

Marika Nell

220 Hollister Hall, Ithaca, NY 14853
(301) 675-9960 • mrn62@cornell.edu
<https://www.linkedin.com/in/marikanell/>

EDUCATION

Ph.D. in Civil & Environmental Engineering Aug 2014 – Present
M.S. in Civil & Environmental Engineering Complete Aug 2018
Cornell University GPA: 4.00
Dissertation Topic: “Assessing the Water Quality Impacts of Hydraulic Fracturing Wastewaters: Detecting Semi-polar to Polar Organic Contaminants in Hydraulic Fracturing Associated Waters and Estimating their Ecological Risk”
Committee: Louis Derry, Anthony Hay, Damian E. Helbling (Chair)
Concentrations: Environmental Processes, Environmental Toxicology, and Applied Geochemistry

B.S. in Civil Engineering with Highest Honors Aug 2010 – May 2014
University of Illinois Urbana-Champaign GPA: 3.93
Minor in Environmental Economics and Law

WORK EXPERIENCE

Doctoral Researcher with Prof. Damian Helbling Aug 2014 – Present
School of Civil and Environmental Engineering, Cornell University

- Conducts laboratory experiments and computational research to examine the water quality impacts of hydraulic fracturing (a.k.a. “fracking”) fluids and wastewaters
- Employs liquid chromatography high-resolution mass spectrometry (LC-HRMS) to identify chemical additives to hydraulic fracturing fluid using conventional data processing as well as suspect and nontarget screening workflows
- Contributes to the US Environmental Protection Agency’s Non-Targeted Analysis Collaborative Trial, an international research trial which sought to evaluate the ability of nontarget screening methods to consistently and accurately identify unknown chemicals in environmental samples
- Collaborates with Prof. Robert Oswald (Dept. of Molecular Medicine) and Prof. Anthony Hay (Dept. of Microbiology) to produce interdisciplinary work on the toxicity of fracking compounds

Undergraduate Researcher with Prof. Timm Strathmann Sept 2012 – Dec 2013
Department of Civil & Environmental Engineering, University of Illinois Urbana-Champaign

- Conducted laboratory experiments to study the transformation 17- α -ethynlestradiol (a common birth control active ingredient) during water treatment
- Utilized high performance liquid chromatography and liquid chromatography mass spectrometry to assess and identify transformation products formed during the reaction of 17- α -ethynlestradiol with potassium permanganate

Undergraduate Researcher with Prof. Heileen Hsu-Kim May 2013 – Aug 2013
Department of Civil & Environmental Engineering, Duke University

- Synthesized nanoscale zerovalent iron based on multiple procedures derived from literature
- Conducted experiments to investigate to potential of nZVI to remediate brominated flame retardant, tetrabromobisphenol, a known endocrine disruptor

Environmental Health and Industrial Hygiene Intern May 2012 – Aug 2012
Safety and Mission Assurance Division (Code 300), NASA Goddard Space Flight Center

- Inspected laboratories and other NASA Goddard Facilities to ensure OSHA compliance with professional industrial hygienists
- Compiled reports and implemented the MedGate database to accurately track the history and progress of reports
- Calibrated monitoring instruments such as multi-gas detectors and photoionization detectors

SELECTED HONORS

National Science Foundation Graduate Research Fellow	2014
Ira O. Baker Prize	2014
Udall Scholar	2013

SELECTED AWARDS

SPARK Talks Certificate of Scholarship	2018
People's Choice Award for Poster Presentation	2018
Cornell Graduate School Conference Travel Grant	2016
Second Place at Poster Pitch Competition	2015
Fred S. Bailey Leadership Award	2014
Fred S. Bailey Scholar	2012, 2013
James Scholar	2010-2014

LEADERSHIP EXPERIENCE

President, Vice President, and Liaison to Alumnae Aug 2016 – Present
Graduate and Professional Women's Network (GPWomeN), Cornell University

- Coordinated an executive board of nine women to create professional development programming and social events for graduate women
- Applied for and secured **\$3000 in funding** from the Graduate and Professional Student Assembly and the President's Council of Cornell Women (PCCW)
- Recruited alumnae speakers and facilitated a five part GPWomeN-PCCW Speaker Series in 2018 to 2019, with over 90 students attending each event to date
- Created a network of all women's graduate organizations at Cornell and facilitated biannual meetings to promote collaboration across the university

President, Vice President, and Research Symposium Chair Aug 2014 – May 2018
Civil & Environmental Engineering (CEE) Graduate Student Association, Cornell University

- Coordinated with a board of ten graduate students to oversee and implement professional development workshops, a student and faculty seminar series, the annual CEE research symposium and other events to enhance the graduate student experience
- Planned and implemented the Seventh Annual Research Symposium, which featured 20 presentations and was attended by over 95 people
- Oversaw an annual budget of \$10,000 and secured an additional \$1,500 in funding
- Served as a liaison between concerned students and administration to address concerns about student life and department culture

Chair, Vice Chair, and Water Working Group Chair Aug 2011 – May 2014
Student Sustainability Committee, University of Illinois Urbana-Champaign

- Lead all meetings and organized events on behalf of the committee, a group of ten students advised by eleven faculty and staff that allocates approximately \$1.1 million per year from campus “green fees” to projects dedicated to sustainability
- Oversaw and approved the allocation of **\$4.68 million** in green fee funds as Chair for 2.5 years
- Coordinated collaboration between faculty, university administrators, university staff, and student leaders to seek out potential projects and bring about institutional change, such as the addition of a **20 acre solar farm** that now provides 2% of campus energy
- Helped shape campus sustainability initiatives as a student member campus committees include: the Chancellor’s Sustainability Council, the steering committee of the Center for a Sustainable Environment (CSE), the search committee for the Director of CSE, the Housing Sustainability Council, and the Academic Facilities Maintenance Fund Assessment Committee
- Reviewed applications, interviewed candidates, and provided feedback on each candidate as a member of the search committee for the Program Advisor position

Project Co-Lead and Project Development Committee Co-Chair Jan 2013 – May 2014
Engineers Without Borders, University of Illinois Urbana-Champaign

- Lead the Soppo Likoko Electrification Project, a team of undergraduate students advised by a professional engineer, who worked to bring electricity to the community of Soppo Likoko, Cameroon so that a health clinic could be built in the town
- Coordinated a **two-week assessment trip to Cameroon** in January 2014
- Worked with community partners to conduct surveys of the residents assess the needs of the town and the feasibility of the project
- Assessed existing infrastructure and met with local technical experts
- Communicated with seven professional mentors, two nonprofit organizations, and community partners to ensure project success

Project Lead and Research Lead Aug 2010 – May 2014
Oglala Lakota Water Project, University of Illinois Urbana-Champaign

- Designed a water filter that used charred bone to remove uranium from contaminated well water on the Pine Ridge Indian Reservation in South Dakota with a team of undergraduate students
- Designed and implemented flow-through experiments to test for arsenic and uranium removal
- Won the EPA’s P3 Phase II Grant, a **\$75,000** grant awarded to six projects nationwide in 2011
- Won 2nd place in the national Environmental Student Design Competition hosted by the Water and Environment Federation

TEACHING AND OUTREACH

GRASSHOPR Fellow Jan 2016 – Present
Graduate Student School Outreach Program (GRASSHOPR), Cornell University

- Designed, coordinated, and taught a four part mini-course on water and environmental engineering to elementary school classes, teaching **20-24 students annually**
- Tailored curriculum to fit the needs of each classroom and devised five lesson plans covering the water cycle, water treatment and monitoring, nonpoint source pollution, and flood prevention
- Created and implemented an interactive hands-on activity for each lesson to reinforce concepts

Guest Instructor

July 2018

CURIE Academy, Cornell University

- Coordinated and taught a lesson on water use, conservation, and the role of environmental engineering to 48 female high school students
- Designed and implemented an interactive lesson that allowed each student to examine their physical and virtual water footprint and the most effective ways to reduce their water consumption

Volunteer/Exhibitor

Apr 2015

Big Red Barn Science Day, Cornell University

- Taught children ranging from ages 5 to 12 about DNA during a science outreach event
- Demonstrated and assisted children in performing DNA extraction on strawberries using a simple procedure with visible and tangible results

PEER-REVIEWED PUBLICATIONS

2. **Nell, M.** and D. E. Helbling. (2018). Exploring Matrix Effects and Quantifying Organic Additives in Hydraulic Fracturing Associated Fluids using Liquid Chromatography Electrospray Ionization Mass Spectrometry. *Environmental Science: Processes & Impacts*. DOI: 10.1039/C8EM00135A

1. Oetjen, K., Giddings, C. G., McLaughlin, M., **Nell, M.**, Blotvogel, J., Helbling, D. E., ... and C. P. Higgins. (2017). Emerging Analytical Methods for the Characterization and Quantification of Organic Contaminants in Flowback and Produced Water. *Trends in Environmental Analytical Chemistry*, 15, 12-23.

OTHER PUBLICATIONS

2. **Nell, M.** (2018). Energy Policy Challenges for a Secure North America. Rapporteur's Summary. The Aspen Institute Congressional Program. Vancouver, Canada.

1. **Nell, M.** (2017). Energy for America: Opportunities, Challenges, and Solutions. Rapporteur's Summary. The Aspen Institute Congressional Program. Oslo, Norway. ISBN: 0-89843-669-9.

CONFERENCE PRESENTATIONS

9. **Nell, M.** and D. E. Helbling. Exploring Matrix Effects and Quantifying Organic Additives in Hydraulic Fracturing Associated Fluids using Liquid Chromatography Electrospray Ionization Mass Spectrometry. Shale Gas Network Workshop. State College, PA. May 18, 2018. Poster.

8. **Nell, M.** and D. E. Helbling. Detecting Organic Chemical Additives Throughout the Hydraulic Fracturing Life Cycle: An Examination of Matrix Effects on Detection and Quantification Using Liquid Chromatography High-Resolution Mass Spectrometry. Shale Gas Network Workshop. State College, PA. May 18, 2017. Oral.

7. **Nell, M.** and D. E. Helbling. Developing Novel Analytical Methods for the Detection and Identification of Polar to Semi-polar Chemical Additives in Hydraulic Fracturing Fluids. Shale Gas Network Workshop. State College, PA. May 19, 2016. Poster.

6. **Nell, M.** and D. E. Helbling. Non-target Screening for Polar to Semi-polar Organic Compounds in Hydraulic Fracturing Fluids. American Chemical Society 252nd National Meeting. Philadelphia. August 21, 2016. Oral.

5. **Nell, M.**, Llewellyn, B., Blake, M., Marcinkevicius, A., and N. Benson. The Use of Bone Charcoal and Zerovalent Iron for Removal of As and U from Groundwater on Pine Ridge Reservation. USEPA's National Sustainable Design Expo. Washington D.C. April 20-21, 2013. Poster.
4. **Nell, M.**, Becraft, J., Llewellyn, B., Bollinger, D., and D. Mosiman. The Use of Bone Charcoal and Zerovalent Iron for Removal of As and U from Groundwater on Pine Ridge Reservation. USEPA's National Sustainable Design Expo. Washington D.C. April 7-8, 2012. Poster.
3. Becraft, J., Freeck, J. Genchanok, Y., and **M. Nell**. Use of Bone Char for the Removal of Arsenic and Uranium from Groundwater at the Pine Ridge Reservation. Water and Environment Federation's Technical Exhibition and Conference. Los Angeles. October 16, 2011. Oral.
2. Llewellyn, A., Parker, K., Becraft, J., van Dam, E., Genchanok, J., **Nell, M.**; and E. Steege. Using Bone Charcoal for Removal of As and U from Groundwater on Pine Ridge Reservation. EPA's National Sustainable Design Expo. Washington D.C. April 16-17, 2011. Poster.
1. Becraft, J., Parker, K.; **Nell, M.**, and E. van Dam. Bone Char Filtration for Arsenic and Uranium Removal. The Central States Water and Environment Association's Annual Conference. Madison, WI. April 3, 2011. Oral.

CORNELL PRESENTATIONS

10. **Nell, M.** and D. E. Helbling. What's In Fracking Wastewater? Unconventional Analytical Chemistry for Assessing Contaminants from Unconventional Gas Operations. Environmental Processes Seminar. Ithaca, NY. November 12, 2018. Oral Presentation.
9. **Nell, M.** The Impacts of Fracking: Diversifying Our Understanding of Water Contamination Using Environmental Forensics. Scholars Present About Research & Knowledge (SPARK) Talks. Ithaca, NY. October 18, 2018. Oral Presentation. Awarded Certificate of Scholarship.
8. **Nell, M.** and D. E. Helbling. Exploring Matrix Effects and Quantifying Organic Additives in Hydraulic Fracturing Associated Fluids Using Liquid Chromatography Electrospray Ionization Mass Spectrometry. Tenth Annual Civil & Environmental Engineering Graduate Research Symposium. Ithaca, NY. March 23, 2018. Poster Presentation. Awarded People's Choice for Poster Presentation.
7. **Nell, M.** and D. E. Helbling. Measuring Organic Fracking Chemicals Across Matrices: Developing Analytical Methods for Quantification of Contaminants Throughout the Hydraulic Fracturing Life Cycle. Environmental Processes Seminar. Ithaca, NY. November 20, 2017. Oral Presentation.
6. **Nell, M.** and D. E. Helbling. Detecting Toxic Fracking Chemicals: Challenges of Tracking Additives Through the Fracking Life Cycle. Civil & Environmental Engineering Graduate Student Seminar Series. Ithaca, NY. November 15, 2017. Oral Presentation.
5. **Nell, M.** and D. E. Helbling. Detecting Toxic Fracking Additives: Quantitative Analysis of Hydraulic Fracturing Chemical Additives. Ninth Annual Civil & Environmental Engineering Graduate Student Association Research Symposium. Ithaca, NY. March 24, 2017. Oral Presentation.

4. **Nell, M.** and D. E. Helbling. What's in Fracking Fluid? Using Environmental Forensics to Identify Organic Chemical Additives. Civil & Environmental Engineering Graduate Student Seminar Series. Ithaca, NY. February, 23, 2017. Oral Presentation.
3. **Nell, M.** and D. E. Helbling. Detecting Polar to Semi-polar Organic Compounds in Hydraulic Fracturing Fluids. Environmental Processes Seminar Series. Ithaca, NY. November 14, 2016. Oral Presentation.
2. **Nell, M.,** Sabo, G., Hay, A., and D. E. Helbling. Detecting Toxic Chemicals in Fracking Fluids and Wastewaters. Atkinson Center for a Sustainable Future Post Pitch Competition. Ithaca, NY. October 28, 2016. Poster Presentation. Awarded Second Place.
1. **Nell, M.** and D. E. Helbling. Analyzing Chemical Additives to Hydraulic Fracturing Using Liquid Chromatography-High Resolution Mass Spectrometry (LC-HRMS). Environmental Processes Seminar. Cornell University, Ithaca, NY. November 23, 2015. Oral Presentation.

TRAINING AND PROFESSIONAL ENRICHMENT

Intergroup Dialogue Project Graduate Course

Jan 2019

Cornell University, Ithaca, NY

- Attended a five-part workshop to build consciousness about social identity, oppression and privilege and the effects of social inequality at personal, interpersonal, and structural levels
- Explored conflict styles and practiced using the LARA Method to engage in productive dialogues and promote conflict resolution

Congressional Policy Pitch Trip

Nov 2018

Advancing Science and Policy, Washington, D.C.

- Met with congressional staff and members of Congress to discuss the water quality impacts of hydraulic fracturing and propose legislative solutions to environmental problems
- Met with representatives of Bayer Strategic Consulting, the Union of Concerned Scientists, and the American Association for the Advancement of Science to discuss how scientists can effectively advocate for policy change

ComSciCon-Cornell

July 2018

Cornell University, Ithaca, NY

- Attended a two day workshop to receive training on effective scientific communication including developing a narrative, navigating dialogues on controversial topics, using a multimedia approach, and communication with reporters/policy makers
- Drafted and revised a scientific blog post after receiving feedback from the Director of Science Content, Services and Programming for WSKG, a public media institution

NSF Graduate Fellowship Leadership Training Program

June 2018

Worcester Polytechnic Institute, Worcester, MA

- Attended a three day workshop which trained NSF GRFP fellows to pursue academic leadership by building skills in conflict management, interpersonal communication, and emotional intelligence
- Assessed my personality type to generate an awareness of how I work best and how I can adapt to work better with those around me
- Discussed diversity and inclusion within teams and how to improve organizational leadership to facilitate participation of all members

PROFESSIONAL AFFILIATIONS

- American Chemical Society
- American Association for the Advancement of Science
- Society of Women Engineers
- Chi Epsilon

VOLUNTEER ACTIVITIES

- Girl Scout Gold Award Recipient (2010) and Lifetime Member of the Girl Scouts of America
- Fostered special-needs dogs for Cayuga Dog Rescue (2014-2018)
- Mentored undergraduate students through Graduate Women in Science (2016)