

LORI A. HAN

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Mission Statement: to provide excellence in teaching for creating a highly qualified future workforce and to provide significant research contributions in addressing some of the world's most pressing environmental challenges using the wisdom embodied in nature-based solutions for water resource management.

EDUCATION

University of Minnesota, College of Food, Agricultural and Natural Resource Sciences – St. Paul, MN

* *PhD Bioproducts and Biosystems Science, Engineering and Management* * 2018

* *MS Water Resources Science with a Minor in Geographic Information Science* * 2012

* *BS Fisheries, Wildlife and Conservation Biology (Wildlife Emphasis)* * 2010

CURRENT ROLE

University of Oklahoma – Norman, OK (August 2023 - current)

Gallogly College of Engineering, School of Civil Engineering and Environmental Science

➤ **Assistant Professor, Director – Han NBS Lab; Affiliate – Center for Restoration of Ecosystems and Watersheds (CREW); Affiliate - Institute for Resilient Environment and Energy Systems**

- Providing research-related input and mentoring to graduate and undergraduate students
- Teaching upper level undergraduate and graduate courses
 - CEES 5263 Fundamentals and Applications of Nature-Based Solutions, Spring Semesters
 - CEES 5020 GIS and Remote Sensing for Water Resources, Fall Semesters
 - CEES 4324/5324 Environmental Biology and Ecology, Fall Odd Year Semesters
- Conducting field, lab, and computer-based research related to water quality and quantity
- Writing proposals for internal and external research and student funding
- Writing peer-reviewed research articles for scholarly journal publication

TEACHING EXPERIENCE

Torah Academy of Minnesota – St. Louis Park, MN (February 2022 – August 2023)

➤ **6th Grade Math and Science Instructor, Multi-Tiered System of Support Coordinator, and Math Interventionist**

- Provided classroom math and science instruction in a unique cultural setting
- Created math and science curricula to supplement provided materials and recommended lessons
- Assisted elementary students struggling in their regular math class using math interventions in the form of pull-outs
- Coordinated reading and math intervention placement and progress based on tri-annual standardized testing
- Authored a new teacher's manual based on my recent experience as a new general studies teacher

WizEducators – Edina, MN (Dec. 2021 - March 2022)

➤ **Academic Tutor (contract)**

- Provided middle and high school math students with assistance related to their coursework (assignments, tests, projects, etc.)
- Assisted middle school students with preparing for standardized tests (quantitative, verbal, reading, and essays)

St. Paul Public Schools – St. Paul, MN

➤ **Literacy Tutor (Oct. 2012 - June 2013)**

- Worked 1-on-1 and cross culturally teaching 2nd and 3rd grade students how to read in an in-school setting
- Engaged students in games and activities designed to assist children in reading

City of Minneapolis – Minneapolis, MN

➤ **Naturalist (July 2010 - July 2011)**

- Led school-age, family and adult groups through various natural resource education programs and tours
- Performed plant and animal surveys and monitoring for contribution to the garden's ongoing inventory catalog
- Created educational material for display in the visitor center

RESEARCH EXPERIENCE

Department of Bioproducts and Biosystems Engineering (BBE): University of Minnesota – St. Paul, MN

- **Ph.D. Fellow, Project: Nutrient Removal using Novel Bioreactor Media (Sept. 2014 – Feb. 2018)**
 - Engineered a large-scale laboratory apparatus to test for nutrient removal from agricultural drainage
 - Designed and conducted a complex water quality research experiment using novel bioreactor configurations
 - Performed statistical analysis of water quality data in SPSS and Excel to determine nitrate removal
 - Advised and supervised undergraduate and graduate students in planning and conducting water quality research
 - Operated as project manager (developing work plans, documenting progress, technical research, budget management)
 - Created technical communications for academic and professional audiences, including Powerpoint presentations and site tours
 - Educated farmers and other stakeholders about agricultural BMPs and bioreactors at numerous outreach events
 - Co-authored the MDA Ag. BMP Handbook for Minnesota, 2nd Ed (Lenhart et al., 2017)
- **Graduate Research Assistant, Project: Mycoalgae for Water Treatment (July 2017 – Jan. 2018)**
 - Engineered a portable paddlewheel system to test for nutrient removal from wastewater using fungi
 - Conducted on-site paddlewheel experiments to determine field feasibility of a laboratory developed fungi
- **Research Fellow, Project: Assessment of the Mullenbach Two-Stage Ditch (July 2010 – Aug. 2014)**
 - Installed flumes and stage recording equipment for determining water balance within the ditch
 - Performed longitudinal profile surveys to determine sediment transport for assessing geomorphic character
 - Collected and statistically analyzed water samples for nitrates to assess in-stream denitrification capabilities
 - Designed and conducted riparian vegetation surveys for biotic assessment
 - Designed, conducted, lab tested and statistically analyzed soil samples for denitrification potential
 - Supervised an undergraduate research assistant in conducting field work and performing lab analyses
- **Research Fellow, Project: Side Inlets to Improve Agricultural Water Quality (Sept. 2013 – July 2014)**
 - Created stage-discharge relationships in Excel to assess the hydraulics of various side inlet designs
 - Designed, assessed, and compared the performance of alternative side inlets using SEDCAD
 - Performed project management duties (organized meetings, facilitated communications, budget assistance)
- **Research Fellow, Project: Assessment of Agricultural Drainage Benefits (Sept. 2013 – July 2014)**
 - Performed an economic analysis of alternative methods of assigning monetary benefits to agricultural lands
 - Performed project management duties (organized meetings, facilitating communications, budget assistance)
- **Research Fellow, Project: Prioritization of Sentinel Watersheds (April 2011 – June 2013)**
 - Created a model in Excel using ArcGIS data to prioritize watersheds for monitoring across the state of MN
 - Organized, created and presented project updates containing technical information to a multi-agency board
 - Organized two large stakeholder workshops to obtain feedback, facilitate communication and present results
 - Wrote quarterly progress reports for the Minnesota Department of Agriculture
 - Supervised an undergraduate research assistant in workshop event organization and preparations
 - Model was used to aid in the first round of watershed selection in BWSR's 1 Watershed, 1 Plan process

Department of Entomology: University of Minnesota – St. Paul, MN

- **Graduate Research Assistant, Project: Stenotherms in Groundwater-fed Streams (Aug. 2010 – May 2012)**
 - Created regression models in Excel to estimate the possible future effects of climate change on trout habitat
 - Modeled and analyzed landscape attributes in ArcGIS to determine which variables affect stream temperature
 - Aided in sampling brown trout and aquatic invertebrates to assess biotic health

Department of Fisheries, Wildlife, and Conservation Biology: University of Minnesota – St. Paul, MN

- **Undergraduate Research Assistant, Project: Waterbird Nesting in the Great Lakes (Sept. 2009 – Aug. 2010)**
 - Performed waterbird counts from aerial photographs using ArcGIS to estimate Lake Superior populations
 - Created maps of waterbird nests sites in ArcGIS for use in publication (Wires & Cuthbert, 2010)
 - Performed ground counts of nesting waterbirds in the Twin Cities area for estimating local populations

RELATED EXPERIENCE

Edit911 – Oviedo, FL (Sept. 2021 - current)

- **Academic Editor (contract)**
 - Editing various academic works for citation style, structure, clarity, grammar, spelling, syntax and punctuation

PROFESSIONAL EXPERIENCE

Houston Engineering, Inc. – Maple Grove, MN

- **Scientist II (Feb. 2018 – Mar. 2021)**
 - Conducted conservation watershed planning using hydrologic data, ArcGIS, PTMApp and other propriety GIS tools and models
 - Assessed the impacts of conservation practices on watershed hydrographs using ArcGIS and PyCharm
 - Organized and conducted conservation workshops for farmer-led conservation groups
 - Performed field work to collect riparian sediment samples and assess the sediment balance on degraded riverbanks in W MN
 - Used third party sustainability assessment software programs to track key sustainability metrics for dairy farms in WI
 - Developed and implemented a framework for creating and growing farmer-led conservation groups
 - Worked with WDs and SWCDs on regulatory and comprehensive watershed planning processes
 - Executed project management activities including managing tasks, timelines, budgets and workloads
 - Provided technical training and oversight to new staff within the water quality business sector
 - Developed QAQC and internal user manuals for various tools and processes related to data analysis
 - Served as Agribusiness Coordinator to facilitate engagement with private industry as conservation partners
 - Wrote final project reports, technical memos and contributed technical content to state 1W1P, TMDL and WRAPS reports

COMPUTER SKILLS

- **Software:** ArcGIS 10.5 - 10.7 and ArcPro; Microsoft Office 365 Suite; Macintosh Pages, Safari, and Mail; Pycharm; PTMApp; SWAT; FLUX32; BATHTUB; MAPWINDOW; ERDAS Imagine; SEDCAD; HEC-RAS, HEC-HMS; XLSTAT; SPSS

TECHNICAL SKILLS

- Use of a laser level to take profile measurements; field site reconnaissance, sediment sampling and habitat assessments; Rosgen BANCS and BEHI models; set-up and use of water stage recording equipment (flumes, pressure transducers); use of water quality monitoring equipment (YSI Sonde, Hach Nitratax Nitrate Probe, DR890 Phosphorus Colorimeter); CR10X data logger set-up and troubleshooting; technical proposal writing in response to grant RFPs

RELATED COURSEWORK

- *Undergraduate:* Botany; Ecology; Ornithology; Dendrology; Herpetology; Principles of Wildlife Management; Habitat and Regulation of Wildlife; Important Plants in Fisheries and Wildlife Habitats; Field Method Research and Conservation of Invertebrate Populations; Wetlands Conservation; Science, Protection and Management of Aquatic Environments; Environmental Policy, Law and Human Behavior
- *Graduate:* Hydrology and Watershed Management; Hydrology and Water Quality Field Methods; Assessment and Diagnosis of Impaired Waters; Environmental Chemistry; Biogeochemical Processes; Watershed Engineering, Ecological Engineering Design; Hydrologic Design; Sustainable Waste Management Engineering; Water Policy; Policy and Science of Global Environmental Change; Vadose Zone Hydrology; GIS and Spatial Analysis; Remote Sensing of Natural Resources and the Environment; Research Problems in Spatial Data Analysis

SELECTED AWARDS

- *Graduate*
 - Bergsrud Graduate Fellowship, UMN Bioproducts and Biosystems Engineering (May 2017 - Aug. 2017)
 - Doctoral Dissertation Fellowship, University of Minnesota (Sept. 2016 - May 2017)
 - MNDRIIVE Undergraduate Scholar Research Grant (\$5k), University of Minnesota (Jan. 2015)
 - Bill Wilcke Graduate Fellowship, UMN Bioproducts and Biosystems Engineering (Aug. 2014 - Aug. 2016)
- *Undergraduate*
 - O. Gordon Scholarship, UMN CFANS (Spring 2010)
 - Izaak Walton League of America Scholarship (2009-2010 academic year)
 - Augustus Searles Scholarship, UMN CFANS (2009-2010 academic year)
 - Jay Hokenstrom Scholarship, UMN CFANS (Summer 2009)

OUTREACH ACTIVITIES

- CFANS Orientation to Fisheries and Wildlife, Guest Speaker, Topic: Watershed Planning and Consulting (Oct. 2018)
- BBE Sneak Peak for Potential New Students, Tour Presenter, Topic: Bioreactors (Oct. 2017)
- BBE Orientation Session Leader, Topic: Agricultural Nutrients and Bioreactors (Oct. 2016)
- UMN Sustainability Action! Open House Exhibitor, Topic: Bioreactors (Aug. 2016)
- CSE Discover STEM K-12 Outreach Program: Camp Lesson Leader, Topic: Agricultural Nutrients (Aug. 2016)
- University of Minnesota BBE Graduate Student Selection Committee, Student Representative (Jan. 2016)
- University of Minnesota BBE Faculty Search Committee, Student Representative (March – June 2015)
- University of Minnesota Water Resources Science Seminar Presentation, Topic: Two-Stage Ditch (Feb. 2015)
- Self-sustaining Ditch in Mower County, MN: Roundtable Discussion and Field Day; Adams, MN (June 2011)

ACADEMIC PRESENTATIONS

- Drainage Research Forum (2017); Ames, IA: Novel Bioreactor Media Experiments to Enhance Microbial Denitrification
- International Drainage Symposium (2016); Minneapolis, MN: Novel Bioreactor Designs for Removing Nitrate in Agricultural Drainage Waters
- Nutrient Management and Edge of Field Monitoring Conference (2015); Memphis, TN: Prioritizing watersheds for BMP placement: southern Minnesota case study
- Society of Ecological Restoration Symposium (2014); St. Paul, MN: Ecological Implications of Agricultural Drainage Ditch Restoration through a Two-Stage Design (Mower County, Minnesota)
- Driftless Area Symposium (2012); LaCrosse, WI: Air-water temperature relationships in the trout streams of the Driftless Area of southeastern Minnesota
- Water Resources Conference (2011); St. Paul, MN: Air-water temperature relationships in the trout streams of Southeastern Minnesota's carbonate landscape

PUBLICATIONS*

Peer-Reviewed

- Han, L. A., Wilson, B., Behrens, S., & Magner, J. 2025. Impact of temperature and residence time on nitrate removal in multi-media denitrifying bioreactors. *Biosystems Engineering* (submitted).
- Han, L. A., Wilson, B., & Magner, J. 2025. Non-Ideal Continuously Stirred Bioreactor Model for Multi-Media Denitrifying Processes. *Biosystems Engineering* 253. <https://www.sciencedirect.com/science/article/pii/S1537511025000571>.
- Han, L. A., Wilson, B., Magner, J., Lahti, L., Kramer, G., Hansen, B., & Nieber, J. 2025. Biochemical processes within a two-stage agricultural drainage ditch in Mower County, MN: Methods for estimating nitrogen removal rates and efficiencies. *Agricultural Water Management* 318. <https://doi.org/10.1016/j.agwat.2025.108832>.
- Krider, L., Kramer, G., Wilson, B., Magner, J., Lazarus, W., Hansen, B., & Nieber, J. 2022. Alternative agricultural ditch designs, NO₃-N treatment, construction costs, and benefits—Mower County, Minnesota, USA. *Journal of Environmental Science and Engineering B* 11: 229–240.
- Kramer, G., Peterson, J., Han, L., Hansen, B., Magner, J., Wilson, B., & Nieber, J. 2019. Design and construction of an alternative drainage ditch system. *International Journal of Hydrology* 3: 259–268.
- DeZiel, B. A., Krider, L., Hansen, B., Magner, J., Wilson, B., Kramer, G., & Nieber, J. 2019. Habitat improvements and fish community response associated with an agricultural two-stage ditch in Mower County, Minnesota. *Journal of the American Water Resources Association* 55(1): 154–188. DOI: 10.1111/1752-1688.12713.
- Krider, L., Magner, J., Hansen, B., Wilson, B., Kramer, G., Peterson, J., & Nieber, J. 2017. Improvements in fluvial stability associated with two-stage ditch construction in Mower County, Minnesota. *Journal of the American Water Resources Association* 53(4): 886–902. DOI: 10.1111/1752-1699.12541.
- Krider, L., Wilson, B., & Magner, J. 2016. Design and construction of a reduced temperature testing apparatus for denitrification. 10th International Drainage Symposium. St. Joseph, MI: ASABE.
- Peterson, J., Wilson, B., Titov, M., Krider, L., & Strock, J. 2014. Hydrologic impacts of side inlet storage modifications in an artificially drained agricultural landscape. American Society of Agricultural and Biological Engineers. Paper Number: 1909229.
- Krider, L. A., Perry, J., Magner, J. A., Vondracek, B., & Ferrington, L. C., Jr. 2013. Air-water temperature relationships in the trout streams of southeastern Minnesota's carbonate-sandstone landscape. *Journal of the American Water Resources Association* 49(4): 896–907. DOI: 10.1111/jawr.12046.

*Note: Dr. Han's former surname is Krider