Dougherty CV

Mark Dougherty, Ph.D., P.E.
Associate Professor
Biosystems Engineering Department
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Education: 1
Research Interests: 1
Research Statement: 1
Professional Certification: 2
Professional Experience: 2
Graduate Students: 2
Peer-reviewed Publications: 6
Conference Papers/Posters Presented: 9
Invited Presentations/Lectures: 11
Funded Projects: 13
Project Proposals Submitted: 14
Outreach, Collaborations, and Other Affiliations: 16
Professional Development Conferences & Workshops Attended: 17
Awards/Affiliations: 18
Professional/Service: 19
Teaching: 22
Teaching aids developed: 23
International work 26

Education:

Ph.D. / May 2004 / Civil & Envir. Engineering / Virginia Tech, Blacksburg, VA, USA
M.S. / 1995 / Biological Systems Engineering / Virginia Tech, Blacksburg, VA, USA
B.S. / 1990 / Agricultural Engineering / Texas Tech, Lubbock, TX, USA
B.S. / 1978 / Geography / Clarion University, Clarion, PA, USA

Research Interests:

Water resources; engineering aspects of water quality; surveying; mapping; and geographic information systems. Water quality management and source water protection using watershed-scale geographic information and field-scale investigation. Environmental impact of green infrastructure; reuse of wastewater for irrigation; and reduction of erosion on steep slopes using biological, mechanical, and chemical systems. Seeking international opportunities to enhance food production systems and urban water usage.

Research Statement:

Sustainable development is one of the most challenging areas facing today's societies. The challenge is to strike a balance between a sustainable environment and an acceptable level of economic progress. My goal is to advance our awareness of the key environmental and social processes impacting conjunctive use of public water resources.

Professional Certification:

Certified Irrigation Designer, Residential (2019)

Certified Professional in Erosion and Sediment Control (2009).

Certified Landscape Irrigation Auditor (2009).

Registered Professional Engineer: Alabama (2005),
Virginia (1999),
Pennsylvania (1999),
New York (1996).

Professional Experience:

Affiliated Faculty of University Writing, Office of the Provost, Auburn University
Auburn, AL, September 2021 - present

Associate Professor, Biosystems Engineering Department, Auburn University
Auburn, AL, August 2010 - present

Assistant Professor, Biosystems Engineering Department, Auburn University
Auburn, AL, August 2004 – July 2010

Research Fellow, Charles E. Via, Jr. Department of Civil & Envir. Engineering, Virginia Tech
Blacksburg, VA, September 2000 – 2004

Project Engineer, Anderson and Associates, Inc.
Blacksburg, VA, Sept. 1999 – Sept. 2000

Research Assistant, Forestry Department, Virginia Tech
Blacksburg, VA, August 1998 – August 1999

Staff Engineer, Natural Resource, Agriculture, and Engineering Service (NRAES)
Ithaca, NY, March 1995 - August 1998

Graduate Students:

1. Tasnim, R.*, Dougherty, Blersch, Adhikari. Use of biochar-entrained porous concrete to mitigate water quality in an urban stormwater. 2025. Masters of Science in Biosystems Engineering. *In progress.*

2. Singh, R.*, Lamba, Way, Gamble, Dougherty. Soil pore characterization at Old Rotation and selected fields. 2025. Masters of Science in Biosystems Engineering. *In progress.*

3. Biessen, D.G.*, Bowers, Anderson, Montgomery, Diefenderfer, Dougherty (served as university reader). 2024. Investigating the effect of moisture on climate vulnerable pavement base aggregates. PhD dissertation in Civil Engineering, Auburn University, AL.

4. Ko, H.*, Blersch, Dougherty. Role of bacteria in the initial attachment and colonization stages of periphytic algae in algal turf scrubbers. 2024. Masters of Science in Biosystems Engineering.

5. Bradley, E.*, Lockaby, Brown, Ostowski, Zipperer, Dougherty (served as university reader). 2023. Impacts of invasive wild pigs, *Sus scrofa*, on water quality and public health. PhD dissertation in College of Forestry, Wildlife, and Environment, Auburn University, AL.

6. Lusta, M.*, Seals, Narayanan, Thomas, Teubner-Rhodes, Dougherty (served as university reader). 2023. PhD dissertation in Department of Computer Science and Software Engineering, Auburn University, AL.

7. Bouselmi, A.*, Khlifi, Dougherty (co-supervisor on PhD committee), Nasr, Zribi. 2023. Adaptation of wheat cultivation to climate change in the northwest of Tunisia. PhD student. Higher School of Engineers of Medjez El Bab, Tunisian Republic. *In progress*.
8. Ud Din, R.*, Haq (controller of examinations), Dougherty (outside evaluator). 2023. Biogas purification, post digestion management and the impact of different nitrogen management strategies on wheat crop. PhD dissertation in Department of Agricultural Mechanization & Renewable Energy Technologies, University of Agriculture, Peshawar, Pakistan.
9. Sader, S.*, Miliordos, Ortiz, Patkowski, Stanbury, Dougherty (served as university reader). 2023. Quantum chemical studies on the catalytic potential of anionic transition metal compounds in methane to methanol and carbon dioxide carboxylation reactions. PhD dissertation in Department of Chemistry and Biochemistry, Auburn University, AL.
10. Din, S.*, Haq (controller of examinations), Dougherty (outside evaluator). 2022. Comparison of mechanical and chemical weed control of wheat-maize cropping system. PhD dissertation in Department of Agricultural Mechanization & Renewable Energy, University of Agriculture, Peshawar, Pakistan.
11. Khachatryan, M.*, van Wyk, Nane, Cao, Hoang, Dougherty (served as university reader). 2022. The numerical approximation of blow-up times for fractional reaction-diffusion equations. PhD dissertation in Department of Mathematics & Statistics, Auburn University, AL.
12. Alkilany, Y.*, Kinnucan, Miao, Nadolnyak, Abebe, Dougherty (served as university reader). 2022. Essays on international development and environmental economics. PhD dissertation in Department of Agricultural Economics & Rural Sociology, Auburn University, AL.
13. Sprague, D.*, Higgins, Blersch, Dougherty. 2021. Solids retention govern nitrification of poultry processing wastewater using an algal-bacterial consortium. Masters Thesis in Biosystems Engineering, Auburn University, Auburn, AL.
14. Rababah, M.*, Smith, Izquierdo, Fernando, Mykoniatis, Liu, Montreuil, Dougherty (served as university reader). 2021. Developing, evaluating, and comparing multiple parcel delivery networks using agent-based simulation. PhD dissertation in Department of Industrial and Systems Engineering, Auburn University, AL.
15. Smith, K.*, Brown, McGhee, Dougherty. Masters of Science in Agriculture (Distance Learning). *In progress*.
16. Abdulrashid, I.*, Han, Caraballo, Hetzer, Van Wyk, Dougherty (served as university reader). 2020. Dynamics of chemotherapy models with variable infusion and time delays. PhD dissertation in Department of Mathematics and Statistics, Auburn University, Auburn, AL.
17. Alawneh, H.*, Umphress, Nguyen, Tauritz, Skjellum, Dougherty (served as university reader). 2020. Android malware detection using data mining techniques on process control block information. PhD dissertation in Department of Computer Science and Software Engineering, Auburn University, Auburn, AL.
18. Alsammani, A.*, Han, Hetzer, Glotov, Van Wyk, Dougherty (served as university reader). 2020. Dynamical behavior of nonautonomous and stochastic HBV infection model. PhD dissertation in Department of Mathematics and Statistics, Auburn University, AL.
19. Ricks, M.*, Fang, Zech, Donald, Perez, Dougherty (served as university reader). 2020. Comparative analysis of large-scale and intermediate-scale test plots for bare soil and different hydromulch products under large-scale rainfall simulator. PhD dissertation in Department of Civil Engineering. Auburn University, Auburn, AL.
20. Roberts, T.*, Rahn, Dougherty, LeBleu, Holley. 2020. Effects of pervious concrete thickness on leachate water temperature during simulated rainfall events. Master of Building Construction, Auburn University, Auburn, AL.
21. Hanif, M.* 2019. PhD dissertation in Department of Agricultural Mechanization, The University of Agriculture, Peshawar, Pakistan (served as outside examiner).

22. Khalafalla, M.*, Benavides, Zech, LaMondia, Azhar, Dougherty (served as university reader). 2019. Cost-duration-based lump sum project selection framework using stochastic methods from design-bid-build resurfacing projects. PhD dissertation. Auburn University, Auburn, AL.
23. Sangha, L.*, Lamba, Srivastava, Dougherty, Prasad, Ortiz. 2019. Influence of climate variability on the ecologicall sutainable water withdrawals from streams for irrigation. Masters thesis, Auburn University, Auburn, AL.
24. Simsek, S.* 2019. PhD dissertation in Department of Mathematics and Statistics (served as university reader).
25. Tahir, E.*, 2019. PhD dissertation in Department of Mathematics and Statistics (served as university reader).
26. Burch, R.*, Dougherty, Delaney, Ortiz, Knappenberger. Crop coefficient estimation using soil tension. Graduate program on hold as of Spring 2020.
27. Whitman, J.B.*, Zech, Donald, Fang, Dougherty. 2018. Performance evalautions of sediment barrier practices ansd unmanned aerial system mapping techniques. PhD dissertation. Auburn University, Auburn, AL.
28. Jones, T.*. Chappelka, Marzen, Mitra, Teeter, Dougherty (served as university reader). 2018. Mapping of Urban Tree Canopy Using LiDAR, Oblique Image Viewers and Geographic Object Based Image Analysis (GeOBIA): a Multi-Scale Approach. PhD dissertation. Auburn University, Auburn, AL.
29. Bonts, E.*, Dougherty. 2017. Water balance analysis in an urban bioretention cell. Master of Engineering, Auburn University, Auburn, AL.
30. Elaswad, A.*, Dunham, Hanson, Peatman, Rashotte, Dougherty (served as university reader). 2016. Genetic technologies for disease resistance in catfish. PhD dissertation. Auburn University, Auburn, AL.
31. Davis, P., Rahn, LeBleu, Hein, Dougherty (served as external reader). 2016. The thermal environmental effects of pervious paving. Master of Building Construction. Auburn University, Auburn, AL.
32. Perez, M.*, Zech, Fang, Vasconcelos, Dougherty. 2016. Improvements in the Design and Application of Erosion and Sediment Control Technologies for the Construction Industry. Phd dissertation. Auburn University, Auburn, AL.
33. Da Cunha, J.*, Ortiz, Dougherty, Knappenberger. 2016. Evaluation of irrigation scheduling methods and nitrogen fertilization effect on corn production in Alabama. Masters thesis. Auburn University, Auburn, AL.
34. Holland, W.*, Dougherty, Chappell, Hanson. 2016. Comparing Economic Returns of Dissolved Oxygen Management in Commercial Catfish Production. Masters thesis. Auburn University, AL.
35. Singh, S.*, Srivastava, Abebe, Lee, Dougherty. 2015. Climate Variability and Irrigation Impacts on Stream-Aquifer Dynamics in the Apalachicola-Chattahoochee-Flint River Basin. PhD dissertation. Auburn University, Auburn, AL.
36. Sidhu, R.*, Dougherty, Zech, Guertal. 2014. Effectiveness of selected erosion control covers during vegetation establishment under simulated rainfall. Masters thesis. Auburn University, AL.
37. Hatcher, T.*, Vasconcelos, Clement, Fang, Khodadadi, Dougherty (served as university reader). 2014. A numerical investigation on gravity currents in pressurized and free-surface systems. PhD dissertation. Auburn University, Auburn, AL.
38. Copeland, C.*, Hein, Dougherty, Thompson. 2014. Historical monitoring of infiltration rates of pervious concrete pavements. Master of Building Construction. Auburn University, AL.
39. Sharifi, A.*, Kalin, Srivastava, Lockaby, Anderson, Dougherty. 2013. Wetland modeling enhancement. PhD dissertation. Auburn University, Auburn, AL.

40. Torlapati, J.*, Clement, Fang, Vasconcelos, Dougherty (served as university reader). 2013. Fluid dynamics in groundwater contamination. PhD Dissertation. Auburn University, AL.
41. Donald, W.*, Zech, Fang, Clement, Vaconcelos, Dougherty. 2013. Evaluation of erosion control channel structures. PhD dissertation. Auburn Universtity, AL.
42. Chang, S.*, Clement, Lee, Fang, Vasconcelos, Dougherty (served as university reader). 2012. Dynamics of saltwater intrusion processes in saturated porous media systems. PhD dissertation. Auburn University, Auburn, AL.
43. Mullenix, D.*, Fulton, McDonald, Son, Adhikari, Dougherty. 2011. Evaluating challenges in small-scale on-farm biodiesel production. Masters thesis. Auburn University, Auburn, AL.
44. Ballard, D.*, LeBleu, Dougherty. 2011. Mine reclamation, emergence, and finite resources management. Masters thesis. Auburn University, AL.
45. Garrison, J.*, Hein, Tatum, Dougherty. 2011. Thermal pollution of storm water runoff from different surface materials. Masters capstone thesis. Auburn University, Auburn, AL.
46. Messer, C.*, Dougherty, Zech, Guertal. 2011. Techiques for maintaining vegetation for erosion control on disturbed slopes in Alabama. Masters thesis. Auburn University, Auburn, AL.
47. Baharanyi, A.*, Guertal, Dougherty, Zech, LeBleu, Grace. 2010. Techniques for establishing vegetation for erosion control on disturbed slopes in Alabama. Masters thesis. Auburn University, Auburn, AL.
48. Jernigan, K.*, Wright, Dougherty, Sibley, LeBleu, Brantley. 2010. Nutrient uptake and plant selection in Southeastern rain gardens. Masters thesis. Auburn University, Auburn, AL.
49. Hobbs, T.* Hein, Dougherty, Williams. 2010. Effective cleaning methods for small area pervious concrete slabs. Masters capstone thesis. Auburn University, Auburn, AL.
50. Bhattarai, N.*, Dougherty, Kalin, Marzen. 2010. Use of remotely sensed data to evaluate irrigation water use in Wolf Bay watershed area. Masters thesis. Auburn University, Auburn, AL.
51. Elias, E.*, Dougherty, Lockaby, Laband, Rodriquez, Srivastava. 2010. Valuing ecosystem services from forested landscapes: How urbanization influences drinking water treatment cost. PhD dissertation. Auburn University, Auburn, AL.
52. Harbuck, T.*, Fulton, Eakes, Taylor, Sibley, Dougherty. 2010. Assessment of precision technologies for accurate delivery of crop inputs. PhD dissertation. Auburn University, Auburn, AL.
53. Srivastava, A.*, Dougherty, Zech, Crowley, and Kalin. 2009. Application and evaluation of WEPP model in a forested watershed with perennial streams. Masters thesis. Auburn University, Auburn, AL.
54. He, J.*, Dougherty, Randall, Fulton, Wood, and Shaw. 2009. Hydraulic management of SDI wastewater disposal in Alabama Black Belt Soils. PhD dissertation. Auburn University, Auburn, AL.
55. Martina, B.*, Hein, Dougherty, Azhar, Schindler. 2008. An analysis of field infiltration measurements and maintenance practices on a pervious concret pavement. Masters capstone thesis. Auburn University, Auburn, AL.
56. Brymer, W.*, Dougherty, Sibley, Fasina. 2008. Assessment of composting methods for use in the green industry. Masters thesis. Auburn University, Auburn, AL.
57. Ducote, E.*, Dougherty, Harper, Fulton. 2006. Integrated control of subsurface wastewater dosing via soil moisture feedback. Master of Civil Engineering, Auburn University, Auburn, AL.

Peer-reviewed Publications:

1. Bergaoui, K, Makram, B.F., Bousselmi, A., Radhouan, N., Kalboussi, R., Cherif, I.C., Morteo, K., Gillet, V., Peiser, L., and M. Dougherty. (2024). *Proceedings of the 12th International Conference on Agro-Geoinformatics*, doi: 10.1109/Agro-Geoinformatics262780.2024.10660694
2. Bouselmi, A., Nciri, R., Kalboussi, R., Dougherty, M., and T. Jarrahi. (2022). Developing decision support tools for irrigation scheduling in Tunisia. *Proceedings of the 2nd International Agroeco Info Symposium*, June 30-July 1, 2022.
3. Dougherty, M., Davis, J.N., Fasina, O., and J.D. Davis. (2022). Cultivating critical thinking and problem solving skills. *ASABE Resource Magazine*, Sept/Oct 2022.
4. Linhoss, J., Davis, J.N., Dougherty, M., and O. Fasina. (2022). Holy inaugural senior capstone, BaTMan. *ASABE Resource Magazine*, Sept/Oct 2022.
5. Lamm, F., Colaizzi, P.D., Sorensen, R.B., Bordovsky, J.P., Dougherty, M., Balkcom, K.,…Troy, R. (2021). A 2020 vision of subsurface drip irrigation in the USA. *Transactions of the ASABE*, Vol. 64(4): 1319-1343, doi:10.13031/trans.14555
6. Wu, Z., Dougherty, M., Chen, Z., Zhou, Y., Zuo, X., and J. He. (2021). Interaction between bioaccumulation and the efficiency of intermittent sand filters in wastewater treatment. *Journal of Cleaner Production*, 335(2021)130303, doi:10.1016/j.jclepro.2021.130303
7. Roberts, T., Rahn, K., Dougherty, M., and C. LeBleu. (2021). Effects of pervious concrete thickness on leachate water temperature during simulated rain events. EPiC Series in Built Environment. *Proceedings of the 57th ASC International Conference*, Vol. XXX, 2021: 634-632.
8. Davis, J.N., Dougherty, M., Fasina, O., and S. Tyndall. (2021). Use and impacts of e-portfolios for Biosystems Engineering graduates. *Proceedings of the 2021 ASABE Annual International Meeting* (Virtual), ASABE Paper No. 2100263, doi:10.13031/aim.202100263
9. He, J., Chen, Z., Dougherty, M., Hu, S., and X. Zuo. (2021). Explore the sludge stabilization process in sludge drying bed by modeling study from mesocosm experiments. *Environmental Research* 195 (2021), doi:10.1016/j.envres.2021.110837
10. Chen, S., Chen, Z., Dougherty, M., Zuo, Z, and J. He. (2021). The role of clogging in intermittent sand filter (ISF) performance in treating rural wastewater retention pond effluent. *Journal of Cleaner Production* (2021), doi:10.1016/j.jclepro.2021.1263309
11. Da Cunha, J., Ortiz, B., Balkom, K., Damianidis, D., Knapenberger, T., and M. Dougherty. (2020). Evaluation of two irrigation scheduling methods and nitrogen rates on corn production in Alabama. *International Journal of Agronomy* (2020), doi:10.1155/2020/8869383
12. Chen, S., Dougherty, M., Chen, Z., Zuo, X., and J. He. (2020). Managing biofilm growth and clogging to promote sustainability in an intermittent sand filter (ISF). *Science of the Total Environment* (2020), doi:10.1016/j.scitotenv.2020.142477
13. He, J., Dougherty, M., and Z. Chen. (2020). Numerical assessment of a soil moisture controlled wastewater SDI disposal system in Alabama Black Belt Prairie. *Chemosphere* 263. doi:10.1016/j.chemosphere.2020.128210
14. Feng, J., Zong, W., Wang, P., Zhang, Z.T., Gu, Y., Dougherty, M., Borobok, I., and Y. Wang. (2020). RRNPP-type quorum sensing systems regulate solvent formation, sporulation and cell motility in Clostridium saccharoperbutylacetonicum. *Biotechnology for Biofuels,* 13(84). doi:10.1186/s13068-020-01723-x
15. Laljeet, S., Lamba, J., Kumar, H., Srivastava, P., Dougherty, M., and R. Prasad. (2020). An innovative approach to rainwater harvesting for irrigation based on ENSO forecasts. *Journal of Soil & Water Conservation*, 75(5) 565-578. doi: 10.2489/jswc.2020.00085
16. LeBleu, C., Dougherty, M., Rahn, K., Wright, A., Bowen, R., Wang, R., Orjuela, J.A., and K. Britton. (2019). Quantifying thermal characteristics of stormwater through low impact development systems. *Hydrology*, 6(16). doi:10.3390/hydrology6010016

17. Dougherty, M. Davis, J., Davis, J., and O. Fasina. (2019). Lifelong learning for engineering graduates. *ASABE Resource Magazine*, Sept/Oct 2019.

18. Dougherty, M., Bouselmi, A., Curtis, L.M., Burmester, C.H., Harkins, H.D., Norris, B.E., and B. Durham. (2018). Sub-surface drip fertigation for site-specific, precision management of cotton. *Proceedings of the Irrigation Association International Meeting*, Long Beach, CA, Dec. 3-6, 2018.

19. Rahn, K, Davis, P, and M. Dougherty. (2017). Laboratory methods examining the effects of pavement runoff. Proceedings of the Creative Construction Conference 2017, CCC 2017, 19-22 June 2017, Primosten, Croatia. *Procedia Engineering* 196 (2017) 527-534.

20. Rahn, K., Dougherty, M., and P. Davis. (2017). Laboratory methods to test thermal and environmental effects of pervious paving runoff. *ASC Proceedings*, ASC 53rd Annual International Conference, Seattle, WA, Feb. 2017.

21. Dougherty, M., Davis, J., Blersch, D., Fasina, O., and S. Taylor. (2016). Building technical skills and success skill. Resource: engineering and technology for a sustainable world. Special Issue, *ASABE Resource Magazine*, Sept/Oct 2016.

22. Elias, E., Rodriquez, H. Srivastava, P. Dougherty, M., James, D., and R. Smith. (2016). Impacts of forest to urban land conversion and ENSO phase on water quality of a public water supply reservoir. *Forests*, 7(2). doi:10.3390/f7020029

23. Fasina, O., Srivastava, P., Dougherty, M., Adhikari, S., McDonald, T., Taylor, S. and M. Marshall. (2015). Incorporating ePortfolios into Student Learning. *Resource Magazine*. ASABE, November/December 2015.

24. Rahn, K., Hein, M., and M. Dougherty. (2015). The contribution of pavements to urban heat islands. *Proceedings of ASC 51st Annual International Conference*, April 22-25, 2015, College Station, TX. Available at ascpro.ascweb.org/chair/paper/CPRT324002015.pdf.

25. Sidhu, R.S., Dougherty, M., Zech, W.C., and B. Guertal. (2015). Cost effectiveness of erosion control covers during vegetation establishment under simulated rainfall. *Journal of Water Resource and Protection*, 7, 119-129. doi: 10.4236/jwarp.2015.72010

26. Elias, E., Laband, D., Dougherty, M., Lockaby, G., Srivastava, P., and H. Rodriguez. (2014). The Public Water Supply Protection Value of Forests: A Watershed-Scale Ecosystem Services Analysis Based upon Total Organic Carbon. *Open Journal of Ecology* 2014 v.04 no.09 pp. 517-531.

27. Bhattarai, N., Quackenbush L.J., Dougherty, M., and L.J. Marzen. (2014). A simple Landsat-MODIS fusion approach to monitor seasonal evapotranspiration at 30 m spatial resolution. *International Journal of Remote Sensing* 36:115-143. doi: 10.1080/01431161.2014.990645

28. Mullenix, D.K., Adhik ari,, S., Runge, M., McDonald, T., Son, A., Dougherty, M.and J.P. Fulton. (2014). Small-Scale Biodiesel Production: A Case Study of On-Farm Economics. *Applied Engineering in Agriculture*. 30(4): 585-592. doi: 10.13031/aea.30.10285

29. He, J., Dougherty, M., and A. AbdelGadir. (2013). Numerical assisted assessment of vadose-zone nitrogen transport under a soil moisture controlled wastewater SDI dispersal system in a Vertisol. *Ecological Engineering* (53):28-234.

30. Elias, E., Dougherty, M., and D. Laband. (2013). Estimating the Public Water Supply Protection Value of Forests. *J. Contemporary Water Research & Education*. Issue 152 (December).

31. Hein, M.F., Dougherty, M., and T. Hobbs. (2013). Cleaning methods for pervious concrete pavements. *International Journal of Construction Education and Research*, 9:2, 102-116.

32. Dougherty, M., Burger, J.A., and C.M. Feldhake, C.M., and A.H. AbdelGadir. (2013). Calibration and use of plate meter regressions for pasture mass estimation in an Appalachian silvopasture. *Archives of Agronomy and Soil Science* 59(2):305-315.

33. He, J., Dougherty, M., Arriaga, F.J., and A.H. AbdelGadir. (2013). Impact of a real-time controlled wastewater subsurface drip disposal system on the selected chemical properties of a Veritsol. *Environmental Technology*, doi: 10.1080/09593330.2012.746737

34. Christian, K.J., Wright, A.N., Sibley, J.L., Brantley, E.F., Howe, J.A., and M. Dougherty. (2012). Effect of phosphorus concentration on growth of *Muhlenbergia capillaris* in flooded and non-flooded conditions. *J. Environ. Hort.* 30(4):219-222.

35. He, J., Dougherty, M., and A.H. AbdelGadir. (2012). Numerical assisted assessment of vadose-zone nitrogen transport under a soil moisture controlled wastewater SDI dispersal system in a Vertisol. *Ecological Engineering*, doi: 10.1016/j.ecoleng.2012.12.048

36. AbdelGadir, A.H., Dougherty, M., Fulton, J.P., Curtis, L.M., Tyson, T.W., Harkins, H.D., and B.E. Norris. (2012). Effect of Different Deficit-Irrigation Capabilities on Cotton Yield in the Tennessee Valley. *Irrigation and Drainage Systems Engineering*, doi: 10.4172/2168-9768.1000102

37. He, J., Dougherty, M., Arriaga, F., Fulton, J., Wood, C., Shaw, and C. Lange, C. (2012). Short-term soil nutrient impact in a real-time drain field soil moisture controlled SDI wastewater disposal system. *Irrigation Science*, doi: 10.1007/s00271-011-0292-2

38. Bhattarai, N., Dougherty, M., Marzen, L., and L. Kalin. (2011). Validation of evaporation estimates from a modified surface energy balance algorithm for land (SEBAL) model in the southeastern US. *Remote Sensing Letters,* 3(6): 511-519, doi: 10.1080/01431161.2011.632655

39. Elias, E., Dougherty, M., Srivastava, P., and D. Laband. (2011). The impact of forest to urban land conversion on streamflow, total nitrogen, total phosphorus, and total organic carbon inputs to the Converse Reservoir, Southern Alabama, USA. *Urban Ecosystems,* doi: 10.1007/s11252-011-0198-z.

40. AbdelGadir, A.H., Fulton, J.P., Dougherty, M., Curtis, L.M., van Santen, E., Burmester, C.H., Harkins, H.D., and B.E. Norris. (2011). Subsurface drip irrigation placement and cotton irrigation water requirement in the Tennessee Valley. *Crop Management,* August 2011, doi:10.1094/CM-2011-0819-01-RS

41. He, J., Dougherty, M., Shaw, J., Fulton, J., and F. Arriaga. (2011). Hydraulic management of a soil moisture controlled SDI wastewater dispersal system in an Alabama Black Belt soil. *J. Environmental Management,* 92(10): 2479-2485.

42. He, J., Dougherty, M., Zellmer, R., and G. Martin. (2011). Assessing the status of onsite wastewater treatment systems in the Alabama Black Belt soil area. *Environmental Engineering Science*, 28(10):693-699.

43. Harbuck, T.L., J. P. Fulton, M. Dougherty, S. T. Taylor, D.J. Eakes, and J.L. Sibley. (2011). In-Field Application Uniformity Evaluation of Pressure-Compensating Subsurface-Drip Irrigation Products. *J. Applied Engineering in Agriculture* 27(1): 43-50.

44. Dougherty, M., Hein, M.S., Martina, B.A., and B.K. Ferguson. (2011). A quick surface infiltration test to assess maintenance needs on small pervious concrete sites. *Journal of Irrigation and Drainage Engineering* 137(8): 553-563.

45. Dougherty, M., AbdelGadir, A.H., Fulton, J.P., van Santen, E., Curtis, L.M., Burmester, C.H., Harkins, H.D., and B.F. Norris. (2009). Subsurface drip irrigation and fertigation for North Alabama cotton production. *Journal of Cotton Science* 13:227-237.

46. Guertal, E.A., Dougherty, M., and E. van Santen. (2009). Soil and effluent irrigation nutrient monitoring of an Alabama golf course. *Applied Turfgrass Science,* doi: 10.1094/ATS-2009-1014-01-RS

47. He, J., Lange, C.E., Dougherty, M. 2009. Laboratory study using paper mill lime mud for agronomic benefit. *Process Safety and Environmental Protection* 87 (2009) 401-405.

48. Dougherty, M., Welsh, R., King, S., and E. Vis. (2009). Teaching landscape irrigation design to non-engineering college students. *J. Applied Engineering in Agriculture.* 254 (2):299-310.

49. Dougherty, M., Vaughan, D.H., Evanylo, G.K., Collins, E.R., Jr., and A.H. AbdelGadir. (2009). Nitrogen values of liquid dairy manure and dry broiler litter as affected by preservation treatment. *J. Applied Engineering in Agriculture.* 25 (3):363-371.
50. Yang, K., He, J., Dougherty, M., Yang, X., Li, L. (2009). Municipal Wastewater Treatment Through an Aerobic Biofilm SBR. *Water Science and Technology*. 59(5): 917-926.
51. LeBleu, C., Dougherty, M., Brantley, E., and C. Francis. (2008). Assessing nutrient reduction in a rain garden with an internal water storage (IWS) layer *In* Negotiating Landscapes, *Proceedings of CELA 2007*: The Council of Educators in Landscape Arch., August 14-19, State College, PA.
52. Dougherty, M., Bayne, D., Curtis, L., Reutebuch, E., and W. Seesock. (2007). Water quality in a non-traditional off-stream polyethylene-lined reservoir. *J. Environmental Management* 85 (2007) 1015-1023.
53. Dougherty, M., Dymond, R.L., Grizzard, T.J., Jr. , Godrej, A.N., Zipper, C.E., Randolph, J., and C.M. Anderson-Cook. (2006). Empirical modeling of hydrologic and NPS pollutant flux in an urbanizing basin. *J.American Water Resources Association* 42 (5) Oct 2006.
54. Dougherty, M., Dymond, R.L., Grizzard, T., Godrej, A., Zipper, C., and J. Randolph. (2006). Quantifying long-term NPS pollutant flux in an urbanizing watershed. *J.Environmental Engineering* 132 (4), 547-554.
55. Dougherty, M., Dymond, R.L., Goetz, S.J., Jantz, C.A., and N. Goulet. (2004). Evaluation of impervious surface estimates in a rapidly urbanizing watershed. *Photogrammetric Engineering & Remote Sensing*, 70(11):1275-1284.

Books:

Dougherty, M. (ed). (1999). Field guide to on-farm composting. Ithaca, NY: *Natural Resource, Agriculture, and Engineering Service (NRAES)*, 128 pp.

Dougherty, M. (ed). (1998). Composting for municipalities: planning and design. Ithaca, NY: *Natural Resource, Agriculture, and Engineering Service (NRAES)*, 136 pp.

Dougherty, M., Goehring, L.D., and P. Wright. (1998). Liquid manure application systems design manual. Ithaca, NY: *Northeast Regional Agricultural Engineering Service (NRAES)*, 168 pp.

Carson, J. and M. Dougherty (ed). (1997) Rev. Post-frame building handbook: materials, design considerations, construction procedures. Ithaca, NY: *Northeast Regional Agricultural Engineering Service (NRAES)*, 79 pp.

Conference Papers/Posters Presented:

Davis, J.N., Linhoss, J.E., Dougherty, M., and O. Fasina. (2025). URISE: Clearning up myths and misconceptins about research and graduate studies for undergraduates through a free online course. Paper approved for the 2025 ASEE Annual Conference & Exposition, June 22-25, 2025.

Bergaoui, K., Fraj, M.B., Bousselmi, A., Neiri, R., Kalboussi, R., Cherif, I., Morteo, KI., Gillet, V., Peiser, L., and M. Dougherty. (2024). FAO WaPOR open access data for improved irrigation advisory services: application examples from countries. Presented at Agro-Geoinformatics 2024 (The 12th International Conference on Agro-Geoinformatics).

Davis, J.N., Dougherty, M., Fasina, O., and S. Tyndall. (2021). Use and impacts of e-portfolios for Biosystems Engineering graduates. Paper presentation at the 2021 ASABE Annual Internationl Meeting (Virtual), July 12-16, 2021.

Roberts, T., Rahn, K., Dougherty, M., and C. LeBleu. (2021). Effects of persvious concrete thickness on leachate water temperature during simulated rain events. EPiC Series in Built Environment. Paper presentation at the 57th ASC (Associated Schools of Construction) International Conference, California State, Chico, CA, April 5-9, 2021.

Sangha, L., Lamba, J., Srivastava, P., Kumar, H., Dougherty, and R. Prasad. (2019). An innovative approach to rainwater harvesting for irrigation based on ENSO forecasts. Paper presentation at 2019 ASABE International Meeting, Boston, MA, July 7-10, 2019.

Sangha, L., Lamba, J., Srivastava, P., Kumar, H., Dougherty, and R. Prasad. (2019). Use of ENSO forecsasts to withdraw water sustainably from streams for irrigation. Poster presentation at 2019 ASABE International Meeting, Boston, MA, July 7-10, 2019.

LeBleu, C., Dougherty, M. Rahn, K., Wright, A., Bowen, R., Wang, R., Orjuela, A., and K. Britton. (2019). Quantifying thermal characteristics of stormwater through low impact development systems. Poster presentation at Faculty Research Symposium, Auburn University, September 2019.

LeBleu, C., Dougherty, M., Rahn, K., and A. Wright. (2019). Thermal characteristics of storm-water through low impact development systems. Poster presentation at Plant Science Research Symposium, Auburn University, December 17, 2019.

Dougherty, M., Bouselmi, A., Curtis, L.M., Burmester, C.H., Harkins, H.D., Norris, B.E., and B. Durham. (2018). Sub-surface drip fertigation for site-specific, precision management of cotton. Irrigation Assocation International Meeting, Long Beach, CA, December 3-6, 2018.

LeBleu, C., Dougherty, M., Rahn, K., and A. Wright. (2018). Using LID to Mitigate Thermal Pollution in Urban Streams and Coastal Receiving Waters. Poster presentation at Bays & Bayous Conference, Mobile Riverview Plaza Hotel, Mobile, AL, November 27-29, 2018.

Rahn, K., LeBleu, C., Wright, A., Dougherty, M., and R. Wang. (2018). Low impact development (LID) practices to mitigate thermal pollution in stormwater runoff entering urban streams and sensitive coastal receiving waters. Poster presentation at Alabama Water Resources Conference, September 7-8, 2018, Orange Beach, Alabama.

Dougherty, M., Davis, J., and J.N. Davis. (2018). ePortfolio for Short- and Long-term Outcomes. Poster presentation at 2018 Conversations in Celebration of Teaching, Auburn University, January 2018.

Rahn, K., Davis, P, and M. Dougherty. (2017). Laboratory Methods Examining the Effects of Pavement Runoff. Creative Construction Conference 2017, 19-22 June 2017, Primosten, Croatia.

Rahn, K, LeBleu, C., Wright, A, Dougherty, M., Wang, R., and B. Garrett. (2017). Mitigating the thermal characteristics of stormwater runoff through low impact development. Poster presentation at Faculty Research Symposium, Auburn University, September 2017.

Fasina, O., Taylor, S., Adhikari, S., Srivastava, P., Dougherty, M. and T. McDonald. (2016). Enhancing the education experience of biosystems engineering students – past 10 years. Poster presentation at Converstions in Celebration of Teaching, January 2016, Auburn University, Auburn, AL.

Rahn, K, LeBleu, C., Dougherty, M., and A. Wright. (2016). Mitigating Heat Transfer from Impervious Surfaces to Stormwater Discharge." Poster presentation at Faculty Research Symposium, Auburn University, September 2016.

Hein, M., Rahn, K, Dougherty, M., and J. Gandy. (2015). The contribution of pavements to urban heat islands. ASC 51st Annual International Conference, April 2015, College Station, TX.

Fasina, O., Srivastava, P., McDonald, T., Adhikari, S., Dougherty, M. and S. Taylor. (2015). Spiralling engineering curriculum: writing transformation. Poster presentation at Converstions in Celebration of Teaching, January 2015, Auburn University, Auburn, AL.

Rahn, K, Dougherty, M., and M. Hein. (2015). "The Contribution of Pavements to Urban Heat Islands." Poster presentation at Faculty Research Symposium, Auburn University, September 2015.

Messer, C., Dougherty, M., Norton, E., Zech, W., Guertal, E., and A. Deshpande. (2012). Evaluating maintenance techniques for long-term vegetation establishment on disturbed slopes in Alabama. International Erosion Control Association Meeting, February 2012, Las Vegas, NV.

Dougherty, M., Messer, R., Guertal, E., Norton, E., and W. Zech. (2011). Establishing, monitoring, and maintaining common bermudagrass on steep slopes in Alabama. International Erosion Control Association Meeting, February 2011, Orlando, FL.

Dougherty, M., Hein, M., and C. Lebleu. (2011). Evaluation of stormwater quality through pervious concrete pavement. ASABE Paper No. 1111579. ASABE Annual International Meeting, Louisville, Kentucky, August 7-10.

Mullenix, D.K.*, S. Adhikari, M. Runge, T.P. McDonald, A. Son, J.P. Fulton, and M. Dougherty. (2011). Small-scale biodiesel production: a case study of on-farm economics. ASABE Paper No. 1111041. ASABE Annual International Meeting, Louisville, Kentucky, August 7-10.

Invited Presentations/Lectures:

Dougherty, M. 2024. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Corley Bioretention ecologically-designed water features. Spring and fall tours conducted (April & September).

Dougherty, M. 2023. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Corley Bioretention ecologically-designed water features. Spring and fall tours conducted (February & September).

Dougherty, M. 2023. Invited speaker for MITE Program (Minorities in Technology and Engineering). "Sustainability in Design" (July).

Dougherty, M. 2023. Invited speaker for Elevated Education Exchange. "Partnering with the Writing Center" (April).

Dougherty, M. 2022. Invited speaker for ENGR 1110-Intro to Engineering, panel discussion. Spring semester (February).

Dougherty, M. 2022. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Corley Bioretention ecologically-designed water features. Spring and fall tours conducted (April & November).

Dougherty, M. 2022. Invited speaker for AGRI 1000-Intro to Agriculture, lecture "Irrigation for sports turf & agricultural production". Fall semester (October).

Dougherty, M. 2021. Invited speaker for AGRI 1000-Intro to Agriculture, lecture introducing basic irrigation concepts in agriculture. Fall semester (face to face. November).

Dougherty, M. 2021. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Corley Bioretention ecologically-designed water features. Fall tour conducted (face to face, October).

Dougherty, M. 2021. Invited speaker for BATM student recruitment video produced by College of Agriculture. August 2021.

Dougherty, M. 2021. Invited speaker for virtual E-day GIS/sandbox video produced by College of Engineering and Department of Biosystems Engineering. February 2021.

Dougherty, M. 2021. Invited speaker (with Dr. Davis and Dr. Blersch) for ASABE Student Section "Professor Night". February 2021 (Zoom meeting).

Dougherty, M. 2020. Invited speaker to Engineers Without Borders, lecture introducing the use of recycled liquids including liquid animal manure using irrigation. Auburn University (Zoom taught).

Dougherty, M. 2020. Invited speaker for AGRI 1000-Intro to Agriculture, lecture introducing basic irrigation concepts in agriculture. Fall semester (Zoom taught).

Dougherty, M. 2020. Invited speaker to Department of Horticulture committee to provide insights on the use of e-Portfolios in their curriculum (face to face meeting, February).

Dougherty, M. 2020. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Corley Bioretention ecologically-designed water features. Spring tour conducted (face to face, January).

Dougherty, M. 2019. Taught class on pumps and piping for Fisheries and Aquaculture Facilities class. Invited by Dr. Allen Davis, Professor, AU Dept. of Fisheries. Spring semester.

Dougherty, M. 2019. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Dudley-Corley ecologically-designed water features. Spring and Fall tours conducted.

Dougherty, M. 2019. Invited speaker for AGRI 1000-Intro to Agriculture, lecture introducing basic irrigation concepts in agriculture. Spring and fall semesters.

Dougherty, M. 2019. Provided hydrology/open channel hydraulics lecture for LAND 5350/6350, February 2019. Invited by Mr. T. Hogge, Instructor/PLA.

Dougherty, M. 2019. Invited speaker for Alabama Irrigation Workshop, presentation on basic drip irrigation applications in Alabama, Decatur, AL, January 22, 2019.

Dougherty, M. 2018. Invited speaker for AGRI 1000-Intro to Agriculture, lecture introducing basic irrigation concepts in agriculture.

Dougherty, M. 2018. Water tour for SUST 2000-Intro to Sustainability, interpretive tour of Dudley-Gorey-Corley ecologically-designed water features. Spring and Fall tours conducted.

Dougherty, M. 2018. Provided hydrology lecture for LAND 5350/6350, February 2018. Invited by Mr. Dan Ballard, Instructor/PLA.

Dougherty, M. 2017. Off-stream storage efficiency in Alabama. Annual Wiregrass irrigation Conference, Dothan, AL, December 7, 2017.

Dougherty, M. 2017. Invited presenter at student service organization Auburn for Water on topic water awareness and global clean water crises. Auburn University, Auburn, AL, April 2017.

Dougherty, M. 2017. Provided hydrology lecture for LAND 5350/6350, February 2017. Invited by Mr. Dan Ballard, Instructor/PLA.

Dougherty, M. 2017. Provided introductory ACAD lecture for BSEN 1110, January 2017. Invited by Dr. Brendan Higgins, Biosystems Engineering.

Dougherty, M. 2017. Developed and taught class and outdoor lab in Corley BRC for pumps and piping for Fisheries and Aquaculture Facilities class. Invited by Dr. Allen Davis, Professor, AU Dept. of Fisheries.

Dougherty, M. 2017. Roundtable presentation. Low impact development surfaces. Alabama Stormwater Symposium. Auburn University, May 12, 2017.

Dougherty, M. and J. Dumars. 2016. Stormwater and Landscape Management at Auburn University, Auburn Stormwater Symposium. Auburn, AL, May 10-12, 2016.

Dougherty, M. Invited speaker at 2015 North Carolina Irrigation Society meeting on topic Off-stream reservoir technology and design implications. Raleigh, NC, November 4, 2015. Invited by Dr. Garry Grabow, President of NCIS, Raleigh, NC.

Dougherty, M. Invited presenter at Business of Water Conference on topic Irrigating more efficiently, Tri Rivers Waterway Development Assocation, Phenix City, AL, October 21-23, 2015. Invited by Mr. Billy Turner, Director Center for Water Resource Economics, Troy University.

Dougherty, M. 2014. Provided a class lecture to a School of Architecture, Planning, and Landscape Architecture design class on stormwater runoff calculation and application. Invited by Instructor Dan Ballard, Adjunct faculty, AU School of Architecture.

Dougherty, M. Invited workshop presenter at Irrigation Scheduling Workshop coordinated by Alabama Cooperative Extension at E.V.Smith Research and Extension Station, February 28, 2013.

Dougherty, M. 2013. Provided two lectures at Irrigation Scheduling Workshop held at E.V. Smith Research Center Conference Facility, Shorter, AL. Invited by Dr. Brenda Ortiz, AU Agronomy & Soils Dept.

Dougherty, M. 2012. Invited member of panel advising future faculty members as part of class taught by Dr. S. Raj Chaudhury, Associate Director, Biggio Center for the Enghancement of Teaching and Learning, Auburn University.

Dougherty, M. 2012. Provided a class lecture to a School of Architecture, Planning, and Landscape Architecture design class introducting research and design activities of Biosystems Engineering faculty to enhance collaboration between departments. Invited by Dr. Ryan Silvas, AU School of Architecture.

Dougherty, M. 2011. Sustainable water and wastewater reuse. Presentation to Engineers without Borders - Auburn University student chapter, Auburn, AL.

Dougherty, M., Guertal, E., Norton, E., Zech, W. 2011. Establishing, monitoring, and maintaining common bermudagrass on steep slopes in Alabama. 2011 Clear Water Alabama. Birmingham, AL, August 24, 2011.

Dougherty, M. 2011. Clear Water Alabama / IECA, “University Research Activities”. A presentation by selected Alabama university faculty active in erosion and sediment control research. Invited by Mr. Earl Norton, AL Soil and Water Conservation Committee.

Dougherty, M. 2011. Developed and taught a specialty pumps and piping lecture with lab for Fisheries and Aquaculture Facilities class. Invited by Dr. Allen Davis, Professor, AU Dept. of Fisheries.

Funded Projects:

Davis, J., Linhoss, J., and M. Dougherty, “Undergraduate research in biosystems engineering,” $10,030. Office of the Provost, Office of Academic Insight, (July 2023).

Wadzinski, Z. and M. Dougherty, “A method of containing near-source undegraded floating plastic,” $1,500. Office of Undergraduate Research. (Feb 2020).

Davis, J., Dougherty, M., and O. Fasina, “Uses and Impacts of E-portfolios for Biosystems Engineering Students after Graduation,” $8,085. Office of the Provost, Office of University Writing, (Feb 2020).

Dougherty, M. “Biosystems engineering teaching equipment proposal – two (2) survey total stations, irrigation control system, and bioretention moisture content monitoring,” $15,757, Auburn University College of Engineering teaching grant, (January 2017).

LeBleu, C., Rahn, K., Wright, A., and M. Dougherty, “Using pervious pavements to mitigate heat transfer between impervious surfaces and stormwater runoff,” $18,000, Auburn University Competitive Research Grant Program, AU-IGP;OVPRED. (May 2016).

Lamba, J., P. Srivastava, D. Blersch, and M. Dougherty, “Nutrient testing equipment for water quality research,” $39,829, AAES Equipment Grant Program. (April 2016).

B. Ortiz, K. Balkcom, M. Dougherty, C. Brodbeck, G. Pate, “Steps towards increasing nitrogen and water use efficiency for corn production: Future smart-agriculture.” $50,000, 2015 AAES Hatch Funding Program. (August 2015).

Dougherty, M., Blersch, D., Wright, A., LeBleu, C., and K. Rahn, “Light system installation for growth and heat balance investigations into water related phenomena,” $29,968, AAES Equipment Grant Program, Alabama Agricultural Experimental Station, Alabama State Funding. (May 2015).

B. Ortiz, G. Pate, T. Knapenberger, A. Hagan, K. Flanders, C. Brodbeck, M. Dougherty, L. Marzen, K. Balkcom, “UAV applications in Alabama farming,” $15,000, Alabama Wheat and Feed Grain Committee. (May 2015).

M. Dougherty and R. Sidhu, “Additional funding for erosion & sediment control study,” $6,974, Alabama General Contractors. (January 2014).

M. Hein, M. Dougherty, and K. Rahn, “Thermal Pollution of Stormwater Runoff from Pervious and Impervious Pavements,” $12,500, Center for Construction Innovation and Collaboration. (January 2013).

C. Lange, M. Hein, and M. Dougherty, “Assessment of stormwater quality through porous pavement systems,” $87,576, Water Resources Research Institute. (December 2012).

C. Lebleu, J. Vasconcelos, M. Dougherty, B. Smith, “CAP Properties-Pittsview-CL” $289, 676, Alabama General Contractors Association. (January 2012).

M. Hein and M. Dougherty, “Pervious and impervious pavements,” $8,000, Auburn Univesrity College of Architecture, Design & Construction. (December 2012).

LeBleu, C., Smith, B., Dougherty, M., and J. Vasconcelos, “Scope of Work and Budget for the Property of the Alabama Chapter of the Associated General Contractors of America in Russell County, Alabama.” $317,041. (December 2011).

M. Dougherty, E. Guertal, C. LeBleu, W. Zech, and E. Norton, “Techniques for vegetation establishment and management on steep slopes of construction sites to provide erosion control and minimize off-site impacts of sediment and turbidity”, $50,000, Federal Hatch Funds. (October 2010).

C. Aria, M. Dougherty, and S. Rikard, “Eliminating human pathogenic Vibrio vulnificus from Gulf Coast oysters with high salinity depuration”, $122,275, NOAA., (October 2010).

M. Dougherty, E. Guertal, W. Zech, C. LeBleu, and E. Norton, Maintaining vegetation for long-term erosion control on disturbed slopes”, $42,050, Alabama Department of Transportation. (May 2010).

Project Proposals Submitted:

Rahn, LeBleu, Carmichael, Dougherty, “A 20-Year Follow-Up Assessment of Water Quality Metrics of Concern in the Lower Reaches of Three-Mile Creek,”$249,094, 2023 NEP Coastal Watersheds Grant Program, May 2023.

Rahn, LeBleu, Dougherty, Wolak, Linhoss, “Evaluating thermal gains to urban stormwater runoff and its effects on thermally sensitive turtle population,” $50,000, 2021 RSP Phase 2 Award Program, Feb 2022.

Rahn, K., LeBleu, C., Dougherty, M., and R. Carmichael, “Thermal stormwater runoff from urban landscapes and impacts on aquatic stressors in Mobile Bay,” $500,000, Alabama Center of Excellence (ALCoE), Feb 2021.

Davis, J., Dougherty, M., and O. Fasina, “Uses and Impacts of E-portfolios for Biosystems Engineering Students after Graduation,” $8,085. Office of the Provost, Office of University Writing, Feb 2020.

Wadzinski, Z. and M. Dougherty, “A method of containing near-source undegraded floating plastic,” $1,500. Office of Undergraduate Research. Feb 2020.

Rahn, K., LeBleu, C., Dougherty, M., and A. Wright, “Characterizing Thermal Characteristics of Storwater Runoff in the Mobile Embayment,” $214,094, Mississippi-Alabama Sea Grant Consortium, June 2019.

LeBleu, C., Dougherty, M., Wright, A., and K. Rahn, “Mitigating the thermal characteristics of storm water runoff through low impact development stormwater control,” $61,491, USGS-WRRI State Water Competitive Grants Program, December 2018.

Rahn, K., LeBleu, C., Wright, A., and M. Dougherty, “Mitigating the thermal characteristics of stormwater runoff through low impact development stormwater control measures,” $15,000, Center for Construction Innovation and Collaboration, December 2018.

Davis, J.N., Davis, J. “High Impact Writing Practices for Biosystems Engineering students,” $2,000, Office of University Writing and College of Agriculture, November 2018.

Lamin, S. et al. (Alabama A&M lead), Feng, Y. et al. (Auburn Univ. sub-contract lead), “Integrated food agricultural production processing and safety (I-FAPPS),” $1.63M sub-contract, AFRI-SAS, October 2018.

Rahn, K., LeBleu, C., Wright, A., and M. Dougherty. “Using Low Impact Development (LID) Practices to Mitigate Stormwater Thermal Pollution Impacting Coastal Receiving Waters,” Letter of Intent to Gulf Research Program, National Academies of Sciences Engineering Medicine, September 2018.

Dillard, L., Bouselmi, A., and M. Dougherty, “Use of a M.I.S.T. irrigation system in bermudagrass and bermudagrass-alfalfa hay production,” $10,000, Alabama Cattleman’s Association, August 2018.

Dougherty, M., LeBleu, C., Wright, A., and K. Rahn. “Thermal impact of low impact developmet (LID) practices on water entering urban streams,” $296,573, Presidential Awards for Interdisciplinary Research (PAIR), March 2018.

West, R., Timm, D., Vasconcelos, J., Zhao, D., Dougherty, M., and A. Simons, “ Innovative porous pavement systems to mitigate environmental impacts of stormwater runoff,” $300,000, Presidential Awards for Interdisciplinary Research (PAIR), March 2018.

LeBleu, C., Wright, A., Rahn, K., and M. Dougherty, “Mitigating the thermal characteristics of stormwater runoff through low impact development stormwater control measures,” $25,000, USGS-WRRI State Water Competitive Grants Program, November 2017.

Lamba, J. and M. Dougherty, “Nutrient testing equipment for water quality research,” $25,000, AAES Equipment Grant Program, November 2015.

LeBleu, C., Rahn, K., Wright, A., and M. Dougherty, “Using pervious pavements to mitigate heat transfer between impervious surfaces and stormwater runoff,” $18,000, Auburn University Competitive Research Grant Program (Intramural Grants Program: Innovative Research Grant), November 2015.

Dougherty, M., Blersch, D., Wright, A., LeBleu, C., and K. Rahn, “Light system installation for growth and heat balance investigations into water related phenomena,” $29,968, AAES Equipment Grant Program, Alabama Agricultural Experimental Station, Alabama State Funding, May 2015.

Ballard, D., Brantley, E., Lebleu, C., and M. Dougherty, “Stormwater quality monitoring for City of Auburn retrofit of Toomer Corner,” NFWF Five Star and Urban Waters Restoration Program, $39,856, February 2015.

Ortiz B., Brantley E., Dougherty M., Feng Y., and G. Sands, “New farming and environmental practices in the Black Belt Prairie region: Agricultural water drainage management and treatment systems,” $574,286, USDA-NRCS CIG program, May 2014.

Hein, M., Lange, C., Heitzman, M., Willis, R., Dougherty, M., Wright, A., and C. LeBleu, “Scaled Assessment of Stormwater Quality and Thermal Properties through Pervious Pavement Systems,” $210,851, NIWR Water Resource Competitive Grants Program, October 2012.

Miller, J., Salvas, R., Sproull, R., Dougherty, M., and O. Fasina, “Radiant assemblies for low income housing,” $10,000, Auburn University School of Architecture, Planning and Landscape Architecture, December 2011.

Adhikhari, Srivastava, Yoo, Dougherty, “Request for laboratory equipment”, $35,000, GFE Award, Auburn University, Auburn, AL, April 2010.

Dougherty, AbdelGadir, Huluka, “Evaluationg the effect of electron-shcarge water on irrigation water quality and plant growth-Phase I”, $54,020, Aquaccion systems, Kiauhou, HI, January 2010.

Hein and Dougherty, “Stormflow monitoring through pervious concrete pavement”, $25,000, USGS – AWWRI, Auburn University, Auburn, AL, November 2010.

Outreach, Collaborations, and Other Affiliations:

September 2022, Attending Peace Corps discussion session for faculty to promote organization to graduating students.

October 2021, provided equipment training for senior Mechanical Engineering student, Will Corey, to complete his senior design project. Training included access to BSEN total station and AutoCAD tutorials previously recorded as Panopto Recordings.

September 2020, provided consultation for former Landscape Irrigation student, Megan Jones (currently 4-H Agent Assistant) to develop drip irrigation system for raised bed garden at an elementary school in south Alabama.

February 2019, presented workshop on Introduction to Landscape Irrigation as part of Alabama Prison Arts + Education Project at Ventriss Correctional Facility, AL.

January 2019, provided advice via e-mail recommending professional design to evaluate stormwater management options for a Homeowner’s Association in the Foley, Alabama area.

May 2018, provided technical assistance to local stakeholder to solve a pumping problem for a large residential subdivision landscape irrigation system.

March 2018, presented workshop on Landscape Irrigation as part of Alabama Prison Arts + Education Project at Staton Correctional Facility, AL.

January 2017, provided limited site design consultation for residential owner of former Habitat for Humanity house through electronic mapping review and topographic assessment, Auburn, AL.

Fall 2015, presented at the AU Research Symposium lightning Applied Design session on the collaborative Senior Design project titled “Pervious pavement parking lot for the AU Arboretum. Also presented as part of poster session with co-authors Keith Rahn and Michael Hein (Building Science) on the project titled “The contribution of pavement to urban heat islands.”

Fall 2014, an article was published in Engineering News at Auburn highlighting the two new bioretention cells recently installed in the Corley courtyard.

December 2012, an article was published by the International Erosion Control Association summarizing the student design project at Fort Benning, GA.

May 2012, an interview was published by the Samuel Ginn College of Engineering highlighting collaborative Biosystems Engineering student design project in Spring 2012 with Ft. Benning, GA staff.

Article titled, “Biosystems engineering seniors design erosion and sediment control plan for Fort Benning.”

Professional Development Conferences & Workshops Attended:

CITI: Responsible Conduct of Research, Parts 1 & 2, Auburn University, April 5, 2024

CR513E Certification for Auburn University Driver Training, AU HR Development, June 10, 2024

CR515E Non-Conventional Vehicle Training, Auburn University, June 10, 2024

2024 Annual Training: Artificial Intelligebnce Scams, Auburn University Information Security, October 25, 2024

2024 Annual Training: Insider Threat, Auburn University Information Security, October 25, 2024

The Generative AI Art + Writing Playground, University Writing, Auburn University, August 1, 2023.

AI Chatbots / Data Breaches and You / QR Codes: Safe Scanning / Phishing Emails: Think Before You Act, Annual Training, Auburn University, October/November, 2023.

Alabama Precision Ag Workshop (attended with BATM 3110 class), Dothan, AL, February, 2023.

Driver Safety Fundamentals, Auburn University. May 2023.

GNSS Basics and Correction Services Overview, Trimble Industries. December 2022.

Auburn University Stormwater Colloquium (online conference), Auburn University. April, 2022.

Envisoning 2050 in the Southeast: AI-driven Innovation in Agriculture (online conference), Auburn University. March, 2022.

College of Agriculture Research Colloquium-SAS Proposal Writing (online workshop), Auburn University. April 2022.

Miller Writing Center Workshop and Shug Jordan Lecture “Writing to Engage” (face-to-face workshop), Auburn University. October 2022.

2022 Cyberscecutity AwarenessTraining. October 2022.

Managing Regulated Waste certification. AU Office of Risk Management. October, 2022.

Miller Writing Center Workshop “Designing your ePortfolio with Wix” (online workshop). Auburn Univesrity. March, 2022.

Spring College of Agriculture Instructional Workshop. (online training), Auburn University. February, 2022.

Cyberscecutity Training and Awareness Top 10 for Users / KnowBe4 Security Awareness Training. Auburn University Annual Cybersecurity Awareness Training. December 2021.

Title IX and Discrimination training course (LG180E): Identifying and responding to sexual misconduct. AU Train. August, 2021.

Managing Regulated Waste certification. AU Office of Risk Management. June, 2021.

General Lab Safety Training certification. AU Office of Risk Management. January, 2021.

Managing Regulated Waste certification. AU Office of Risk Management. October, 2020.

Driver Safety – HE certification competed on June 12, 2020. Auburn University.

Course (Re)Design Badge, Biggio Center for the Enhancement of Teaching & Learning, Auburn University, Course certificate completed March 28, 2019.

Irrigation Association certification tests taken: Specialty landscape irrigation exam – Certified Irrigation Designer (CID) Exam, Long Beach, CA, December. 7, 2018 .

International Irrigation Association Conference, Advanced Landscape Irrigation class (8 CEUs), Long Beach, CA, December 5, 2018.

Auburn University professional development classes: 2018 Summer Course (Re)Design class, Online Search Committee Training course (May 2018).

International Irrigation Association Conference agricultural and landscape irrigation technical sessions, Orlando, FL, November 6-10, 2017.

Irrigation Association technical classes completed: two-wire system technology, basic electrical wiring, and managing an irrigation service company, Orlando, FL, November 2017.

Irrigation Association certification tests completed: General agricultural irrigation exam, general landscape irrigation exam, specialty residential irrigation exam, Orlando, FL, November 2017.

Alabama/Georgia Water Resources and Economics Conference, Alexander City, AL, October 23-24, 2017

Biggio Center Active Learning classes completed; Active learning space, February 21, 2017, Active Learning Technology, March 21, 2017, Auburn University, Auburn AL.

Alabama Stormwater Symposium, Auburn University, Auburn, AL, May 11-12, 2016.

Advanced Precision Agriculture Workshop: Technological Innovations for Sustainable and Profitable Agriculture in the Southeast, Auburn University, Auburn, AL, January 28, 2016.

2015 North Carolina Irrigation Society Meeting, Raleigh, NC, November 4, 2015.

Business of Water Conference, Phenix City, AL, October 21, 2015.

Using the RUSLE2 to predict soil erosion and sediment deposition on construction sites, IECA Southeaster Chapter, March 11-12, 2014.

USDA-NIFA research networking trip, College of Agriculture, Washington, D.C., July 2013.

Awards/Affiliations:

Senior Capstone Showcase Poster Competition, 1st & 2nd place, College of Engineering, 2024

Award for Excellence in Writing (Dept. Biosystems Engin.), University Writing Comm, 2023

Superior Paper Award, (Lamm et al.), ASABE, 2022

Walker Teaching Award, College of Engineering, Auburn University, 2020

Best Reviewer Award, ASCE, EWRI, J. Irrigation & Drainage, 2020

Certified Irrigation Designer, CID, Residential Irrigation, Irrigation Association, 2019.

Dean's Award for Excellence in Instruction, College of Agriculture, Auburn University, 2019

Spirit of Sustainability Award, Auburn University, 2019

AL ASLA Merit Award for Research, Alabama Society of Landscape Architects, 2019

AL ASLA Paper Award, Alabama Society of Landscape Architects, 2019

Certified Irrigation Designer, Residential, Irrigation Association, 2018

Outstanding Reviewer, ASCE Journal of Irrigation & Drainage Engineering, 2018

Gary Brown ePortfolio Faculty Cohort Award, AU Biosystems Engineering Cohort, 2017

USDA-NIFA National Water & Energy Conservation Award, Multistate Project W-3138, 2017

Auburn University Departmental Award for Excellence in Education, 2016

Honorable mention, Emily Bonts, College of Agriculture Graduate Student Competition, 2015/16

Outstanding Faculty, Biosystems Engineering, 2011, 2012, 2015

Award of Excellence, Multi-state project - Microirrgation for Sustainable Water Use, July 2014

President's Outstanding Collaborative Units Award, 2011

Certified Professional in Erosion and Sediment Control, 2010

Certified Landscape Irrigation Auditor, Irrigation Association, 2008

Alabama Professional Engineer, 2005

Appointed, Auburn University graduate faculty, October 2004

VWRRC Competitive Grant Award, 2002-2003

Charles E. Via, Jr. Fellowship Recipient, 2000-2003

ASAE Blue Ribbon Award – two NRAES publications, 1998

American Society of Agricultural and Biological Engineers

The Irrigation Association

Professional/Service:

Member, Curriculum and Assessment Committee, Biosystems Engineering Dept., 2022-present

Recommendation letters: Dr. Lamba (Dean'sTeaching Award), Ayden Kemp (AU Graduate School), Easton Foreman (AU Graduate Research Fellowship), Evan McClelland (NSF ETAP), 2024

Faculty peer reviewer: Dr. Anna Linhoss teaching (BSEN 3230), Dr. Lamba teaching (BSEN 5220), Dr. Sushil Adhikari (FSLI training), Dr. Ortiz (Hatch review), Dr. Davis (Hatch review), 2024

Proposal reviewer: AWRRI AU Doctoral Student Grants Program, Auburn University, 2024.

Paper reviewer: Journal of the ASABE (1), Sustainable Water Resources Mgmt. (1), Water Supply (1), 2024.

Chair, Search committee, Lecturer Machine Systems Engineering, 2023

Member, Equity in design ad hoc committee, College of Engineering, 2023

Member, Davis Arboretum Nature Center and Conservatory (DANCC) ad hoc committee, 2023

Member, Search committee, Departmental Administrative Support Specialist I/II, 2023

Peer reviewer: Dr. Anna Linhoss Proposed Hatch Project, 2022

Peer reviewer: Dr. Jeremiah Davis teaching (BSEN 5450/BATM 5140), 2022

Faculty summary letter: Dr. Jesse Campbell (Promotion to non-tenure track Assoc. Exten. Prof.), 2022

Recommendation letters: Dr. Adhikari (Walker Teaching Award), Bionca King (COAg Administrative Staff Award), 2022

Lead 21 reviewer; Leadership review for Dr. Jeremiah Davis, June, 2022.

Member, University ePortfolio Award Committee, Auburn University, 2022

Manuscript reviewer; Water,Air, & Soil Pollution(1), Ag Water Mgmt(1), Water Supply(2), Sustainable Water Resources Mgmt(1), ACES Extension publication(1), 2022

Judge, Graduate Engineering Research Showcase, College of Engineering, 2021

Judge, Auburn Research: Student Symposium, Auburn University, 2021

Member, Transformation Garden Committee, College of Agriculture, 2021

Guest Associate Editor, 6th Decennial ASABE National Irrigation Symposium, 2020

Chair, Search committee, Coastal Ecological Engineering faculty position, 2020

Judge, Council of Engineering Graduate Research Showcase, Auburn University, 2020

Member, College of Agriculture Curriculum Committee, 2020-present

Member, University Curriculum Committee, Auburn University, 2020-present

Reviewer, IGP Interdisicplinary Team Research Grant Review Committee, 2020

Member, Transformation Gardens Committee, College of Agriculture, 2020

Member, Biosystems Department Scholarship Committee, 2018-present

Chair, Biosystems Department Scholarship Committee, 2005-2018

Peer reviewer; Sustainable Water Resources Management (2023-present),
Journal of the ASABE (2023-present)
Agricultural Water Management (2023-present)
Applied Water Science (2023-present),
Water Science & Technology (2018-present),
Turkish Journal Agriculture & Forestry (2018),
Water Science & Technology (2016-present),
Journal Environmental Quality (2016-present),
Ecological Engineering (2015-present),
Journal Environmental Engineering (2012-present),
Southeastern Geographer (2011-present),
Irrigation Science (2008-present),
Irrigation & Drainage Engineering (2008-present),
Journal Hydrologic Engineering (2006-present),
ASABE Transactions (2005-present).

Judge, Undergraduate Research Symposium, Auburn University, 2019

Judge, Council of Engineering Graduate Research Showcase, Auburn University, 2019

Faculty Mentor, Secondary Science and Engineering Fair (AHS GEARSEF), 2019-2020.

Member, Departmental Search Committee, Specialist I, Multimedia position, 2019

Member, University Curriculum Committee, 2019-present.

Chair, BSEN Centennial (100-year) Celebration Committee, 2019.

Peer reviewer, College of Agriculture Lead 21 leadership training program, Dr. Adhikari, 2019.

Member, SGCOE Interdisciplinary Research Colloquium Committee, 2019-present.

Faculty mentor, Undergraduate research fellowship, Zach Wadzinski, Aero. Engin., 2019-2020.

Peer teaching reviewer, Biosystems Engineering Department, 2019.

Judge/Problem Sponsor, State Envirothon Competition (high school), April 4-6, 2019.

Member, Horticulture Faculty Search Committee, 2019.

Member, College of Agriculture Global Programs Advisory Committee (GPAC), 2018-2019.

Member, College of Agriculture Budget Committee, 2018.

Member, Biosystems Department Centennial Committee, 2017-2018.

Member, Biosystems Department Newsletter Committee, 2017-present.

Grant proposal reviewer, York International Scholars Program (ISP), GPAC faculty support program, Global Programs, College of Agriculture, 2018.

Member, Search Committee, COA/AAES Director of Strategy and Policy for the HSI (Hunger Solutions Institute), College of Human Sciences, 2018.

Departmental representative, SGCOE Interdisciplinary Faculty Research Colloquium Committee, College of Engineering, 2018.

Judge, Three Minute Thesis Competition, Graduate School and Graduate School Council, 2018.

Judge, Graduate Engineering Research Showcase, Council of Engin. Graduate Students, 2018.

Moderator/Judge, This is Research: Student Symposium, Graduate Student Council 2018.

Peer teaching reviewer, Biosystems Engineering Department, 2018.

Member, Outstanding Co-op Student Selection Committee, Auburn University Cooperative Education Program, 2018.

Departmental coordinator, Spring Fundamentals Engineering (FE) Exam Review sessions, 2018.

Member, College of Agriculture Master Planning focus group, 2017

Proposal peer reviewer, NSF Geography and Spatial Sciences Program, 2017

Moderator/Judge, Research Student Symposium, April 2017

Proposal reviewer, AAES Cuba grant proposals, College of Agriculture, 2017

Camp War Eagle, Meet & Greet, College of Engineering, Auburn University, June 22, 2017

Member, Faculty mentoring committee for Dr. Jasmeet Lamba, 2017

Member (representing university Senate), Administrative Review Committee for Dr. John Liu, 2017

Member, consultation team for Landscape Architecture student raingarden design team, 2017

Member, College of Agriculture Global Programs Advisory Committee, 2016-2019.

Poster session judge, College of Agriculture Poster Competition, 2016.

Chair, Search Committee, Departmental Lecturer position, 2016

Member, Search Committee, Associate Dean for Research and Associate Director, AAES, College of Agriculture, 2016

Interviewer, College of Agriculture Distance Education Specialist Search committee, 2016

Departmental co-coordinator, E-day, 2015-present

Planning Committee, Alabama Stormwater Conference, 2015

Technical reviewer, University of Georgia Cooperative Extension irrigation publication, 2015

Faculty judge, AU This is Research Student Symposium, 2015, 2016.

Reviewer, AU Graduate Engineering Research Showcase, 2014, 2015.

Reviewer, AU Environmental Institute Scholarship awards, 2014

Coordinator, BSEN departmental seminar, 2006-2016

Chair, BSEN Water Resources/Ecological Engineering Faculty Search Committee, 2014-2015

AU Faculty Senator, Biosystems Engineering Department, Sept. 2014-present

FE Review instructor, BSEN Department, 2008-2016

Associate editor, Auburn Speaks on Water 2013

Member, BSEN Ecologicial Engineering Faculty Search Committee, 2012-2013

Engineering advisor, Engineers Without Borders - Bolivia irrigation project, 2012-2014

Coordinator, topographic survey and mapping service project for AU Dept. of Fisheries, 2012

Poster session judge, NSF Workshop on Lignocellulosic Biofuels, June 2012

Technical reviewer, ADEM LID Guidebook, Permeable Pavement Chapter, 2012

Faculty evaluator, teaching materials for departmental tenure application, 2012, 2014

Advisor, ASABE Student Branch, 2010-2012

Departmental coordinator, E-day, 2010-2014

Bid reviewer, part-circle center pivot purchase, Auburn University Plant Breeding Unit, 2011

Member, Auburn University Landscape Master Plan Steering Committee, 2011-2013

Lab Safety Supervisor, Biosystems Engineering S&W lab, Corley Building basement, 2008-2016

FE Proctor, NCEES Fundamentals Engineering Exam, 2008-2013

Chair, College of Agriculture Diversity Awards Sub-committee, 2011-2012

Member, College of Agriculture Diversity Committee, 2007-2015

Member, E.T. York Distinguished Lecture Series Committee, 2010-2016

Vice-Chair Continuing Education, ASABE State Section, 2008-present

Member, College of Engineering Scholarship Committee, 2008-2018

Member, College of Agriculture Scholarship Committee, 2006-2018

Member, Biosystems Engineering Department Curriculum Committee, 2005-2006

Member, E.V. Smith Center for Sustainable Rural Living and Learning Committee, 2005-2007

Member, College of Agriculture Teaching Effectiveness Committee, 2005-2007

Teaching:

BATM 4970: Special Topics in Irrigation design (Fall 2024)

BATM 3110 Ag Technology Geospatial Applications (Spring 2023-present)

BSEN 4310 Design Thinking, Remote class for HZAU, Wuhan, China (Summer 2023)

BSEN 4210 Honors Course, Irrigation Design (Fall 2022)

BATM 1110/BSEN 3100 Computer Aided Design Technology (2019-present)

BATM 3560 Turf Systems Irrigation Design (2004-present)

BSEN 4210 Irrigation Design (2004-present)

BSEN 4300 Professional Practice for Biosystems (2007-present)

BSEN 4310 Engineering Design for Biosystems (2004-present)

BSEN 4560/5560 Site Design (2006-2016)

BSEN 4970 Special Problems in Biosystems Engineering (Agricultural Irrigation Technology) (2014)

BSEN 4970 Special Problems in Biosystems Engineering (Self-guided study of ACAD and Land Development Desktop) (2006)

BSEN 4970/7970 Water Matters (2015)

BSEN 4970 Special Topics in Sustainable Composting (2019)

BSEN 4997 Honors Thesis in Biosystems Engineering (2017)

BSEN 7950 Graduate Seminar for Biosystems Engineering (2004-2019)

BSEN 7970 Special Topics in Soil Moisture Sensing (2018)

BSEN 7970 Special Topics in Designing for Effective Monitoring of Urban Bioretention (2019)

BSEN 7970 Special Topics in Irrigation (2014)

BSEN 7970 Special Topics in Application of the WEPP Model (2008)

BSEN 7970 Special Topics in Monitoring for Erosion and Sediment Control (2010)

Teaching aids developed:

Fall 2024 and Spring 2025: I was a collaborator and instructor in the new Next Level Faculty Fellowship program, participating with CDCR to identify courses, assignments, and assessment of student career engagement and the Next Level Program, itself. In Fall 2024, my BSEN 4210 class completed the assignment 'Career Readiness Competencies Reflection'. In Spring 2025, my BSEN 4310 class completed the assignment 'High Impact Experience Reflection. As part of the Nex Level Fellowship program, instructors are asked to provide an Implementation Plan as well as attend scheduled programmatic assessment meetings.

Fall 2024 and Spring 2025: I was a collaborator and instructor in the new BSEN URISE program: Undergraduate Research Improving Studnt Experience. The Canvas-based Master Course was developed as part of the 2024 Bright ideas grant with Drs. Jon Davis and John Linhoss to acquaint undergraduates with the opportunities and components needed to consider graduate school as a post-graduate option. Working directly with Instructure Canvas staff I developed content for Modules 4 and 5, "Technical Writing" and "Posters & Presenting", respectively, including student tutorials, assignments, videos, and worksheet content.

Fall 2024: Taught a special topics BATM 4970: Irrigation design class for two BATM students interested in taking additional topics in irrigation design. These two BATM students had already completed BATM 3560: Landscape Irrigation and had requested additional irrigation design coursework. The special topics class was taught concurrent with BSEN 4210.

Fall 2024: As part of the continuing development of the new class BATM 3110: Ag Technology Geospatial Applications, I developed three training laboratories with graded assignments to provide a smooth transition from the previously licensed ArcMap software to the newly licensed University-wide ArcGIS Pro program currently available for students and instructors. I also assisted in training new faculty, Dr. Virk, to begin teaching this class the following academic year, including the planned transfer of all class notes, homeworks, exams, presentations, and lab assignmentmaterials.

Spring and Fall 2023: As part of the new class BATM 3110: Ag Technology Geospatial Applications, I developed laboratories including field surveying comparing the precision and accuracy of conventional survey equipment with hand-held GPS. Results for both data collection methods were plotted as scale maps of known coordinate system in ArcMap and AutoCAD. A guest speaker from the Department of Geography provided an introduction to LiDAR products and discussed how to obtain, process, display, and interpret them. A set of six (6) GIS maps was developed by the class as part of the final project. All students developed a matrix to assess map ease of use, vertical accuracy, and relative cost to acquire. In the fall, the class was taught again providing me the opportunity to enhance all laboratory and lecture material by adding precision agricultural-related videos, field tours, and hands-on GPS data collection. Auto CAD was incorporated into the class more formerly in the fall.

Fall 2022: As Affiliated Faculty of University Writing and liason for the Biosystems Engineering Department, I developed a final implementation plan for Writing Enriched courses in the BATM curriculum. The implementation plan included a narrative reflection of the preceeding Summer Academy with a follow-up meeting of BSEN/BATM faculty meeting to present the new Curriculum Matrix template and BATM SLOs for rubric development as tools to enhance writing for BATM

students. At the meeting, specific class examples and assignments were introduced to raise faculty awareness of the types of resources available to integrate reflective writing into the BATM curriculum. Syllabus statement and WE Course criteria for student “Practice, Feedback, and Revision” were discussed briefly.

Summer 2022: University Writing staff met with BATM faculty live in the Corley Bldg. conference room for six, 4-hour meetings for the WE Write Summer Academy. Facilitators Chris Basgier and Katharine Brown met with participating faculty Oladiran Fasina, John and Anna Linhoss, and Mark Dougherty each day of the academy. Each of the six days included presentations by University Writing staff with ample time for interactive discussion that included faculty questions about expectations for students and teaching challenges. Several short and long sections were provided for individual and group work time to develop specific course materials and discuss overall BATM curriculum development. Time was provided during each session to allow faculty to progressively develop a writing-focused assignment with constructive faculty peer review. Each faculty also developed a rubric for peer review as a grading and evaluation instrument. Ample time for discussion of expected student outcomes related to rubric development was provided. Each faculty attendee provided input on the original five student writing outcomes which eventually (by the last day of the academy) was consolidated from five Written Communication Learning Outcomes to three as part of a list of suggested task-specific rubric categories.

Summer and Fall 2021: Developed new geospatial course for BATM curriculum, BATM 3110-Ag Technology Geospatial Applications. Three-credit junior level course taught in fall to provide land survey, geospatial, and mapping skills to non-engineering students. Twelve labs developed as part of the new class.

Fall 2021: Appointed Affiliated Faculty of University Writing in support of WE Write curriculum development management for the BATM program. The appointment is a three year commitment starting in September 2021 to coordinate the development of high-impact, disciplie-specifid, writing enriched courses and curriculum. The BATM program is only one of two departmental curricula engaged with University Writing. The appointment carries a salary supplement commensurate with the additional 12-month dutie that include collaborating, assessing, and communicating programmatic changest to the BATM curriculum.

Fall 2020: Developed a Sustainability Course Contract for a student in BSEN 4210 to incorporate and add a roof harvesting design, including drawings, to the regular semester design project in order to fulfill concurrent requirements for a Sustainablity Studies Minor.

Fall 2020: *Course revision as a result of Covid-19*. Developed Panopto teaching modules of 20-50 minutes for remote teaching of four (4) laboratories in BSEN 4210 and BSEN 5230. Field visits to irrigation sites, outdoor field surveying, procedures for reading leveling instrument, calculating compost recipes, and conducting an on-farm nutrient management plan for reuse of liquid dairy manure were recorded for student online access.

Fall 2020: Developed undergraduate research positions for three BSEN students to develop skills in AutoCAD, analytical design, team work, and data monitoring and instrumentation. Students were hired using collaborative research funds from CADC to assist in the development of ongoing pervious pavement and natural rainfall temperature monitoring in the Corley courtyard and the Green Infrastrucure Lab at CASIC.

Spring 2020: *Course revision as a result of Covid-19*. Developed system to successfully administer remote team presentations, peer evaluations, and class evaluations in 100% remote format for BSEN 4310, Senior Design for Biosystems Engineering.

Spring 2020: *Course revision as a result of Covid-19*. Developed AutoCAD-based Panopto tutorials for remote access by non-engineering Landscape Irrigation students (BSEN 3560) for the final

project. A series of five 30-70 minute detailed tutorials showed students step-by-step procedures to create a landscape sprinkler system with accompanying drip irrigation system for a new public school plan in Auburn.

Spring 2019: Developed new assignment for existing turf Irrigation class (BSEN 3560) that requires students to complete a payback analysis for a potential irrigation meter utilizing combination of estimated and actual residential landscape irrigation meter data.

Spring 2019: Developed a new 3-credit Special Topics class, BSEN 4970: Sustainable Composting suitable for students completing Sustainability minor. Objectives of the self-directed class are that students 1) develop a preliminary plan for a sustainable compost facility to recycle pre-consumer kitchen waste from AU dining halls with compost for campus use; 2) develop and propose a preliminary drawing for a pilot composting site that addresses basic system requirements, safety, and transportation logistics, and 3) communicate through a written proposal report the equipment and operational costs of the pilot system in relation to current feedstock disposal fees, including a recommendation on feasibility of the proposed system.

Summer/Fall 2018: Developed a new 3-credit class for new BATM curriculum, BATM 3100 BATM 3100: Computer Aided Design Technology as an introductory course in computer aided design (CAD) and land mapping. Students gain competence in CAD operations used to fabricate parts and to develop field- and watershed-scale maps. Class is designed to provide experience through hands-on computer lab assignments and team projects. Class and project topics include drawing for mechanical part fabrication and scale mapping for construction site development and agricultural field management.

Fall 2017: Developed irrigation system design for Corley BRC with corresponding soil moisture sensing and rainfall monitoring. Pumps were specified and installed to provide demonstration of pumping technology for irrigation. Class design project developed to install drip irrigation for newly planted landscape and potted plants in front of Corley Bldg.

January 2017. Developed teaching materials suitable for Corley courtyard BRC to demonstrate pumps and pump curves for Fisheries and Aquaculture Facilities class.

January 2017: Developed teaching equipment proposal for approximately $15,000 of funding from College of Engineering to support surveying, monitoring, and miscellaneous irrigation equipment for departmental teaching and outreach.

Fall 2015: Developed new class called Water Matters one-credit interdisciplinary to provide a venue for guest lecturers to inform student team projects related to campus water sustainability.

Fall 2015: Using newly completed bioretention cells in Corley courtyard, two new laboratories were developed for BSEN 4210: Irrigation design (media infiltration rate lab) and BSEN 5560: Site Design (planimetric surveying and volume estimation).

Fall 2012: Developed rubric for collaboration with campus client (Environmental Institute) to have BSEN 4560: Site Design students work on a proposed design for pervious pavement parking and associated underground parking lot storage for stormwater retention.

September 2012: Provided a freshman-level biosystems engineering question and answer for Auburn Engineering Magazine's "Are you smarter than a freshman?" section. The question, "You are in a tropical third-world country helping a community develop a water storage structure to take advantage of seasonal rains.You need to estimate the flow of the small stream that will supply water to the planned stoage Using native materials, how would you estimate the flow rate in the stream?"

Summer 2009: In preparation for new Site Design Course (BSEN 4560), taught for the first time in Fall 2009, three learning modules were developed, including 1) site feasibility assessment, 2) road alignment design in ACAD, and 3) collection and mapping of field survey information. Active interfacing GIS and ACAD software was also incorporated as part of class-assigned design projects.

December 2009: In consultation with co-instructor, Dr. Fasina, revised major deliverable milestones for Senior Design Captone class (BSEN 4310) to include two new milestones – preliminary CAD drawings and pre-final submittal drawings and group presentation.

Spring 2005: Irrigation design labs – soil moisture, soil moisture characteristics, introduction to topographic mapping and surveying, horizontal and vertical angle determination, auto-leveling, irrigation efficiency and uniformity, sprinkler irrigation, trickle irrigation.

Spring 2005: Overview lab and lecture for the Dept. of Fisheries and Allied Aquaculture Facilities class, including development of a pump dynamics lab and corresponding lecture on piping systems and pump selection.

Fall 2004: Turf irrigation modules – depth of application and uniformity lab, trickle irrigation, electrical controls, electrical wiring, pumps and pressure, pipes and valves, sprinkler types, sprinkler layout.

International work

Summer 2023: Taught 1 credit remote class called ‘Design Thinking’ as part of Auburn Institute Teaching Proposal to Huazhong Agricultural University, Wuhan, China.

2023: Co-supervise PhD dissertation of Mr. Anis Bouselmi (in progress). ‘Adaptation of wheat cultivation to climate change in the northwest of Tunisia.’ Higher School of Engineers of Medjez El Bab, Tunisian Republic.

February 2023: Participated and presented in online research meeting with faculty and administration from the University of Cape Coast, Ghana, regarding potential collaboration in areas of precision agriculture, bioenergy, and irrigation.

October 2022: Video call with faculty in University of Lima, Peru to engage opportunities within signed MOU with University of Lima and AU Graduate School.

February 2022: Provided letter of certification for Dr. Vilmos Lakatos, Associate Professor, Univesity of Debrecen, Hungary to confirm education exchange visit “Training and content development in higher education” at Auburn University in October 2015, which I hosted.