

# MARY ELIZABETH FOLTZ

School of Civil and Environmental Engineering | Oklahoma State University  
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## ACADEMIC APPOINTMENTS

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### Assistant Professor

Aug 2, 2021-Present

School of Civil and Environmental Engineering  
Oklahoma State University (OSU), Stillwater, OK

## EDUCATION

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### University of Illinois at Urbana-Champaign (UIUC), Urbana, IL

2021

Doctor of Philosophy, Environmental Engineering  
Advisors: Dr. Julie L. Zilles (director of research), Dr. Jeremy S. Guest (chair)  
Thesis: "Nitrous oxide from denitrification: influence of field management, environmental conditions, and nutrient availability"

### University of Illinois at Urbana-Champaign (UIUC), Urbana, IL

2017

Master of Science, Environmental Engineering  
Advisors: Dr. Julie L. Zilles, Dr. Sotiria Koloutsou-Vakakis  
Thesis: "Nitrous oxide emissions under different corn field managements in the United States"

### Indiana University Bloomington (IUB), Bloomington, IN

2014

Bachelor of Science, Environmental Science  
Advisor: Dr. Greg A. Olyphant  
Thesis: "Geochemical processes involved in a constructed wetland receiving outflow from a sulfate-reducing bioreactor used to treat acid mine drainage"

## AREAS OF EXPERTISE

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### Multiphase Biogeochemistry; Multi-Scale Modeling; Interdisciplinary Investigation

- holistic tracing of biogeochemical contaminant transformations across water and gas phases in engineered and natural systems
- developing and utilizing models across scales from mechanistic to global climate models
- bridging expertise of different disciplines, including environmental engineering, agricultural engineering, and statistics, to approach emerging environmental and societal problems

## SELECT AWARDS AND HONORS

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American Society for Engineering Education Best Paper Award	2021
National Institute of Food and Agriculture Predoctoral Fellowship	2018-20
Civil and Environmental Engineering Trust Fellowship, UIUC	2016-20
American Society of Agricultural and Biological Engineers Presentation Award	2019
Association of Environmental Engineering and Science Professors Poster Award	2017
National Science Foundation Graduate Research Fellowship Honorable Mention	2016, 2017
Tavis Smiley Scholarship, IUB	2012-14
Founder's Scholar, IUB	2011-14

## PUBLICATIONS

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- Foltz, M.E.**, S. Koloutsou-Vakakis. 2021. Can online summer camps work? Evidence from adapting a high school hands-on water quality module for online delivery. American Society for Engineering Education (ASEE) IL-IN Regional Conference, **Best Paper Award**.
- Wickramarathne, N., L.E. Christianson, **M.E. Foltz**, J.L. Zilles, R.D. Christianson, R.A.C. Cooke. 2021. Biological Nitrate Removal with Emerald Ash Borer-killed Ash and High-tannin Oak Woodchips. *Frontiers in Environmental Science - Water and Wastewater Management* 9:648393. Accepted: February 24, 2021. DOI: 10.3389/fenvs.2021.648393.
- Foltz, M.E.**, A.D. Kent, S. Koloutsou-Vakakis, J.L. Zilles. 2021. Influence of non-legume cover cropping on denitrification potential and year-round field N<sub>2</sub>O emissions. *Science of the Total Environment* 765: 144295. Accepted: November 28, 2020. DOI: 10.1016/j.scitotenv.2020.144295.
- Foltz, M.E.**, J.L. Zilles, S. Koloutsou-Vakakis. 2019. Prediction of N<sub>2</sub>O emissions under different field management practices and climate conditions. *Science of the Total Environment* 646: 872-879. Accepted: July 25, 2018. DOI: 10.1016/j.scitotenv.2018.07.364.

## FUNDED PROPOSALS

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- Christianson, L.E. and **M.E. Foltz**. Illinois Water Resource Center grant. "Improving denitrifying woodchip bioreactor design and management through denitrification potential testing." 2019-2020. \$9,968.
- Zilles, J.L., L.E. Christianson, **M.E. Foltz**. National Great Rivers Research and Education Center (NGRREC) grant. "Evaluation of denitrifying bioreactors and wetlands for reducing nitrogen inputs to rivers." 2019. \$6,500.
- Foltz, M.E.** and J.L. Zilles. National Institute of Food and Agriculture (NIFA) Predoctoral Fellowship. "Multiphase Approach to Evaluating and Modeling Passive Treatment Systems for Agricultural Nitrogen Runoff." 2018-2020. \$95,000.
- Zilles, J.L., S. Koloutsou-Vakakis, **M.E. Foltz**. NGRREC grant. "Reducing nitrate inputs to rivers: Modeling performance of denitrifying bioreactors." 2018. \$6,500.
- Zilles, J.L., S. Koloutsou-Vakakis, **M.E. Foltz**. NGRREC grant. "Agricultural nitrogen inputs to rivers: Effects of field management and microbial activity." 2017. \$6,500.
- Zilles, J.L., S. Koloutsou-Vakakis, **M.E. Foltz**. NGRREC grant. "Effects of agricultural management practices on nitrogen inputs to great rivers." 2016. \$6,500.

## ORAL PRESENTATIONS (PRESENTER UNDERLINED)

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- Foltz, M.E.**, S. Koloutsou-Vakakis. "Can online summer camps work? Evidence from adapting a high school hands-on water quality module for online delivery." American Society for Engineering Education (ASEE) IL-IN Regional Conference, Virtual, April 2021.
- Foltz, M.E.** "Factors driving N<sub>2</sub>O ratios in soils: a meta-analysis." Environmental Engineering and Science (EES) Seminar, UIUC, February 2021.
- Foltz, M.E.**, N. Wickramarathne, J.L. Zilles, L.E. Christianson. "Bioreactor woodchips provide high potential for complete denitrification." American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting, Virtual, July 2020.
- Foltz, M.E.**, S. Koloutsou-Vakakis, J.L. Zilles. "Cover cropping effects on denitrification and nitrous oxide production from Illinois corn." EES Seminar, UIUC, September 2019.
- Foltz, M.E.**, J.L. Zilles, S. Koloutsou-Vakakis. "Influence of cover cropping on year-round measured and modeled N<sub>2</sub>O emissions." ASABE Annual International Meeting, Boston, MA, July 2019. **5<sup>th</sup> place Student Presentation Award**.

- Foltz, M.E.**, S. Koloutsou-Vakakis, J.L. Zilles. "Influence of cover cropping on year-round field N<sub>2</sub>O emissions and denitrification potential." Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference, Tempe, AZ, May 2019.
- Foltz, M.E.** "Influence of precipitation and irrigation on agricultural N<sub>2</sub>O flux predictions." EES Seminar, UIUC, February 2018.
- Foltz, M.E.** "Evaluation of the Denitrification Decomposition (DNDC) model for agricultural nitrous oxide emissions in the United States." EES Seminar, UIUC, March 2017.
- Nicholas, M.E.** "Geochemical Processes involved in a Constructed Wetland Receiving Outflow from a Sulfate-Reducing Bioreactor Used to Treat Acid Mine Drainage." Undergraduate Research Symposium, IUB, May 2014.

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POSTER PRESENTATIONS (PRESENTER UNDERLINED, \*UNDERGRADUATE MENTEE)

- Foltz, M.E.**, S. Koloutsou-Vakakis, J.L. Zilles. "Cover crops decrease N<sub>2</sub>O emissions via changes in soil nitrogen." Association of Environmental Engineering and Science Professors (AEESP) Distinguished Lecture Conference, Purdue University, West Lafayette, IN, February 2020.
- Krueger, L.\***, **M.E. Foltz**, L.E. Christianson, J.L. Zilles. "Evaluation of denitrifying bioreactors for reducing nitrogen inputs to rivers from agricultural fields." National Great Rivers Research and Education Center (NGRREC) Intern Symposium, Godfrey, IL, July 2019.
- Majumdar, T.\***, **M.E. Foltz**, S. Koloutsou-Vakakis, J.L. Zilles. "Reducing nitrate input to rivers: Modeling performance of passive treatment systems." NGRREC Intern Symposium, Godfrey, IL, July 2018.
- Foltz, M.E.**, J.L. Zilles, S. Koloutsou-Vakakis. "Influence of precipitation and irrigation on nitrous oxide flux predictions from US corn." (1) AEESP Distinguished Lecture Conference, Purdue University, West Lafayette, IN, January 2018. (2) Civil and Environmental Engineering Visiting Day, UIUC, March 2019.
- Zilles, J.L.**, S. Koloutsou-Vakakis, A.D. Kent, Y. Ma, **M.E. Foltz**. "Nitrogen emissions associated with nutrient management practices: measurements, modeling, and microbial communities." (1) Agricultural and Food Research Initiative (AFRI) and the National Integrated Water Quality (NIWQP) Project Directors Meeting, January 2018. (2) College of Engineering Research Fair, UIUC, September 2018.
- Koerner, C.M.\***, **M.E. Foltz**, Y. Ma, S. Koloutsou-Vakakis, J.L. Zilles. "Rye cover cropping and fertilization effects on microbial activity and nitrogen emissions." NGRREC Intern Symposium, Godfrey, IL, July 2017.
- Foltz, M.E.**, J.L. Zilles, S. Koloutsou-Vakakis. "Model evaluation of agricultural nitrous oxide emissions under different field managements." AEESP Research and Education Conference, Ann Arbor, MI, June 2017. **Best Poster Award.**
- Ma, Y.**, **M.E. Foltz**, T.D. Alston, S. Koloutsou-Vakakis, A.D. Kent, J.L. Zilles. "Impact of agricultural nutrient management practices on nitrous oxide emissions and microbial communities." AEESP Research and Education Conference, Ann Arbor, MI, June 2017.
- Chu, T.\***, **M.E. Foltz**, J.L. Zilles, S. Koloutsou-Vakakis. "Modeling Agricultural N<sub>2</sub>O Emissions." Promoting Undergraduate Research Experiences Symposium, UIUC, December 2016. **Best Poster Award.**
- Zilles, J.L.**, S. Koloutsou-Vakakis, A.D. Kent, Y. Ma, **M.E. Foltz**, T.D. Alston. "Nitrogen emissions associated with nutrient management practices: measurements, modeling, and microbial communities." Agricultural and Food Research Initiative (AFRI) and the National Integrated Water Quality (NIWQP) Project Directors Meeting, October 2016.
- Marques, L.\***, **M.E. Foltz**, J.L. Zilles. "Effects of agricultural management practices on nitrogen inputs to great rivers." NGRREC Intern Symposium, Godfrey, IL, August 2016.

## TEACHING AND MENTORING EXPERIENCE

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### Instructor

- CIVE 3813 Environmental Engineering Science, OSU Fa 2021
- 3 credit hours, lecture, 25 students

### Guest Lecturer

- CPSC 112 Intro to Crop Sciences, UIUC 2019
- “Photosynthesis, Respiration, and Light”, 1.5 h lecture, 100 students
- CEE 444 Biological Principles, UIUC 2018
- “Photosynthetic Growth”, 1.5 h lecture, 30 students
- ENG 198 Special Topics – Research, UIUC 2018
- “Research in Environmental Engineering and Science”, 0.5 h lecture, 10 students
- CEE 548 Scientific Writing, UIUC 2017
- Expert reviewer for research proposals

### High School Teacher, Neighbors’ New Vistas High School, Portage, IN 2014-15

- Developed curricula and taught biology, earth and space science, integrated chemistry and physics, and environmental science to high school students in a public charter school
- Organized school science fair, outreach event, standardized test preparation day, Museum of Science and Industry field trip, and Lake Michigan water quality lab field trip

### Mentor

- National Great Rivers Research and Education Center (NGRREC) program
- Laura Krueger, Biological and Agricultural Engineering Su 2019
  - Tanvi Majumdar, Natural Resources and Environmental Science Su 2018
  - Christy Koerner, Environmental Science Su 2017
  - Laís Marques, Environmental Engineering Su 2016
- Research Experiences for Undergraduates (REU) program, UIUC
- Allen Peng, Civil and Environmental Engineering Sp 2018
  - Meijun Liu, Civil and Environmental Engineering Su, Fa 2017
- Promoting Undergraduate Research Experiences (PURE) program, UIUC
- Tiffany Chu, Biochemistry Fa 2016
- Other programs (non-research related)
- Clean Water Science Network 2020-21
  - Illinois Promise Scholar, UIUC 2020-21
  - Mentoring Undergraduates in Science and Engineering (MUSE), UIUC 2020
  - Mentor Collective, Indiana University 2018-19
  - Environmental Engineering and Science Buddies, UIUC 2017-18

### Outreach Instructor

- Worldwide Youth in Science and Engineering (WYSE) Program Virtual summer camp
- “Water Quality and Treatment”, two 1.5 h Zoom lectures, 40 students each 2020
- Girls’ Adventures in Math, Engineering and Sciences (GAMES) summer camp
- “Nitrogen Cycle” and “Environmental Measurements” modules, 4 h, 20 students 2017
  - “Water Quality” and “Water Treatment” modules, 8 h, 20 students 2016-17

## WORKSHOPS & IMPROVEMENT ACTIVITIES

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14-day writing challenge, National Center for Faculty Development and Diversity, 14 h	2021
Emerging contaminants in water and wastewater short course, Marquette University, 6 h	2020
Junior faculty teaching and learning seminar series, UIUC, 7.5 h	2019
Cultural Awareness and Speaking Enhancement, UIUC, member and chair ('17), 70 h	2016-18
Strategies, tools, and tips for teaching workshop, AEESP Conference, 2.5 h	2017
GIS for research workshop series, UIUC, 6 h	2016

## CERTIFICATIONS

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Foundations of Teaching, Center for Innovation in Teaching and Learning (CITL), UIUC	2020
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## SERVICE

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<i>Reviewer</i> , Science of the Total Environment	2021
<i>Reviewer</i> , Water Research	2020-21
<i>Instructor</i> , WYSE Virtual Summer Camp, UIUC	2020
<i>Judge</i> , Undergraduate Research Symposium, UIUC	2020
<i>Reviewer</i> , USGS Water Resources Research Grant Pre-Proposals	2019
<i>Presenter</i> , LaSalle County Farm Bureau Field Day	2019
<i>Exhibitor</i> , Illinois Sustainable Ag Partnership Livingston County Conservation Field Day	2018
<i>Engineer Volunteer</i> , Engineer in the Classroom, UIUC	2018
<i>Chair</i> , Cultural Awareness and Speaking Enhancement, UIUC	2017
<i>Graduate Co-coordinator</i> , GAMES Summer Camp, UIUC	2015-17
<i>Master of Ceremonies</i> , <i>Safety &amp; Secrecy Committee Chair</i> , Alpha Chi Sigma, IUB	2013-14

## PROFESSIONAL MEMBERSHIPS

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American Society for Engineering Education	2020-Present
American Society of Agricultural and Biological Engineers	2019-Present
Association of Environmental Engineering and Science Professors	2016-Present
Alpha Chi Sigma, Professional Chemistry Fraternity	2012-14