##### Michelle L. Soupir

##### Associate Professor

##### Agricultural & Biosystems Engineering Department

##### Iowa State University

**Education**

Ph.D. 2008 Biological Systems Engineering Virginia Tech

M.S. 2003 Biological Systems Engineering Virginia Tech

B.S. 1999 Biological and Agricultural Engineering Kansas State University

Honors Program

Secondary Major: Natural Resources and Environmental Sciences

**Professional Experience/Appointments**

### 2014- present Associate Professor, Teaching and Research in the Agricultural and Biosystems Engineering Department, Iowa State University, Ames, IA.

### 2011 – 2014 Black & Veatch “Building a World of Difference” Faculty Fellow, Agricultural and Biosystems Engineering Department, Iowa State University, Ames, IA.

### 2008 – 2014 Assistant Professor, Teaching and Research in the Agricultural and Biosystems Engineering Department, Iowa State University, Ames, IA.

### 2001-2008 Graduate Research Assistant, Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA.

### 2000-2001 Environmental Engineer, Camp Dresser and McKee Inc., Kansas City, MO.

Summer 1999 NSF Research Experience for Undergraduates Program, Biological Systems Engineering Department, Virginia Tech, Blacksburg, VA.

Summer 1998 Environmental Resource Management Intern, Seaboard Farms, Guymond, OK.

1996-1999 Undergraduate Research Assistant, Kansas State University, Biological and Agricultural Engineering Dept., Manhattan, KS.

**Areas of Specialization**

* Research program in the areas of fate and transport of microorganisms and emerging contaminants, NPS pollution control, and water quality monitoring and modeling
* Teaching program in the areas of water quality and watershed-scale modeling
* Member of the graduate faculty and courtesy appointment in Civil, Construction and Environmental Engineering Department
* Member of graduate faculty in Environmental Science and Sustainable Agriculture programs

**Honors and Awards**

* College of Engineering Professional Progress Award, 2016, Kansas State University
* Exemplary Faculty Mentor, 2015, Office of the Senior Vice President and Provost at ISU
* New Holland Young Researcher Award, 2014, ASABE
* ASABE Young Engineer of the Year, 2014, Iowa Section
* Early Career Engineering Faculty Research Award, 2014, Iowa State University
* CALS Early Achievement in Research Award, 2013, Iowa State University
* Outstanding Recent Alumna, Biological Systems Engineering Dept., 2012-2013, Virginia Tech
* UCOWR (Universities Council On Water Resources) Ph.D. Dissertation Award in Natural Science

and Engineering, Certificate of Honorable Mention, 2009

* P.E.O. Scholar Award, 2007-2008, $10,000
* EPA Science to Achieve Results (STAR) Graduate Fellowship, 2006-2009, $20,000/year stipend, $5,000/year technical fund, tuition and fees, Fate and Transport of Pathogen Indicators from Pasturelands. Award total: $111,172. 9/06 to 9/08.
* *AdvanceVT* Ph.D. Graduate Fellowship, 2006-2007, $21,400/year stipend, $1,000/year travel

fund

* Virginia Tech Biological Systems Eng. Dept. Outstanding Ph.D. Student Award, 2006
* Virginia Lakes and Watersheds Association Leo Bourassa Scholarship, 2005, $3,000
* SWCS Kenneth E. Grant Research Scholarship, 2005, $1,300
* Waste Policy Institute Graduate Fellowship, 2005-2006, $2,500
* Virginia Tech Biological Systems Eng. Dept. Outstanding M.S. Student Award, 2004
* AWRA Richard A. Herbert Memorial Scholarship, 2004, $2,000
* National M.S. Graduate Student Research Award, 2nd place, ASABE, 2004
* USDA National Need Doctoral Fellowship, 2003-2006, $22,000/year stipend, $1,000/year

technical fund, tuition

* Virginia Tech Cunningham Fellowship, 2003-2006, $8,000/year
* William R. Walker Graduate Fellow Award, VA Water Resources Research Center, 2002, $2,500
* Pratt Fellowship, 2001-2003, $3,600
* American Society of Agricultural Engineers Student Engineer of the Year, 1999
* National Science Foundation Research Experience for Undergraduates, 1999
* K.K. Barnes National Undergraduate Paper Competition, 2nd place, ASAE, 1998
* Tau Beta Pi (Engineering Honorary), Gamma Sigma Delta (Agriculture Honorary), Order of

Omega (Greek Honorary), Golden Key (All Campus Honorary)

**Soupir Lab Student Awards:**

Conrad Brendel Pak-Liu Fung Scholarship, CCEE Dept., $2,000, 2015

Amy Cervantes Mervin Dougal Memoral Scholarship, CCEE Dept., $1,000, 2011

Honorable Mention, NSF Graduate Research Fellowship Program, 2011

Society of Hispanic Professional Engineers Foundation Academic Scholarship, $3,000, 2011

CCEE Graduate Student Council Travel Scholarship, $500, 2012

Graduate College Professional Advancement Grant, $200, 2012

Shannon Brown ASABE Undergraduate Student Poster Competition, 2nd place, 2012

Jason Garder Mervin Dougal Memorial Scholarship, CCEE Dept., $500, 2011

Graduate College Professional Advancement Grant, $200, 2012

CCEE Graduate Student Council Travel Scholarship, $725, 2012

Rohith Gali Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $2,250, 2014

3rd Place Student Poster Competition, Iowa Water Center Conference, 2011

Graduate College Professional Advancement Grant, $200, 2012

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,500, 2013

AWRA Annual Meeting Student Presenter Poster Competition, 1st place, $100, 2012

Trang Thi Thu Hoang Vietnam Overseas Scholarship Program (VOSP), $27,000/year, 2008-2010

Howard P. Johnson Award: Outstanding M.S. Student, ABE Department, 2010

Natasha Hoover 3rd Place Student Poster Competition, Iowa Water Center Conference, 2011

Claire Hruby 3rd Place Student Poster Competition, Partnership to build capacity in integrated international water resource management expertise, Amman, Jordan, March 2010

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,500, 2012

Environmental Science Graduate Student Symposium Poster Award, 2012

Charles Ikenberry ISU COE 2050 Challenge Fellowship, $7,500, 2011

ISU Brown Graduate Fellowship, $10,000, 2014-2015

Iowa Section ASABE Outstanding Ph.D. Student, 2015

Xiao Liang Graduate College Research Excellence Award, 2015

Graduate College Professional Advancement Grant, $200, 2012

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,500, 2014

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,500, 2015

Rev P.T. Taiganides Award: Outstanding Ph.D. Student in Agricultural Engineering, ISU, $500, 2015

Chunyu Liao Graduate College Research Excellence Award, 2015

Elizabeth Luby 2nd Place Student Poster Competition, Antibiotic Resistance in

Agroecosystems: State of the Science Workshop in Oracle, AZ. August 2014, $50

ISU Miller Graduate Fellowship, $5,000/year, 2014-2017

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,500, 2015

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,000, 2016

Rachel McDaniel ISU Miller Graduate Fellowship, $4,000/year, 2010-2012

Andrew Paxson Science with Practice Poster Symposium, Poster ranked top three, 2010

Selected to participate in the *Undergraduate Research in the Capital* Event in Des Moines, IA, 2011 (poster)

Pramod Pandey 2013 Graduate and Professional Student Senate Peer Research Award, $200

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $4,500, 2012

Rev P.T. Taiganides Award: Outstanding Ph.D. Student in Agricultural Engineering, ISU, $500, 2012

Graduate College Professional Advancement Grant, ISU, $200, 2012

Graduate College Professional Advancement Grant, ISU, $250, 2011

Travel Award by Consortium of Universities for the Advancement of Hydrologic Science, Inc (CUAHSI) for research presentation in the CUAHSI biennial meeting 2012, Boulder, CO, $500, 2012.

European Science Foundation Grant, A grant for presenting research at the ESF-RU Conference: Towards a sustainable bio-based society: aligning scientific, cultural and societal agenda for bio-innovation, Amsterdam, The Netherlands, 6-7 December, €245, 2012

Global Funding for Graduate Students and Postdocs, Support for international agricultural research and education opportunities for graduate students and postdoctoral fellows for participating in research abroad. CALS, ISU, $1000, 2012.

Maurice Washington ISU Miller Graduate Fellowship, $5,000/year, 2012-2015

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $1,500, 2013

Martha Zwonitzer 2nd Place Student Poster Paper Competition, The Dahlia Greidinger Memorial Symposium 2009, Haifa, Israel

3rd Place Student Poster Competition, ASA-CSSA-SSSA International Annual Meeting, Pittsburg, PA.

Harold & Katherine Guy Graduate Fellowship Award, ABE, ISU, $3,000, 2010

**Publications**

**Refereed Journal Articles (48 published, in press, or accepted)**

\* BS, MS, or Ph.D. student supervised by Soupir; \*\*Postdoc or Research Associate supervised by Soupir; ± Paper derived from Soupir’s graduate work

1. Hruby, C.E., M.L. Soupir, M. Shelley, T.B. Moorman, R.S. Kanwar. (accepted) Effects of Tillage and Poultry Manure Application Rates on Salmonella and Fecal Indicator Bacteria Concentrations in Tiles Draining Des Moines Lobe Soils. *Journal of Environmental Management.*
2. Zwonitzer, M.R., M.L. Soupir, L.R. Jarboe, D.R. Smith. (accepted) Quantifying attachment and antibiotic resistance of *Escherichia coli* from conventional and organic swine manure. *Journal of Environmental Quality.* DOI: 10.2134/jeq2015.05.0245
3. Luby, E.M., T.B. Moorman, M.L. Soupir. (accepted). Fate and transport of tylosin-resistant bacteria and macrolide resistance genes in artificially drained agricultural fields receiving swine manure application. *Science of the Total Environment.*
4. Pandey, P.K.\*, M.L. Soupir, Rehmann C.R., Ikenberry, C. (in press). Modified SWAT Model for Developing TMDLs for Bacteria. *Journal of the American Water Resources Association*.
5. Hoover, N.L.\*, A. Bhandari, M.L. Soupir, and T.B. Moorman. (in press). Woodchip Denitrification Bioreactors: Impact of Temperature and Hydraulic Retention Time on Nitrate Removal. *Journal of Environmental Quality.*
6. Gali, R.K.\*, M.L. Soupir, A.L. Kaleita, P. Daggupati. 2015. Identifying potential locations for grassed waterways using terrain attributes and precision conservation technologies. *Transactions of the ASABE*. 58(5) DOI: 10.13031/trans.58.10995
7. Liao, C.\*, X. Liang\*, M.L. Soupir, L.R. Jarboe. 2015. Cellular, particle and environmental properties influencing attachment in waters: A review. *Journal of Applied Microbiology.* 119 (2): 315-330.
8. Hoover, N.L.\*\*, R.S. Kanwar, M.L. Soupir, C. Pederson. 2015. Phosphorus Transport in Soil under Long-Term Applied Poultry Manure. *Water Air and Soil Pollution*. 226:138. DOI: 10.1007/s11270-015-2403-9
9. Pandey, P.K.\*, G.B. Pasternack, M. Majumder, M.L. Soupir, M.S. Kaiser. 2015. A neighborhood statistics model for predicting stream pathogen indicator levels. *Journal of Environmental Monitoring and Assessment.* 187(3): 124. DOI: 10.1007/s10661-014-4228-1
10. Gali, R.K.\* and Soupir, M.L. 2015.Near shore beach volume modeling approach for setting beach bacteria TMDLs: A case study, Hickory Grove Lake, Iowa. *Applied Engineering in Agriculture.* 31(1): 73-82.
11. Pandey, P.K., S. Biswas, V.K. Vaddella, M.L. Soupir. 2015 *Escherichia coli* persistence kinetics in dairy manure at moderate, mesophilic, and thermophilic temperatures under aerobic and anaerobic environments. *Bioprocess and Biosystems Engineering*. 38(3): 457-467. DOI: 10.1007/s00449-014-1285-3
12. Liang, X.\*, M.L. Soupir, S. Rigby, L.R. Jarboe, W. Zhang. 2014. Flow cytometry as a method to partition between freely suspended *E. coli* and *E. coli* attached to clay particles. *Journal of Applied Microbiology.* 117:1730-1739.DOI: 10.1111/jam.12660
13. Pandey, P.K.\*, Soupir, M.L. 2014. Assessing relationships between in –stream *Escherichia coli*, total suspended sediment, and water nutrients during storm flow in an Agricultural Watershed in Iowa. *Transactions of the ASABE*. 57(6): 1571-1581. DOI: 10.13031/trans.57.10371
14. Ikenberry, C.D, M.L. Soupir, K.E. Schilling, C.S. Jones, A. Seeman. 2014. Nitrate-nitrogen export: Magnitude and patterns from drainage districts to downstream river basins. *Journal of Environmental Quality.* 43(6): 2024-2033. DOI: 10.2134/jeq2014.05.0242.
15. Pandey, P.K., P. Kass, M.L. Soupir, S. Biswas, V. Singh. 2014. Contamination of water resources by pathogenic bacteria. *AMB Express*. 4:51 DOI 10.1186/s13568-014-0051-x
16. Garder, J.L.\*, T.B. Moorman, and M.L. Soupir. 2014. Occurrence and movement of total and tylosin resistant enterococci, *erm* genes, and tylosin in tile-drained agricultural fields receiving swine manure application. *Journal of Environmental Quality.* 43:1484-1493.
17. Pandey, P.K.\*, Sethi, L.N., Pholane, L.P., Soupir, M.L., Panda, S. N. 2014. Growth performance and economic analysis of Indian major Carps and Tilapia in Rainwater Ponds. *Fisheries Technology*. 51(2).
18. Brown, S.B.\*, C.D. Ikenberry\*, M.L. Soupir, J. Bisinger, J.R. Russell. 2014. Predicting time cattle spend in streams to quantify direct deposition of manure for TMDL development. *Applied Engineering in Agriculture.* 30(2): 187-195. DOI 10.13031/aea.30.10393
19. Zheng. W., Y. Zhao, H. Xin, B. Li, R.S. Gates, Y. Zhang, and M. Soupir. 2014. Airborne particulate matter and bacteria reduction from spraying slightly acidic electrolyzed water in an experimental aviary laying-hen system. *Transactions of the ASABE*. 57(1):229-236.
20. Yang, Z., H. Xin, D. Zhao, W. Zheng, W. Tian, H. Ma, K. Liu, H. Hu, T. Wang, M. Soupir. 2014. Free chlorine loss during spray of membrane-less acidic electrolyzed water and its antimicrobial effect on airborne bacteria from poultry houses. *Annals of Agricultural and Environmental Medicine*. 12(2): 249-255.
21. Zheng, W., Y. Zhao, H. Xin, B. Li, R. Gates, Y. Zhang, M. Soupir. 2013. Concentrations and size distributions of airborne particulate matter and bacteria in an experimental aviary laying-hen housing system. *Transactions of the ASABE*. 56(6): 1493-1501.
22. Hoang, T.T.T.\*, M.L. Soupir, A. Bhandari, and P. Liu. 2013. Occurrence of tylosin-resistant enterococci in swine manure and tile drainage systems under no-till management. *Water Air and Soil Pollution*. 224:1754. DOI 10.1007/s11270-013-1754-3
23. Pandey, P.K \*, P. van der Zaag, M.L. Soupir, and V.P. Singh. 2013. A model for predicting supplemental irrigation and potential rainwater harvesting for rainfed agriculture. *Water Resources Management*. 27(8) 3145-3164. DOI 10.1007/s11269-013-0340-1.
24. Pandey, P.K. \* and M.L. Soupir. 2013. Assessing the impacts of streambed sediment on total *E. coli* load over a range of flows. *Journal of the American Water Resources Association*. 49(6) 1261-1269 DOI: 10.1111/jawr.12079.
25. McDaniel, R.L.\*, M.L. Soupir, Tuttle, R.\*, and A. Cervantes\*. 2013. Release, dispersion, and resuspension of *E. coli* from direct fecal deposits under controlled flows. *Journal of the American Water Resources Association*. 49(2): 319-327. DOI:10.1111/jawr.12.022.
26. McDaniel, R.L.\* and M.L. Soupir. 2013. Relationships between manure particle and *E. coli* transport from direct fecal deposits under steady-state flows. *Water Air and Soil Pollution*. 224(2). DOI:10.1007/s11270-013-1444-1.
27. Nguyen, H.Q., R.S. Kanwar, N. Hoover\*, P. Dixon, J. Hobbs, C. Pederson, M.L. Soupir. 2013. Long-term effects of poultry manure application on nitrate leaching in tile drainage water. *Transactions of the ASABE*. 56(1): 91-101.
28. Nguyen, H.Q., N. Hoover\*, R.S. Kanwar, P. Dixon, J. Hobbs, C. Pederson, M.L. Soupir. 2012. Effects of repeated surface application of poultry manure crop yield, N uptake and soil nitrate residual from a corn-soybean rotation. *Journal of Research*, published by Punjab Agricultural University, Ludhiana, India.
29. Pandey, P.K.\*, Soupir, M.L. 2012. Impacts of temperatures on biogas production in dairy manure anaerobic digestions. *International Journal of Engineering and Technology.* 4(5): 1793-8244.
30. ±Gali, R., M.L. Soupir and S. Mostaghimi. 2012. Transport of nutrients from various pastureland management scenarios. *Journal of Environmental Monitoring.* 14(9): 2421-2429. DOI:10.1039/C2EM30390F.
31. Pandey, P.K. \*, M.L. Soupir, M. Haddad, J. J. Rothwell. 2012. Assessing the impacts of watershed indexes and precipitation on spatial in-stream *E. coli* concentrations. *Ecological Indicators*. 23:641-652. DOI: 10.1016/j.ecolind.2012.05.023.
32. Pandey, P.K.\* and M.L. Soupir. 2012. A new method to estimate the variation of hourly and long term average daily global solar radiation on horizontal surface. *Atmospheric Research*. 114-115:83-90. DOI:10.1016/j.atmosres.2012.05.012.
33. Pandey, P.K. \*, M.L. Soupir, and C.R. Rehmann. 2012. A model to predict resuspension of *E. coli* from streambed sediments. *Water Research*. 46: 115-126. DOI:10.1016/j.watres.2011.10.019
34. Liu, P., M.L. Soupir, M.R. Zwonitzer\*, B. Huss\*, L.R. Jarboe. 2011. Association of antibiotic resistance in agricultural *Escherichia coli* isolates with attachment to quartz. *Applied and Environmental Microbiology.* 77(19): 6945-6953. DOI: 10.1128/AEM.00717-11.
35. Pandey, P.K. \*, M.L. Soupir, V.P. Singh, and S.N. Panda. 2011. Modeling rainwater storage in distributed reservoir systems in humid subtropical and tropical savannah regions. *Water Resources Management*. 25(13): 3091-3111. DOI:10.1007/s11269-011-9847-5.
36. Pandey, P.K.\* and M.L. Soupir. 2011. *E. coli* inactivation kinetics in anaerobic digestion of solid dairy manure under low, mesophilic and thermophilic temperatures. *AMB Express*. DOI:10.1186/2191-0855-1-18.
37. Pandey, P.K. \*, P.M. Ndegwa, M.L. Soupir, J.R. Alldredge, and M. Pitts. 2011. Efficacies of inocula on the startup of anaerobic reactors treating dairy manure under stirred and unstirred conditions. *Biomass and Bioenergy*. 35(7): 2705-2720. DOI: 10.1016/j.biombioe.2011.03.017.
38. ±Soupir, M.L. and S. Mostaghimi. 2011. *E. coli* and enterococci attachment to particles in runoff from high and low vegetative cover grassland. *Water, Air and Soil Pollution*. 216: 167-178. DOI:10.1007/s11270-010-0524-8.
39. Pandey, P.K. \*, P.M. Ndegwa, J.R. Alldredge, M. Pitts, and M.L. Soupir. 2010. Modeling effects of granules on the start-up of anaerobic digestion of dairy wastewater with Langmuir and extended Freundlich equations. *Bioprocess and Biosystems Engineering*. 33(7): 833-845. DOI: 10.1007/s00449-010-0406-x.
40. ±Soupir, M.L., S. Mostaghimi, and T. Dillaha. 2010. Attachment of *Escherichia coli* and enterococci to particles in runoff from bare soils. *Journal of Environmental Quality*. 39(3): 1019-1027. DOI:10.2134/jeq2009.0296.

*Selected for inclusion in the Research Highlight program from ASA-CSSA-SSSA.*

1. Rehmann, C.R. and M.L. Soupir. 2009. Importance of interactions between the water column and the sediment for microbial concentrations in streams. *Water Research*. 43: 4579-4589. DOI: 10.1016/j.watres.2009.06.049.
2. Soupir, M.L., S. Mostaghimi, and C.E. Mitchem, Jr. 2009. A comparative study of stream-gaging techniques employed during low flows. *Journal of the American Water Resources Association*.45(1): 110-122. DOI: 10.1111 ⁄ j.1752-1688.2008.00264.x.
3. ±Soupir, M.L., S. Mostaghimi, and J. Lou. 2008. Die-off of *E. coli* and enterococci in dairy cowpats. *Transactions of the ASABE*. 51(6): 1987-1996.
4. ±Soupir, M.L., S. Mostaghimi, and N.G. Love. 2008. A method to partition between attached and unattached *E. coli* in runoff from agricultural lands. *Journal of the American Water Resources Association*. 44(6): 1591-1599. DOI: 10.1111 ⁄ j.1752-1688.2008.00262.x.
5. ±Benham, B.L., C. Baffaut, R.W. Zeckoski, Y.A. Pachepsky, K.R. Mankin A.M. Sadeghi, K.M. Brannan, M.L. Soupir, and M.J. Habersack. 2006. Modeling pathogen fate and transport in watersheds to support TMDLs. *Transactions of the ASABE*. 49(4):987-1002.
6. ±Soupir, M.L., S. Mostaghimi, and E.R. Yagow. 2006. Nutrient transport from livestock manure applied to pastureland using phosphorus-based management strategies. *Journal of Environmental Quality*. 35:1269-1278.
7. ±Soupir, M.L., S. Mostaghimi, E.R. Yagow, C. Hagedorn, and D.H. Vaughan. 2006. Transport of fecal bacteria from poultry litter and cattle manures applied to pastureland. *Water, Air and Soil Pollution*. 169(1-4):125-136.
8. Soupir, M.L., S. Mostaghimi, A. Masters, K.A. Flahive, D.H. Vaughan, A. Mendez, and P.W. McClellan. 2004. The effectiveness of polyacrylamide (PAM) in reducing runoff, TSS and nutrient losses from construction sites. *Journal of the American Water Resources Association*. 40(1): 53-66.

**Grant Activities**

*Externally Funded Projects ($2,711,272 as PI, $3,406,556 as co-PI)*

Drainage water quality impacts of agricultural management practices: timing of manure application and use of a winter cereal rye cover crop project. M. Helmers. A. Mallarino, D. Andersen, J. Sawyer, **M. Soupir**, C. Pederson. Iowa Pork Producers. $173,887. 01/01/16 – 12/31/19.

Effect of Manure Application Timing and Management on the Persistence and Transport of Antibiotics and Antibiotic-Resistant Bacteria in Corn and Soybean Production Systems. **M. Soupir**, T.B. Moorman, A. Howe, D. Andersen. National Pork Board. $251,549. 2/1/16-1/31/19.

Evaluation of subsurface drainage on P losses in the Black Hawk Lake Watershed, Iowa. C. Brendel and **M. Soupir**. Iowa Water Center. $5,000 (plus $10,000 ISU cost share). 1/1/16 – 12/31/16.

Diversity of Antibiotic Resistance genes and Transfer Elements Quantitative Monitoring (DARTE-QM) for Environmental Samples. A. Howe, **M. Soupir**, R. Williams, H. Allen, T. Moorman, and S. Hinsa. USDA-NIFA-AFRI Food Safety Challenge. $999,346. 01/01/16 – 12/31/19.

Does increasing landscape diversity in farmed closed depressions (potholes) increase profitability and ecosystem services? A.L. Kaleita, A. Vanloocke, **M.L. Soupir**, E. Heaton. $121,494. Leopold Center for Sustainable Agriculture. 1/1/16 to 12/31/17.

Woodchip bioreactors for improved water quality. **M.L. Soupir**, N.L. Hoover, T.B. Moorman, T. Isenhart. Iowa Nutrient Reduction Center. $73,621. 10/1/15 to 9/30/16.

Monitoring and assessment of closed depressions. A.L. Kaleita and **M.L. Soupir**. $264,859 (plus $88,487 ISU cost-share). U.S. EPA Region 7 Wetland Development Grant Program. 1/1/16 to 12/31/18.

Drainage water quality from manure-treated soybean crops: Bio-Electrical Modification of woodchip bioreactors for enhanced performance. **M. Soupir**, N.L. Hoover, T.B. Moorman. Iowa Soybean Association. $68,577. Submitted 5/18/15.

Metagenomic analysis and modeling of environmental resistance to agricultural antibiotics. **M. Soupir**, A. Howe and T. Moorman. Center for Health Effects of Environmental Contaminants. $30,000. 8/15 to 7/16.

Impact of laying hen manure applications on water quality under continuous corn – Phase 2. R. Kanwar (PI)and **M. Soupir**. Iowa Egg Council. $137,728. 4/15 to 3/18.

An innovative system to improve environment and productivity of aviary hen housing. H. Xin, Y. Zhao, T. Wang, S. Millman, T. Sheperd, **M. Soupir**, R. Parsons. AFRI, USDA NIFA. $500,000. 10/1/14 to 9/30/17.

Augment 2013 Proposal: Research & Assessment of Woodchip Tile Denitrification Bioreactors: Optimal Design/ Performance and Experimental Bioreactor Installation and Study. Iowa Nutrient Research Center. **M. Soupir** and M. Honeyman. $20,000. 7/1/14 to 6/30/15.

Drainage water quality impacts of current and future agricultural management practices. Iowa Nutrient Reduction Center. M. Helmers, **M. Soupir**, A. Mallarino, C. Pederson. $43,242. 6/30/14 to 5/31/16.

National Water Quality Initiative (NWQI) Monitoring in the Black Hawk Lake Watershed. Iowa Department of Natural Resources. **M. Soupir**, A. Kaleita, M. Helmers. $461,661. 7/1/14 to 12/30/19.

Hydrologic impacts of microwetlands in the Des Moines Lobe. A.L. Kaleita (PI) and **M.L. Soupir**. Iowa DNR. $38,556. 1/15/14 to 1/31/15.

Simple and fast detection of pathogens in recreational waters. R. Cademartiri (PI) and **M. Soupir**. Center for Health Effects of Environmental Contaminants. 3/14 to 2/15. $30,000.

Simple and Fast Detection of Bacteria in Recreational Waters. Water Environment Research Federation. R. Cademartiri (PI) and **M. Soupir**. $195,513 ($105,384 WERF, $90,132 ISU cost-share). 3/1/14 to 2/1/16.

Simple and Fast Detection of *E. coli* in Agricultural Water Sources and Runoff. Leopold Center for Sustainable Agriculture. Cademartiri (PI) and **M. Soupir**. $20,000. 1/1/14 to 12/31/14.

Research & Assessment of Woodchip Tile Denitrification Bioreactors: Optimal Design/ Performance and Experimental Bioreactor Installation and Study. Iowa Nutrient Research Center. **M. Soupir**. $80,000. 10/1/13 to 9/30/15.

Persistence and Transport of Veterinary Antibiotics and Antibiotic-Resistant Bacteria in Midwestern Farming Systems. USDA-NIFA AFRI Renewable Energy, Natural Resources, and Environment (RENRE): Soil, Air, and Water Processes in Agroecosystems. T. Moorman, **M. Soupir**, D. Busch, R. Malone. $460,000 ($226,510 sub-contract to ISU). 10/1/13 to 9/30/16.

Drainage water quality from manure-treated soybean crops: Assessment of woodchip bioreactors for edge-of-field treatment. Iowa Soybean Association. **M. Soupir** (PI), N. Hoover, T. Moorman, M. Helmers. $136,296. 10/1/13 to 9/30/15.

Genetic and environmental factors driving *E. coli* attachment to particles in streams. **M. Soupir (PI)**, L. Jarboe, M. Thompson. National Science Foundation. $304,554. 10/1/2012 to 9/30/2015.

Evaluation of pothole wetland impacts on downstream water quantity and quality, and analysis of tile drain management as a potential tool for water resource protection. **M. Soupir (PI)**, C. Ikenberry, P. Gassman. Agriculture’s Clean Water Alliance. $20,000. 3/1/12 to 5/30/13.

Occurrence and Movement of Antibiotics, Antibiotic Resistant Bacteria and Resistance Genes in Tile-Drained Agricultural Fields Receiving Swine Manure Application. **M. Soupir (PI)**, T. Moorman, M. Helmers. National Pork Board. $172,127. 4/1/12 to 3/31/15.

Sequence analysis of transferable genes encoding bacterial attachment and multi-drug resistance. L. Jarboe (PI), **M. Soupir**, C. Logue, L. Nolan. Center for Health Effect of Environmental Contamination, University of Iowa. $30,000. 6/1/12 to 5/31/13.

Modeling Supplement: Hickory Grove Lake Watershed Management Plan. **M. Soupir (PI)**. Iowa DNR Watershed Planning Grant Program. $3,600. 7/1/11 to 12/31/12.

REU Supplement: Resuspension of *E. coli* in Sediment Laden Streams. National Science Foundation CBET-0967845. **M. Soupir (PI)**. $5,625. 5/01/12 to 8/31/12.

Investigation of bacteria transport and resistance mechanisms and implications for water quality from confinement swine and beef grazing production systems in Iowa. **M. Soupir**, M. Thompson, M. Helmers (Thompson, Soupir and Helmers are equal PIs), L. Jarboe R. Kanwar, A. Mallarino. Leopold Center for Sustainable Agriculture. $162,100. 3/1/12 to 2/28/15.

Impact of laying hen manure applications on water quality under continuous corn. R. Kanwar (PI)and **M. Soupir**. Iowa Egg Council. $120,000. 6/11 to 12/14.

Hickory Grove Lake Watershed Management Plan. **M. Soupir** **(PI)** and M. Helmers. Iowa DNR Watershed Planning Grant Program. $63,880 (State - $41,969, ISU cost-share - $21,911). 7/1/11 to 12/31/12.

Occurrence and Movement of Antibiotic Resistant Bacteria and Resistance Genes in Tile-Drained Agricultural Fields Receiving Swine Manure Application. National Pork Board. **M. Soupir (PI)**, T. Moorman, A. Bhandari. $29,743. 10/01/10 to 10/01/11.

Improving a watershed scale model to integrate wetlands into watershed planning. U.S. EPA Region 7 Wetland Development Grant Program. **M. Soupir (PI)**, P. Gassman, M. Jha, W. Crumpton, and M. Helmers. $303,390 (Federal - $225,998, ISU cost-share - $77,392). 10/01/10 to 4/30/13.

REU Site: Sustainable Production and Processing for Biomass-Derived Fuels of the Future. National Science Foundation EEC-1004227. PIs: R. Raman (PI), **M. Soupir**, A. Bhandari; Collaborators: M. Darr, D. Grewell, T. Kim, M. Helmers, A. Kaleita, and R. Anex. $311,790. 9/1/10 to 8/31/13.

Resuspension of *E. coli* in Sediment Laden Streams. National Science Foundation CBET-0967845. **M. Soupir (PI)**. $365,000. 6/01/10 to 5/31/13.

Hickory Grove Water Quality Improvement Plan. Iowa Department of Natural Resources. **M. Soupir (PI)**, M. Helmers and A. Bhandari. $148,718. 12/01/09 to 12/31/12.

National Academy of Engineering Travel Grant to Changsha, China. **M. Soupir**. $2,000. 10/17/09 to 10/21/09.

REU Site: Summer Undergraduate Research Experiences in Biogeosciences at Iowa State University. National Science Foundation EAR-0851669. PIs: U. Sunday Tim, S. Mickelson and A. Kaleita; Collaborators: R. Kanwar, G. Takle, M. Helmers, B. Crumpton, **M. Soupir**, A. Bhandari. $351,513. 8/15/09 to 7/31/12.

Improving SWAT for developing TMDLs for bacteria. U.S. EPA Region 7 TMDL Program. **M. Soupir (PI)** and C. Rehmann. $78,830. 1/1/09 to 12/31/11.

The Potential Role of Poultry Manure Fertilizer in Pathogen and Pharmaceutical Contamination of Soil and Water. Iowa Egg Council. R. Kanwar and **M. Soupir**. $90,000. 6/30/08 to 6/29/11.

An International Perspective on Agricultural Waste Management. U.S. Department of Agriculture, Food and Agricultural Sciences National Needs Graduate Fellowships Graduate Program – Special International Study or Thesis/Dissertation Research Travel Allowances. 2005-00730. **M. Soupir (PI)**, S. Mostaghimi, A. Dietrich. Amount: $10,000. Duration: 8/15/05 to 6/1/07.

*Internal ISU or Virginia Tech Funded Projects*

Increasing student engagement through seminar series and plant tours. S. Chopra, M. Soupir, G. Mosher, and R. Hoffman. Women’s and Diversity Program Application. ISU, Ames, IA. $5,000. 7/15 to 6/16.

ABE Miller Graduate Fellowship Application. M.L. Soupir. $30,000. Submitted 11/13/14.

Analysis of Tylosin Concentrations in Soil and Water Samples. M. Mika, L. Long, M. Soupir. First-year Honors Mentor Program Grant, $200.00. Spring Semester 2013.

Impact of Poultry Production and Processing Practices on Emergence of Plasmid-Bearing *Escherichia coli* and *Salmonella spp.* on Retail Poultry Meat. Lisa Nolan; Catherine Logue; Ganwu Li; Annette O’Connor; Darrell Trampel; Michelle Soupir; Laura Jarboe (all ISU); and Verlin Hinsz (NDSU). ISU Health Research Initiative. $35,000. 10/5/12 – 6/1/13.

Honors Summer Research Grant awarded to Conrad Brendel, $1,000, Summer 2012.

Hickory Grove Lake Water quality Improvement Project. N. Terhall, C. Brandel, R. Gali, M. Soupir. First-year Honors Mentor Program Grant, $342.95. Spring Semester 2012.

Proposal for Equipment Support: Water Quality Research Laboratory. Support provided by COE ($17,739), ABE Dept ($10,000), and CCEE Dept ($10,000). M. Soupir. $37,739. Submitted January 9, 2012.

Agricultural and Biosystems Engineering. Miller Graduate Fellowship Application, Iowa State University. M. Soupir. $30,000. Submitted November 1, 2011.

Request for ABE Diversity Funding to support Graduate Recruitment Weekend. M. Soupir. $4,000. Submitted November 22, 2011.

Proposal for Technician Support: Water Quality Research Laboratory. Support provided by CALS. M. Soupir and M. Helmers. $30,000. FY12 – FY15.

Agricultural and Biosystems Engineering. Miller Graduate Fellowship Application, Iowa State University. M. Soupir. $15,000. Submitted November 1, 2010.

Further Renovation of a Teaching Flume. Differential Tuition Project Proposal FY2009. C. Rehmann and M. Soupir. $26,000. (with $10,000 cost sharing from CCEE and $5,000 cost sharing from ABE) Duration: 9/08 to 7/09.

Renovation of a Teaching Flume. Differential Tuition Project Proposal FY2008. C. Rehmann, R. Gu, R. Kanwar and M. Soupir. $15,000. Duration: 1/08 to 7/08.

Modeling fecal bacteria die-off in cattle direct deposits during winter conditions. Virginia Tech Graduate Research Development Project (GRDP) Grant. M.L. Soupir and S. Mostaghimi. $600. Duration: 1/07 to 12/07.

Establishing a relationship between bacterial partitioning and water quality indicators. Virginia Tech Graduate Research Development Project (GRDP) Grant. M.L. Soupir and S. Mostaghimi. $375. Duration: 12/05 to 6/06.

Improved Methods for Modeling *E. coli* Fate and Transport from Agricultural Sources. Virginia Tech Graduate Research Development Project (GRDP) Grant. M.L. Soupir and S. Mostaghimi. $375. Duration: 12/04 to 6/05.

**Research Laboratory and Staff Management**

**Supervision of Professional Staff**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Position** | **Responsibilities** | **Dates** |
| Leigh Ann Long | Research Associate II | Manage WQRL and NWQI Monitoring of Black Hawk Lake Watershed | 5/12 - present |
| Natasha Hoover | Research Associate II | Manage woodchip bioreactor research projects | 5/12 - present |
| Loren Shires | Research Associate | Manage WQRL | 8/10 – 5/11 |

**Professor In Charge of Research and Teaching Laboratories**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Location** | **Purpose** | **Dates** |
| WQRL – Micro | 4205 Sukup | Soupir research lab – BSL2 | 6/14 - present |
| WQRL - Nutrients | 4207 Sukup | Service Lab – nutrient analysis | 6/14 - present |
| Hydrology Lab | 0208 Sukup | Recirculating Flume | 6/14 - present |
| Land and Water Resources Teaching Lab | 4208 Sukup | Undergraduate and graduate instruction | 6/14 - present |
| Support Space | 4201 and 4204 Sukup | Autoclave, dishwasher, coolers | 6/14 - present |
| WQRL – Micro | 3145 NSRIC Bldg | Soupir research lab – BSL2 | 5/08 – 6/14 |
| WQRL - Nutrients | 3145 NSRIC Bldg | Service Lab – nutrient analysis | 8/10 – 6/14 |
| Microbiology Lab | 3125 NSRIC Bldg | Department BSL2 lab | 8/10 – 6/14 |
| Instrument Room | 3132 NSRIC Bldg | Cooler/Freezer/Field storage area | 8/10 – 6/14 |

**Student Advising**

**Served as postdoctoral research advisor for the following student:**

|  |  |  |
| --- | --- | --- |
| **Name** | **Project** | **Dates** |
| Bailey Sullivan | USDA project on antibiotics and resistant organisms  Current position: University of Arkansas - Lecturer | 1/14 – 6/15 |
| Pramod Pandey | NSF project on resuspension of *E. coli* in streams  Current position: University of California -Davis Extension Specialist | 8/12 – 5/13 |

**Served as Major Professor or Co-major Professor for the following graduate students (20 total, 4 PhD and 9 MS graduated):**

|  |  |  |
| --- | --- | --- |
| **Name** | **Degree/Position** | **Thesis Title** |
| Ji Yeow Law | B.S./M.S. ABE begun 8/15 |  |
| Conrad Brendel | M.S. ABE begun 5/15 |  |
| Miguel Chavez-Santoscoy5 | M.S. CBE begun 8/14 |  |
| Elizabeth Luby3 | Ph.D. AE begun 8/14 |  |
| Chenkai Wu | M.S. ABE begun 8/13  Completed 2/16 | Long term effect of poultry manure application on water quality, yield under a corn-corn system in Iowa |
| Ross Tuttle | M.S. ABE begun 1/13 |  |
| Chunyu Liao1 | Ph.D. Microbiology begun 8/10  Completed 12/15 | Genetic Factors Driving Attachment of *Escherichia coli* to Stream Particles |
| Maurice Washington3 | Ph.D. AE begun 8/12 | Monitoring and modeling of agricultural emerging contaminants (AECs) under tile-drained conditions |
| Elizabeth Luby3 | M.S. AE begun 8/12  Completed 7/14  Current position: PhD student | Fate and transport of antibiotic resistant bacteria and resistance genes in artificially drained agricultural fieldsreceiving swine manure application |
| Jason Garder3 | M.S. CE begun 5/11 completed 9/12  Current position: Environmental Engineer, CDM Smith, KC, MO | Occurrence and movement of total and tylosin resistant enterococci, erm genes and tylosin in tile-drained agricultural fields receiving swine manure application |
| Charles Ikenberry | Ph.D. AE begun 1/11  Current position: Iowa DNR | Evaluation and prediction of hydrology and nitrate-nitrogen transport in tile-drained watersheds |
| Xiao Liang4 | Ph.D. AE begun 5/12  Completed 12/15  Current position: Data Scientist at Elevate | Bacterial, particulate, and environmental factors driving *E. coli* attachment to particles |
| Xiao Liang | M.S. AE begun 8/10  completed 4/12 | Method to partition between freely suspended *Escherichia coli* and *Escherichia coli* attached to clay particles |
| Natasha Hoover2 | M.S. Env. Sci. begun 6/10, completed 4/12  Current position: Research Associate ABE ISU | Denitrification woodchip bioreactor two-phase column study: evaluation of nitrate removal at various hydraulic retention times and effect of temperature on denitrification rates |
| Rohith Gali | Ph.D. AE begun 6/10, completed 4/14  Current position: Agricultural Engineer, Waterborne Environmental, Inc. | Assessing monitoring and modeling approaches to improve water quality in the Hickory Grove Lake |
| Amy Cervantes | M.S. CCEE begun 6/10, completed 4/12  Current position: Environmental Engineer, Seneca Companies, Des Moines, IA | Resuspension of *E. coli* under controlled flows and stream bottom substrates |
| Claire Hruby | Ph.D. Env. Sci. begun 1/10  Completed 5/15  Current position: Geologist, Iowa DNR | The Effects of Poultry Litter Application on Tile Water Quality, Associated Transport Processes, and Laboratory Methods |
| Rachel McDaniel | M.S. AE begun 1/10, completed 8/11  Current position: Assistant Professor, SDSU | Understanding bacterial transport from direct fecal deposits under controlled flows |
| Pramod Kumar Pandey | Ph.D. AE begun 1/09, completed 12/12  Current position: University of California -Davis Extension Specialist | Modeling In- Stream *Escherichia coli* Concentrations |
| Trang Thi Thu Hoang | M.S. Env. Sci. and AE begun 8/08, completed 12/10 | Occurrence of tylosin-resistant enterococci in swine manure and tile drainage systems under no-till management. |
| Martha Zwonitzer1 | M.S. Env. Sci. begun 8/08, completed 8/15  Current position: Research Assistant, Texas A&M AgriLife Research, Lubbock/Halfway & Pecos | Exploring the relationship between transport and resistance of *Escherichia coli* collected from swine manure |

1Co-advised with Dr. Laura Jarboe

2Co- advised with Dr. Alok Bhandari

3Co- advised with Dr. Thomas Moorman

4Co- advised with Dr. Michael Thompson

5Co-advised with Dr. Rebecca Cademartiri

**Teaching**

**Courses Taught at Iowa State University:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Course Number | Course Title | Semester | Number of Students | SCH |
| TSM 424 | Impacts of Agriculture on Water Quality (3 credits) | F08  F09  F10\* | 7  13  19 | 21  39  57 |
| AE/TSM 401 | Professional Development Seminar (1 credit) | S09  F09 | ~50  55 | ~50  55 |
| AE 537 | TMDL Development and Implementation  (3 credits) | S10  F11  F13  F15 | 7  6  9  5 | 21  18  27  15 |
| ABE 432/532X | NPS Pollution & Control | S11  S15 | 10  7 | 30  21 |
| AE 436/536 | Design & Evaluation of Soil &Water Monitoring Systems | S12  S14  S16 | 8  12 | 8  24 |
| AE/BSE 218 | Project Management and Design in ABE | S13  S14  S15  S16 | 57  62  43  73 | 57  62  43 |
| BSE 380 | Principles of Biological Systems Engineering | S13  S14  S15 | 9  13  16 | 1.5  0.6  0.6 |
| ABE/IST 601 | Graduate Seminar | F15 | 36 | 36 |

\*Course taught by graduate student C. Hruby while on maternity leave

**Curriculum & Course Development**

* Developed new course material for ABE 601 Graduate Seminar and added a STE (Science Technology Engineering) Slam competition at the end of the semester which was open to all faculty and graduate students in ABE
* Revised material for ABE 432/532 and added a hands-on lab to the class; this is the only upper level course within the land & water or bioenvironmental options with a hand-on lab section (2015)
* Developed new course material for BSE 380 to integrate bioenvironmental content into the course.
* Worked with ABE Engineering Curriculum Committee to update course recommendations for AE and BSE students in the environmental options.
* Developed new lecture content and assignments for water quality section in AE 436/536
* Completely redesigned course content, lecture material and homework assignments for TSM 424
* Developed ABE 537 TMDL Development and Implementation including lecture materials, homework and lab assignments based on input from Iowa Department of Natural Resources Watershed Planning Group in 2009; the course was renamed to Watershed Modeling and Policy in 2015
* Developed new assignments including a speaker assessment rubric for AE/TSM 401 which resulted in improved instructor ratings from 3.79 to 4.65.

**Professional Practice**

**Professional Affiliations & Society Service**

American Water Resources Association, Member, 2003 – present

Associate Editor, *Journal of Environmental Quality* (2012-2017)

American Society for Engineering Education, Member, 2008 – present

Society of Women Engineers, Member, 2013 – present

Soil and Water Conservation Society, Member, 2004 – present

American Society of Microbiology, Member, 2015 – present

Society of Agricultural and Biological Engineers, Member, 1997 – present