

Mary Lusk

University of Florida/IFAS, Regional Specialized Agent for Water Resources
Gulf Coast Research and Education Center
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Education

- 2015 Ph.D.** Soil and Water Science (emphasis in urban biogeochemistry), Univ. of Florida
- 2005 M.S.** Geoscience (emphasis in Science Education), Brigham Young University
- 1998 M. S.** Crop and Soil Environmental Science, Virginia Tech
- 1994 B.S.** Agronomy and Horticulture, Brigham Young University

Research and Extension Experience

University of Florida/IFAS Extension, *Gulf Coast Research and Education Center, Plant City, FL, 2016 to Present*

Regional Specialized Agent for Water Resources

- Developing statewide extension, applied research, and outreach programs related to fertilizer fate in residential urban landscapes, stormwater pond management, and nutrient considerations for using reclaimed water.
- Serving as the lead developer and instructor for statewide extension inservice trainings on residential irrigation practices, onsite wastewater treatment systems, water quality best management practices for urban farms, and reclaimed water.
- Co-leading a statewide working group to develop program evaluation metrics to demonstrate the societal and ecological impacts of UF/IFAS urban water quality extension programs.

Environmental Soil Chemistry and Water Quality Group, *University of Florida Gulf Coast Research and Education Center, Wimauma, FL, 2011 to 2015*

- Doctoral dissertation research supervised by Drs. Gurpal Toor and Patrick Inglett
- Used GIS tools, stable isotopes, and high-resolution mass spectrometry to investigate the origin and environmental fate of organic nitrogen in urban stormwater and streams.
- Successfully authored a grant proposal to acquire instrument time at NSF's National High Magnetic Field laboratory and used advanced instrumentation there to elucidate the molecular character and expected ecological significance of dissolved organic nitrogen in urban waters.
- Resulted in 4 journal publications presently published or in preparation.

Geosciences Department, *Brigham Young University, Provo, UT, 2003-2005*

- Masters research supervised by Dr. Barry Bickmore
- Successfully wrote a \$60,000 NSF grant to conduct research on the role of mentored creative work on the geology content knowledge of undergraduates.
- Resulted in 1 publication in the *Journal of Geoscience Education*.

Clay Mineralogy and Soil Chemistry Lab, Virginia Tech, Blacksburg, VA, 1995-1998

- Masters research supervised by Dr. Lucian Zelazny
- Used clay mineralogy and x-ray diffraction techniques to link soil mineralogy to sulfate adsorption and base cation release in soils.

Environmental Technology Center, Ciba-Geigy Corp., Greensboro, NC, 1994-1995

- Experimentally tested chemical reactions of the Fenton's Reagent for the degradation and remediation of chlorinated organic contaminants in soil and groundwater.
- Resulted in new treatment methods for in-situ remediation of a Superfund site.

Soil Physics Lab, Brigham Young University, Provo, UT 1992-1994

- Provided bench chemistry and gas chromatography assistance in research on the fate and transport of the pesticide atrazine in vadose zone soils.

Publications

Journal Articles – published or recently accepted

1. **Lusk, M. G.**, G. S. Toor, and P. Inglett. 2017. *Characterization of dissolved organic nitrogen in leachate from a newly established and fertilized turfgrass*. Water Research. (In press; manuscript accepted October 2017)
2. **Lusk, M. G.**, G. S. Toor, M. De, S. Mechtensimer, and T. A. Obreza. 2017. *A review of the fate and transport of nitrogen, phosphorus, pathogens, and trace organic chemicals in conventional septic systems*. Critical Reviews in Environmental Science and Technology 47(7):455-541.
3. **Lusk, M. G.** and G. S. Toor. 2016. *Biodegradability and molecular composition of dissolved organic nitrogen in urban stormwater runoff and outflow water from a stormwater retention pond*. Environmental Science and Technology. 50(7):3391-3398.
4. **Lusk, M. G.** and G. S. Toor. 2016. *Dissolved organic nitrogen in urban streams: biodegradability and molecular composition studies*. Water Research. 96:225-235.
5. Adewopo, J. B., R. K. Bhomia, M. Almaraz, A. R. Bacon, E. Eggleston, J. D. Judy, R. W. Lewis, **M. Lusk**, B. Miller, C. Moorberg, E. H. Snyder, M. Tiedeman, and C. VanZomerem. 2014. *Top-ranked priority research questions for soil science in the 21st century*. Soil Science Society of America Journal. 78:337-347.

6. **Lusk M. G.**, B. R. Bickmore, R. Sudweeks, T. Bothell, and E. Christensen. 2006. *Use of a mentored creative writing project to improve the geology education of preservice elementary teachers*. *Journal of Geoscience Education*, 54, 31-40.

Journal Articles – in review or in preparation

1. Yang, Y. and **M. G. Lusk**. 2017. *Nutrients in urban stormwater runoff: current state of the science and potential mitigation options*. (in review, submitted 6 September 2017 to *Current Pollution Reports*)
2. **Lusk, M. G.**, G. S. Toor, and P. W. Inglett. 2017. *Organic nitrogen in residential stormwater runoff: implications for stormwater management in urban watersheds*. (In preparation); target journal: *Water Research*.

Book Chapters

1. **Lusk, M. G.** and G. S. Toor. 2017. *Optimizing the Hydrologic Properties of Urban Soils*. In Lal, R and B. A. Stewart, eds., *Advances in Soil Science: Urban Soils*, CRC Press, Boca Raton, FL.

Book Reviews

1. **Lusk, M. G.** and G. S. Toor. 2012. *Urban Watersheds: Geology, Contamination, and Sustainable Development*. Martin M. Kaufman, Daniel T. Rogers, and Kent S. Murray, editors. *CRC Press, Taylor & Francis Group, Boca Raton, FL*. *Journal of Environmental Quality*, 41:1-2.

Technical Reports

1. Toor, G.S., **M. Lusk**, & T. Obreza. 2011. Onsite sewage treatment and disposal systems: an overview. University of Florida–IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss549>.
2. Toor, G.S., **M. Lusk**, & T. Obreza. 2011. Onsite sewage treatment and disposal systems: nitrogen. University of Florida–IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss550>.
3. **Lusk, M.**, G.S. Toor, & T. Obreza. 2011. Onsite sewage treatment and disposal systems: phosphorus. University of Florida–IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss551>.
4. **Lusk, M.**, G.S. Toor, & T. Obreza. 2011. Onsite sewage treatment and disposal systems: bacteria and protozoa. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss552>.
5. **Lusk, M.**, G.S. Toor, & T. Obreza. 2011. Onsite sewage treatment and disposal systems: viruses. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss553>.

6. Toor, G.S., **M. Lusk**, & T. Obreza. 2011. Onsite sewage treatment and disposal systems: organic contaminants. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss554>.
7. Toor, G.S. & **M. Lusk**. 2011. What's in reclaimed water and where does it go? University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss542>.
8. Toor, G.S. & **M. Lusk**. 2011. Constituents of concern in reclaimed water. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss543>.
9. Toor, G.S. & **M. Lusk**. 2011. Managing salinity, sodicity, and specific ion toxicity in reclaimed water irrigated sites. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss545>
10. Toor, G.S. & **M. Lusk**. 2011. Understanding landscape irrigation water quality tests. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss546>.
11. Toor, G.S. & **M. Lusk**. 2011. Frequently asked questions about reclaimed water. University of Florida– IFAS, Gainesville, FL. <http://edis.ifas.ufl.edu/ss544>.

Other Publications

1. Albertin, A., Atkinson, M., Barrett, C., Dukes, M., M., Fletcher, J., Krinsky, L., **Lusk, M.**, Migliaccio, K., and Warner, L. 2017. “Manual for conducting an urban irrigation audit program.” UF/IFAS Extension. (*in preparation*)
2. “Water in the South Central Extension District: Big Issues Part II.” Published 25 August 2016 at <http://blogs.ifas.ufl.edu/extension/2016/08/25/water-south-central-extension-district-big-issues-part-ii/> .
3. “6 Things You Need to Know About the 2016 Water Bill.” Published 1 July 2016 at <http://blogs.ifas.ufl.edu/extension/2016/07/01/6-things-need-know-2016-florida-water-bill/>
4. “Water in the Extension South Central District: Big Issues Part I.” Published 24 June 2016 at <http://blogs.ifas.ufl.edu/extension/2016/06/24/water-extension-south-central-district-big-issues-part/> .
5. “Water Reuse in the Sunshine State.” Published 19 May 2016 at <http://blogs.ifas.ufl.edu/extension/2016/05/19/water-reuse-sunshine-state/> .
6. Dvorak, B. and **M. G. Lusk**. 2013. *Discover Soils: Green Roofs*. Published online at <https://www.soils.org/discover-soils/soils-in-the-city/green-roofs> .

Conference Presentations-Invited

1. **Lusk, M. G.** and G. S. Toor. *Optimizing the Hydrologic Properties of Urban Soils*. ASA-SSSA-CSSA Annual Meetings Symposium, Nov. 6-9, 2016, Phoenix, AZ.
2. **Lusk, M. G.** 2016. *Just the facts: Laws of Florida 2016-1 (the Water Bill)*. Biscayne Bay Regional Conservation Coordination Meeting, Sept. 21, 2016, Virginia Key, FL.

3. **Lusk, M. G.**, G. S. Toor, and P. W. Inglett. *Molecular-level Characterization of Dissolved Organic Nitrogen in Urban Waters*. 2014. Soil and Water Research Forum, Sept. 18, 2014, Gainesville, FL.
4. **Lusk, M. G** and G. S. Toor. 2013. *Fertilizer Bans in Florida's Urban Landscapes—Does Science Support Policy?* National Pest Management Association Meetings, Jan. 7-9, 2013, Orlando, FL.
5. **Lusk, M. G.**, & G. S. Toor. 2011. *Fate and Transport of Pathogens in Onsite Wastewater Treatment Systems*. ASA-SSSA-CSSA Annual Meetings Symposium, Oct. 16–19 2011, San Antonio, TX.

Conference Presentations-Contributed

1. **Lusk, M. G.** 2017. *What's in Reclaimed Water and Where does it Go?* Florida Stormwater Association Annual Meeting, June 14-16, 2017, Sanibel, FL. (abstract accepted February 2017).
2. **Lusk, M. G.** and J. Hinton. 2017. *Managing Manure Wastes on Small Urban Horse Farms: A Partnership Case Study from Tampa Bay, Florida*. National Urban Extension Conference, May 8-11, Minneapolis, MN. (abstract accepted Nov. 30, 2016).
3. **Lusk, M. G.** 2017. *Nutrient and Bacterial Impairments in Urban Waters: Landscape Scale Solutions and Extension Opportunities*. Urban Landscape Summit, March 16-17, 2017, Gainesville, FL.
4. **Lusk, M. G.**, J. Jarvis, R. Beasley, and G. S. Toor. 2014. *Ultra-high Resolution FTICR Mass Spectrometry for the Molecular-level Characterization of Dissolved Organic Nitrogen in Human-dominated Watersheds*. Geological Society of America International Annual Meetings. Nov 19-23, 2014, Vancouver, British Columbia, Canada.
5. **Lusk, M.** and G. S. Toor. 2013. *Assessing the Influences of Urbanization On Dissolved Organic Nitrogen in Stormwater and a Receiving Stream*. ASA-SSSA-CSSA International Annual Meetings, Nov. 3-6, 2013, Tampa, FL.
6. **Lusk, Mary G.**, and G. S. Toor. 2013. *Teaching Teachers: Soils for Science Education Majors in Both Rural and Urban Communities*. ASA-SSSA-CSSA International Annual Meetings, Nov. 3-6, 2013, Tampa, FL.

7. Lancaster, S. and **Mary G. Lusk**. 2013. *Panel Discussion of Next Generation Science Standards with K-12 Educators*. ASA-SSSA-CSSA International Annual Meetings, Nov. 3-6, 2013, Tampa, FL.
8. **Lusk, M. G.** 2013. *Organic Nitrogen in Urban Stormwater Runoff—Where Does It Come From and Why Should We Worry About It?* Florida Association of Environmental Soil Scientists Annual Meetings, Oct. 6-9, 2013, Tampa, FL.
9. **Lusk, M.** and G. Toor. 2012. *Nitrogen Transport Across an Urbanization Gradient in a Coastal Watershed*. UF Water Institute Symposium, February 15-16, 2012, Gainesville, FL.
10. **Lusk, M.** and G. Toor. 2011. *Nitrogen Concentrations and Forms in Streams Draining Developed and Undeveloped Sub-basins of the Alafia River Watershed*. 2011 GCREC Ag Expo, November 9, 2011, Wimauma, FL.
11. **Lusk M. G.**, B. R. Bickmore, R. Sudweeks, T. Bothell, and E. Christensen. 2003. *The Earth Science Storybook Project: Use of a mentored creative writing project to improve the geology education of preservice elementary teachers*. Geological Society of America Annual Meetings, Nov. 3-5, 2003, Seattle, WA.

Extension Presentations and Teaching

Presentations

1. "Use it again: the state of reclaimed water use in Florida and the nation." Seminar talk at Charlotte County Extension, 13 March 2017.
2. "Water quality challenges and landscape-scale solutions in southwest Florida." Seminar talk at Pinellas County Extension, 16 February 2017.
3. "BMAPs, WUCAs, BMPs, and ESN: The acronyms of Florida's water." Invited talk to the Corn Growers Association, Gulf Coast Research and Education Center, 2 February 2017.
4. "Microirrigation principles for home vegetable gardens." Workshop talk presented at Hardee County Extension, 28 July 2016.

Development and Delivery of Inservice Trainings (ISTs)

1. "Developing evaluation metrics to demonstrate the societal and ecological impacts of county extension programs for urban water quality." UF/IFAS Extension Symposium, State Extension Inservice Training Meeting, April 19, 2017, Gainesville, FL.
2. "How UF/IFAS Extension agents can help implement agricultural best management practices in basin management action plan (BMAP) areas." UF/IFAS Extension Symposium, State Extension Inservice Training Meeting, April 19, 2017, Gainesville, FL.

3. "Advanced treatment options for nitrogen removal in onsite wastewater treatment systems." UF/IFAS Northwestern District Natural Resources Inservice Training Meeting, March 6, 2017, Wakulla, FL.
4. "Behavior of Pathogens in Onsite Wastewater Systems". State Extension Inservice Training Meeting, April 18, 2011, Wimauma, FL.

University, Department, and Professional Service

- Since 2017** Member, Southwest Florida Water Management District (SWFWMD), Agriculture/Green Industries Advisory Committee
- Since 2017** Member, Sustainability Committee, University of Florida Faculty Senate
- 2017** Co-organizer, 1 conference session on urban fertilizer regulations and 1 conference session on manure BMPs for small horse farms, ASA-SSSA-CSSA International Annual Meetings, Tampa, FL.
- Since 2016** Member, UF/IFAS Extension Urban Water Quality Priority Working Group
- Since 2013** Member, K-12 Education Committee, American Society of Agronomy
- 2013** Co-organizer, Panel discussion on incorporating agronomy and soils into K-12 science education, Soil Science Society of America International Annual Meetings, Tampa, FL.
- 2013** Content consultant for *Up On The Roof*, an article on green roof soils. Time Magazine for Kids, April 2013.
- 2012** Member, Working Group Committee to Identify the Top 25 Research Priorities for Soil Science in the 21st Century
- 2012/2013** Graduate Student Representative Vice President, UF Soil and Water Science Department

Funded Research

Role: PI/Co-PI

2016, Woodard and Curran Foundation: Residential Irrigation Audit Manuals for Water Conservation Educators. \$5,384 for one year.

2014, National Science Foundation and the National High Magnetic Field Laboratory: Ultrahigh resolution Fourier transform ion cyclotron resonance mass spectrometry to characterize the molecular composition of dissolved organic nitrogen in urban and nonurban streams. Awarded

instrument time and data analysis at the National High Magnetic Field Laboratory, which grants analytical time and services through an international competitive proposal process

2014, Geological Society of America: High Resolution Mass Spectrometry to Assess the Molecular Character of Dissolved Organic Nitrogen in Urban and Non-urban Streams. \$1,514 for 6 months

2013, Center for Landscape Conservation and Ecology: Assessing Organic Nitrogen Loss from Urban Residential Areas: Implications for Urban Stormwater Management. \$26,825 for one year.

2012, Center for Landscape Conservation and Ecology: Fertilizer Bans in Florida's Urban Landscapes—Does Science Support Policy? \$26,650 for one year.

Role: Senior Personnel

2016, Center for Landscape Conservation and Ecology: Studying Diverse Audiences to Understand the Impact of Landscapes on Communities. \$28,740 for 2 years.

2002, National Science Foundation: The Earth Science Storybook Project: Building Content Knowledge and Teaching Confidence in Preservice Teachers. \$59,876 for 3 years.

Proposals Pending Award Notification

Role: PI/Co-PI

2017, Southwest Florida Water Management District, Evaluation of Water-Use and Water-Quality Effects of Amending Soils and Residential Lawns with Compost Material, \$61,000 for 2 years (submitted 28 April 2017) (Co-PI)

2017, Environmental Protection Commission of Hillsborough County, Small Farms for Clean Water: Compost Education to Promote Manure Best Management Practices on Small Equine Farms, \$15,750 for 1 year (submitted 31 March 2017) (PI)

2017, Indian River Lagoon National Estuary Program, Source and Loads of Surface Water Nutrients from Residential Waterfront Homes in Brevard County, Florida, \$31,900 for one year (submitted 29 May 2017). (Co-PI)

Teaching and Course Development

Campus	Course	Role
U. of Florida	SWS 6932 Urban Soil and Water Systems (online course)	Developer and Instructor
U. of Florida	SWS 3022L Introduction to Soils in the Environment Lab	Instructor
BYU-Provo, UT	PS 110B Physical Geology Lab	Curriculum Developer and Instructor

Virginia Tech	CSES 112 Introductory Soil Science Lab	Instructor
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Awards/Honors

1. Fellow, Natural Resources Leadership Institute (NRLI), 2017
2. Research Proposal of Exceptional Merit, Geological Society of America, 2014
3. Florida Fertilizer and Agrichemical Association Scholarship, 2014
4. Florida Stormwater Association Educational Foundation Scholarship, 2013
5. UF Alumni Foundation Fellowship, 2011-2015
6. Honorable Mention, NSF Graduate Research Fellowship, 2011

Professional Memberships

Soil Science Society of America, since 2011

Florida Association of Environmental Soil Scientists, since 2011

Florida Lake Management Society, since 2012

American Geophysical Union, since 2012

American Water Resources Association, since 2016

Water Reuse Florida, since 2016