. "Backyard STEM for Teachers" (AgriCenter). 2018.
63. "Farm Conservation Made Easy." Regional Agent In-service Trainings. 2018.
64. "Rain gardens to improve water quality." Middle Tennessee Landscape Management Short course, Williamson County. 2017.
65. "Tennessee Smart Yards." Online Module Review Sessions. 2017.
66. "Working with Water in Tennessee Landscapes." Eastern Region Master Gardener Workshop. 2017.
67. "Backyard STEM" Regional In-service trainings for 4H Agents. 2017.
68. "Backyard STEM for Teachers" (AgriCenter). 2017.
69. "Rain Gardens for Tennessee Workshop." Half-day workshop for Giles County Master Gardeners. Lead Instructor. 2017.
70. "Working with Water in Tennessee Landscapes." East Tennessee Master Gardener Annual Meeting. 2016.
71. "Working with Water in Tennessee Landscapes." Master Gardeners Conference, Chattanooga. 2016.
72. "Rain Garden Workshop." Rutherford County Master Gardener Rain Garden Workshop. 2016.
73. "Sustainable Residential Landscapes for Tennessee." Central Region Tennessee Smart Yards In-service. 2016.
74. "Tennessee Smart Yards." Eastern Region In-service. 2016.
75. "Backyard STEM." Regional In-service trainings for 4H Agents. 2016.
76. "Rain Gardens for Tennessee." Blooms Day. University of Tennessee Gardens. 2016.
77. "Backyard STEM" Regional In-service trainings for 4H Agents. 2015.
78. "Tennessee Permanent Stormwater Design Training Course." Statewide. 2015.
79. "Stream Assessment Protocol Field Demonstration." Tennessee Stormwater Association, Fall Creek Falls State Park. 2015.
80. "Tennessee Permanent Stormwater Design Training Course." Chattanooga, TN. 2015.
81. "Rain Gardens 101." Lower Clinch River Watershed Association. Anderson County. 2015.
82. "Rain Gardens for Tennessee." Shelby County. 2015.
83. "Backyard STEM" Regional In-service trainings for 4H Agents. 2014.
84. "Stormwater Management Innovations with Runoff Reduction in Tennessee." Water Education Summit. Chattanooga, TN. 2014.
85. "Rain Gardens for Tennessee." Blooms Day, UT Gardens, Knox County. 2014.
86. "Water Quality Programs for Tellico River Watershed Association." Loudon County. 2014.

87. "Stormwater Considerations for Ecological Engineering Design." Certified Ecological Designer Workshop, Asheville, NC. 2014.
88. "Stormwater Considerations for Reducing Chemical Use in Landscape Management." Middle Tennessee Grounds Management Short Course, Williamson County. 2014.
89. "Backyard STEM" Regional In-service trainings for 4H Agents. 2013.
90. "Innovations in Green Infrastructure for Stormwater Management." China-USA Joint Land Use Change and Water Conference. Beijing, China. 2013.
91. "Water Across the Urban-Agriculture Interface." Tennessee Association of Conservation Districts Area II Fall Meeting, Knox County. 2013.
92. "Urban Stream Restoration." Workshop, Chattanooga, TN. 2013.
93. "Watershed Academy." Midwest City, OK. 2013.
94. "Runoff Reduction Practices for Tennessee MS4s." Green Development Symposium, Knox County. 2012.
95. "Water Engineering." Gadget Girls Youth Education. 2012.
96. "Watersheds: We're All in This Together." UTK Open Mic Night. 2012.
97. "Backyard STEM" Regional In-service trainings for 4H Agents. 2012.
98. "Water Considerations on the Farm." Milan No Til field Day, Milan, TN. 2012.
99. "Stormwater Management in Dairy Operations." Beef and Dairy Field Day, Little River Animal and Environmental Unit, Blount County. 2012.

Professional Affiliations and Service

- 2020 – Present
- Universities Council on Water Resources**
- Board Member, Elected (2022-2024)
 - Strategic Plan Update, Fall 2023
 - Conference Special Session Organizer (2022)
 - Conference Session Moderator (2023)
- 2004 – Present
- American Ecological Engineering Society**
- Executive Committee
 - Vice President (2019-2020)
 - President (2020-2021)
 - Past President (2021-2022)
 - Committees Membership
 - Certified Ecological Designer (2020-present)
 - Membership (2020-present)
 - Journal of Ecological Engineering Design Committee, Elected Member (2019-present)
 - Conference Planning Committee (2015-present)
 - During COVID, developed and supported web platform for student poster presentations to ensure students maintained an avenue to engage with professionals and present their work during the disruptions of the pandemic (2020 and 2021) - <https://aeeposters.wordpress.com>
 - Student poster competition judge (2019, 2023)
 - Conference Session Moderator (2016, 2018, 2019, 2023)
 - JEED Associate Editor (2021-present)
- 2015 – Present
- American Society of Biological and Agricultural Engineers**
- Committee Membership
 - NRES28
 - NRES25
 - EOPD

- Annual International Meeting Student Poster Judge
 - Blue Ribbon Awards Reviewer
- 2010 – Present **American Water Resources Association (Tennessee Chapter)**
- Member, (2011-Present)
 - Conference Planning Committee (2015-Present)
 - Student Poster Competition Committee Chair (2019-Present)
 - Conference Session Moderator
- 2011 – Present **Tennessee Stormwater Association**
- Education Committee
 - Conference Planning Committee (2023)

Institutional Service

Biosystems Engineering and Soil Science Department

- Departmental Bylaws Committee Chair (2018-2020)
- Mentoring of Junior Faculty
 - E. Fidan, tenure-track, start date 01/2023.
 - L. Duncan, tenure-track, start date 11/2019.
- Ad-hoc Committee to address Master of Science Programs in BESS
- Search committee – Assistant Professor of Ecological Systems (E. Fidan hire)
- High School Introduction to Engineering Studies (HITES) lead host (2017-2020)
- Facilitated ASABE Student Club Service Activities
 - Maintaining and replanting BESS Rain Gardens (2019)
 - Rain Garden Maintenance at Knox County Private Residence (2021)
 - Rain Garden Maintenance at Knox County Private Residence (2022)
- Strategic Planning Committee (2013 – 2014)
- Space Committee (2011 – 2014)
- Search Committee – Department Head (2014-2015)
- Search Committee – Sustainable Row Crop Extension Specialist (2012)

University of Tennessee Extension

- Strategic Plan Implementation Team, Increasing Volunteerism Committee (2022-Present)
- Sustainable Residential Landscapes Workgroup, (Chair 2016-2018, Member 2018-Present)
- Search committees
 - Lone Oaks Farm Director
 - Turfgrass Assistant/Associate Professor, Plant Sciences Department (B. Bowling hire)
 - McMinn County 4-H Agent
- 4-H Project Judging for Engineering and Safety Science, Electric Projects
- Roundup Interview Judge 2023
- 4-H Camp Female Leader, 4-H2O Camp, Polk County, 2019
- Volunteerism Committee (2022-Present)
- ANR/CED Summer Extension Intern Program
 - Supervised 5 Interns (2016-2021)
 - ANR/CED Leadership, Internship Committee (2021-Present)
- State 4-H GIS Committee Member (2022-Present)
- Building Exceptionally Skilled Teachers Development (BEST) Committee (2012-2014)
- Healthy Lifestyles Committee
 - Be Active Committee Member (2016-2019)

- Facilitated May Marathon Month
- Created interactive spreadsheet for Walk Across Tennessee Teams and Generated Team Reports for 20+ Teams
- Committee Chair (2018-2019)

Institute of Agriculture (UTIA)

- Appointed to the UTIA Strategic Planning Committee by Dr. Kieth Carver
- Appointed to the UTK-UTIA Unification Committee by Dr. Tim Cross.
 - Service term 2018-2020
 - Facilitated statewide Listening Sessions for Extension and stakeholder communities
 - Report Produced: "UTIA-UTK Unification Committee Report 2019. <https://tennessee.edu/transparency/utk-utia-unification/committee-report/>
- Faculty Senate
 - Ag Caucus Alternate (2022-Present)
 - Ag Caucus Chair (2018-2020)
 - Senator (2017-2020)
- Greenhouse Space Committee (2014 – 2016)
- UTIA Cherokee Woodlot Wetlands Project Committee
- Subject Matter Expert, Oil and Gas Project, Forest Resources AgResearch and Education Center (2015)

University of Tennessee, Knoxville (UTK)

- Committee for the Campus Environment (2017-Present)
- Student Environmental Initiatives Committee, Faculty Voting Member (2020-Present)
- Hydrolunteers Student Club Faculty co-Advisor
- Watershed Faculty Consortium Member
 - Hosting Watershed Symposium at UT (2012 – 2019)
- Traffic and Parking Authority, Member (2021-Present)
- Eureka Competition Faculty Judge

Federal, State, and Local Governmental Agencies and Organizations

- Reviewer, Tennessee Farm Bureau Conservation Awards (2023)
 - Instructor, Tennessee Naturalist Program, Ijams Program "Living Waters"
 - "Constructed Wetlands." Knox County Americorps Training (2018-2023)
 - "Living Waters." Tennessee Naturalist Program, Ijams Nature Center. Instructor. 2023.
 - Tennessee Nutrient Reduction Strategy Taskforce member
 - Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS) Track 1 Panelist, National Science Foundation (2018)
 - Graduate Research Fellowship Program (GRFP) Reviewer, National Science Foundation (2016)
 - Wate Quality Forum Member representing UT (2015-Present)
 - Chesapeake Bay Expert Panelist, Manure Management (2014)
-

Community Service

- 2022 – Present **Tennessee Naturalist**
- 40 hours environmentally-focused service
 - Completed mandatory class and field studies
- 2023 – 2026 **Native Plant Rescue Squad Board of Directors**
- Board member, 3-year appointment
- 2022 – Present **WATER Science Advisory Board**
- Board member
- 2021 – Present **Little River Watershed Board of Directors**
- Board member
 - "Stream School" instructor, youth education.
 - Volunteer at fundraising events
- 2023 – Present **Sierra Club Land Management Committee**
- Voluntary committee member
- 2014 – 2022 **Board of Environmental Appeals, City of Knoxville**
- Mayor appointed Board member, two terms
-