

Carolyn B. Voter, Ph.D.

carolynbvoter.com

RESEARCH INTERESTS

- Sustainable and resilient communities
- Coupled human-natural systems
- Water resources management
- Hydrologic feedbacks (surface-groundwater interactions, land-atmosphere interactions)
- Ecosystem services
- Urban ecohydrology, green infrastructure, stormwater management
- Hydrologic modeling
- High throughput/performance computing

EDUCATION

- 2019 **Ph.D.**, Civil and Environmental Engineering, University of Wisconsin-Madison
- 2012 **B.S.**, Civil Engineering, Bucknell University

PROFESSIONAL APPOINTMENTS

- 2022 - **Assistant Professor**
Departments of Civil and Environmental Engineering and Earth Sciences
University of Delaware
- 2019 - 2021 **Wisconsin Water Resources Science-Policy Fellow**
University of Wisconsin-Madison
Water Use Section, Wisconsin Department of Natural Resources, Madison, WI
- 2012 - 2019 **Graduate Research, Project, and Teaching Assistant**
University of Wisconsin-Madison
- Summer 2011 **Environmental Remediation Engineering Co-op**
Geosyntec Consultants, Columbia, MD
- Summer 2009 **Water Resources Engineering Intern**
URS Corporation, Gaithersburg, MD

PUBLICATIONS

Peer-Reviewed Papers

- **Voter, C.B.**, F.J. Guerrero-Bolano, A.W. Latzka, B.M. Maitland, and J. Hauxwell. Adaptable University-Agency Early-Career Fellowship Program Creates a Win-Win-Win for Wisconsin's Waters. *In Review*.
- **Voter, C.B.** and S.P. Loheide II. 2021. Climatic controls on the hydrologic effects of urban low impact development practices. *Environmental Research Letters*, 16(6): 064021. <https://iopscience.iop.org/article/10.1088/1748-9326/abfc06>
- **Voter, C.B.** and S.P. Loheide II. 2020. Where and When Soil Amendment is Most Effective as a Low Impact Development Practice in Residential Areas. *Journal of the American Water Resources Association*, 56(5):776-789. <https://doi.org/10.1111/1752-1688.12870>
- **Voter, C.B.** and S.P. Loheide II. 2018. Urban Residential Surface and Subsurface Hydrology: Synergistic Effects of Low-Impact Features at the Parcel-Scale. *Water Resources Research*, 54. <https://doi.org/10.1029/2018WR022534>

Peer-Reviewed Conference Papers

- Mayo, L. and **C.B. Voter**. 2019. Introducing Students to Engineering by Helping Them RePicture Their World. ASEE Annual Conference & Exposition, Tampa, FL. <https://peer.asee.org/32265>. (17p.)

Other Publications

- **Voter, C.B.**, C. Hein, J. Chenevert, I. Anderson, R. Smail, M. Gibson, K. Doyle, S. Bunde. May 2021. Central Sands Lakes Study Technical Report: Lake Ecosystem Characterization and Response. Wisconsin Department of Natural Resources. https://widnr.widener.net/view/pdf/8u7p0l27xm/DG_CSLSAppendixB_2021.pdf?t.download=true
- **Voter, C.B.** 2019. Hydroecologic Effects of Urban Development Decisions in Residential Areas. (Doctoral dissertation). University of Wisconsin-Madison, Madison, WI.
- **Voter, C.B.** and E. Verbeten. February 2017. "Groundwater: Powering Wisconsin's Economy." *Wisconsin Natural Resources*. Wisconsin Department of Natural Resources. <http://dnr.wi.gov/wnrmag/2017/02/Insert1.pdf>

GRANTS & FELLOWSHIPS

2020 - 2022	Mitigating flooding, extreme heat, and heavy rainfall in urban coastal communities by "greening" , Wisconsin Sea Grant Institute (\$238,582) <i>Voter Role:</i> Co-Lead Author, Associate Investigator
2019 - present	Wisconsin Water Resources Science-Policy Fellowship , Wisconsin Water Resources Institute, UW-Madison (\$55,000 stipend) <i>Voter Role:</i> Postdoctoral Fellow
2018	Water@UW Science Communication Workshop , Graduate School Office of Professional Development, UW-Madison (\$850) <i>Voter Role:</i> Lead Author
2016	Measuring stormwater runoff and soil infiltration in residential neighborhoods , Anna Grant Birge Memorial Fund, UW-Madison (\$1,600) <i>Voter Role:</i> Lead Author
2015 - 2016	Wisconsin Water Resources Science-Policy Fellowship , Wisconsin Water Resources Institute, UW-Madison (\$33,231 tuition, stipend, fringe benefits) <i>Voter Role:</i> Student Fellow
2014 - 2015	Weston Fellowship , UW-Madison (\$37,466 for stipend, tuition, and fringe benefits; \$1,500 flexible funds) <i>Voter Role:</i> Student Fellow
2008 - 2012	Presidential Fellowship , Bucknell University (\$25,000 per year; \$1,500/semester research stipend) <i>Voter Role:</i> Student Fellow
Travel grants	Becker Travel Grant , UW-Madison (awarded 6x, \$1,970 total) Graduate School Research Competition Conference Travel Funds , UW-Madison (awarded 3x, \$3,000 total)

AWARDS & RECOGNITION

2021	AGU 2020 Editor's Citation for Excellence in Refereeing , Water Resources Research [link]
2019	James R. Villemonte Excellence in Research Award , Dept. of Civil and Environmental Engineering, UW-Madison
2019	Outstanding Graduate Oral Presentation , American Water Resources Association – Wisconsin Section Annual Meeting
2018	Outstanding Student Presentation Award , American Geophysical Union Fall Meeting
2012	Chancellor's Opportunity Award , UW-Madison
2012	Peer Award of Distinction , Dept. of Civil Engineering, Bucknell University
2012	Michael D. LaGrega Award for Excellence in Environmental Engineering , Bucknell University [description]
2012	Eleanor D. Decker Prize for Women , Bucknell University [description]
2010 – 2012	Michael Baker Scholarship for Diversity in Engineering , Michael Baker Corporation
2011	The Moles Scholarship , The Moles Society
2011	Chi Epsilon , Civil Engineering Honor Society
2010	Tau Beta Pi , Engineering Honor Society

PRESENTATIONS

Invited Talks and Panels

2021	Tackling Wisconsin's Water Challenges through UW Water Science-Policy Fellowships and Agency Partnerships. At: <ul style="list-style-type: none"> - Wisconsin Water Week, plenary session with panel discussion. Online. Mar 2021. - University of Wisconsin-Madison 5th Annual Symposium for Research Administrators, panel discussion. Online. Sep 2020.
2020	Defining a "significant" reduction in "average seasonal lake levels" in the Wisconsin Central Sands. At: <ul style="list-style-type: none"> - Wisconsin Potato and Vegetable Growers Association. Online. Mar 2020. - Water@UW-Madison Spring Symposium. Online. May 2020. - Wisconsin Lakes and Rivers Partnership. Online. Oct 2020.
2019	Advancing understanding of single family parcel hydrology to improve the hydroecologic outcomes of low impact practices. American Geophysical Union Fall Meeting . San Francisco, CA. Dec 2019. <i>eLightning</i>
	High Throughput Computing in Your Backyard: Urban Hydrology Applications. At: <ul style="list-style-type: none"> - Open Science Grid User School. Madison, WI. Jul 2019. - HTCondor Week. Madison, WI. May 2019. - HTCondor Week. Madison, WI. May 2018.

Protecting our Urban Waters. Wisconsin Chapter of the Society for Conservation Biology, presentation and panel discussion. Madison, WI. Feb 2019.

- 2018 Making a Difference Through a Water Science-Policy Fellowship. At:
- University of Wisconsin Sea Grant Institute, panel discussion. Webinar. Nov 2018.
 - University of Wisconsin Sea Grant Institute, panel discussion. Webinar. May 2017
- Delta Future Faculty Panel. Center for Integration of Research, Teaching, and Learning Fall In-Person Meeting, panel discussion. Madison, WI. Oct 2018.
- Low-impact practices in residential areas: how interactions among practices and with climate alter urban hydrology. Marquette University Environmental and Water Resources Engineering Seminar. Milwaukee, WI. Oct 2018.
- Low-impact practices on residential parcels: How and where they cause the biggest (hydrologic) bang. Nelson Institute Brown Bag Series. Madison, WI. Apr 2018.
- 2017 Variability in deep drainage from urban residential parcels: what interventions have the greatest potential impact? Wisconsin Groundwater Association Speaker Series. Madison, WI. Sep 2017.

Selected Conference Presentations * indicates student mentee

- 2021 *G.A. Alexander, **C.B. Voter**, S.P. Loheide II, and D. Wright. Incorporating the Hydrologic Impacts of Low Impact Development in a Large-Scale Land Surface Model. American Water Resources Association-Wisconsin Section Annual Meeting. Online. Mar 2021.
>> *Outstanding Graduate Oral Presentation*
- M. Parsen, **C.B. Voter**, C. Hein, and A.H. Pruitt. Lake-Groundwater Interactions of Plainfield, Long, and Pleasant Lakes in the Central Sands of Wisconsin. American Water Resources Association-Wisconsin Section Annual Meeting. Online. Mar 2021.
- 2020 **Voter, C.B.**, C. Hein, J. Chenevert, I. Anderson, A.H. Pruitt, M.N. Fienen, M.J. Haserodt, A. Leaf, and S. Westenbroek. Impacts of groundwater withdrawals on lake hydrology and ecology in a water-rich region: what matters most? American Geophysical Union Fall Meeting. Online. Dec 2020. *Poster*
- Avery, W.A., S.P. Loheide II, W.R. Selbig, H. Barker, K. Rabeler, D.M. Ciruzzi, and **C.B. Voter**. The role of urban canopy architecture in precipitation redistribution. American Geophysical Union Fall Meeting. Online. Dec 2020. *eLightning*.
- 2019 **Voter, C.B.** and S.P. Loheide II. Restoring urban ecohydrologic fluxes on a lot-by-lot basis: Which doors to knock on first? American Geophysical Union Fall Meeting. San Francisco, CA. Dec 2019.
- Voter, C.B.** and S.P. Loheide II. Soil amendment as a green infrastructure practice in residential areas. American Water Resources Association-Wisconsin Section Annual Meeting. Delavan, WI. Mar 2019.
>> *Outstanding Graduate Oral Presentation*

- *Nohr, K., **C.B. Voter** and S.P. Loheide II. Comparing soil infiltration capacity among and within residential parcels in Milwaukee. American Water Resources Association-Wisconsin Section Annual Meeting. Delavan, WI. Mar 2019. *Poster*.
>> *Outstanding Undergraduate Presentation*
- 2018 **Voter, C.B.** and S.P. Loheide II. Quantifying weather-driven differences in the hydrologic outcomes of low-impact practices. American Geophysical Union Fall Meeting. Washington D.C. Dec 2018.
>> *Outstanding Student Presentation Award*
- Voter, C.B.** Where does the rain go? Three Minute Thesis. Madison, WI. Nov 2018.
- Voter, C.B.** and S.P. Loheide II. Climate- and development-driven heterogeneity in hydrologic fluxes from urban residential parcels. Long Term Ecological Research Network – All-Scientists Meeting. Monterey Bay, CA. Oct 2018. *Poster*.
- Voter, C.B.** and S.P. Loheide II. What's the weather like? How climate affects the hydrologic outcomes of low-impact practices on residential parcels. Consortium for the Advancement of Hydrologic Sciences, Inc. (CUAHSI) Biennial Colloquium. Shepherdstown, WV. Jul 2018. *Poster*.
- Voter, C.B.** and S.P. Loheide II. Measuring and modeling stormwater runoff from residential blocks in Milwaukee, WI. American Water Resources Association-Wisconsin Section Annual Meeting. Appleton, WI. Mar 2018. *Poster*.
- 2017 **Voter, C.B.** and S.P. Loheide II. Introducing a real-world design problem to an intro water resources engineering course: effects on cognitive skills, confidence, and perception of value. UW-Madison Teaching and Learning Symposium. Madison, WI. May 2017. *Poster*.
- *Stieve, J., **C.B. Voter** and S.P. Loheide II. Particle Size Analysis of Milwaukee Soils. UW-Madison Undergraduate Research Symposium. Madison, WI. Apr 2017. *Poster*.
- Voter, C.B.** Getting the most bang for your buck: Mapping the hydrologic sensitivity of Madison parcels. North Temperate Lakes - Long Term Ecological Research Station Early Career Scientists Meeting. Madison, WI. Apr 2017.
- Voter, C.B.** and S.P. Loheide II. Potential change in groundwater recharge around the Madison Lakes under alternate residential development scenarios. American Water Resources Association-Wisconsin Section Annual Meeting. Elkhart Lake, WI. Mar 2017.
- 2016 & earlier **Voter, C.B.** and S.P. Loheide II. Effect of weather patterns in cities across the United States on surface runoff, deep drainage, and evapotranspiration from a residential parcel. American Geophysical Union Fall Meeting. San Francisco, CA. Dec 2016.
- C.B. Voter.** The Wisconsin Groundwater Coordinating Council: 2016 Updates and the Fellowship Experience. Water@UW-Madison Fall Poster Session. Madison, WI. Oct 2016. *Poster*.
- *Calderon, M., **C.B. Voter** and S.P. Loheide II. Soil Particle Size Analysis in Milwaukee. UW-Madison Undergraduate Research Symposium. Madison, WI. Apr 2016. *Poster*.

TEACHING & MENTORING

2018 **Certificate in Research Teaching and Learning**, Delta Program, UW-Madison
Science education coursework, internship, and portfolio defense
Internship: Introducing a real-world design problem to an intro water resources engineering course: Effects on cognitive skills, confidence and perception of value [\[view\]](#)
Portfolio: carolynbvoter.com/teaching-portfolio.html
Committee: Dr. Trina McMahon (chair), Dr. Steve Loheide, Dr. Daniel Wright, Dr. Amber Smith, Dr. Rosemary Russ

Classroom Instruction [\[student feedback\]](#)

2017 – present **Software Carpentry Workshop Instructor**, UW-Madison [\[more\]](#)
Organized and led live-coding workshops for scientists and engineers on the Shell (x2), Git, & R (half-day sessions within 2-day workshops)

Fall 2012 **Teaching Assistant**, CEE 311 Hydroscience, UW-Madison [\[more\]](#)
Designed and led three 2-hr weekly discussion sections for intro water res. engineering course; prepared and graded homework, projects, and exams

Guest Lectures

2016, 2019 “Urban Hydrology.” CEE 311 Hydroscience, UW-Madison

2014 “Flow Routing.” CEE 411 Open Channel Hydraulics, UW-Madison

Training [\[more\]](#)

2017 Teaching Inclusively Workshop, CIRTL, 3-hr online workshop

2017 Bias Training, UW-Madison, 2-hr workshop

2017 Research Mentor Training, UW-Madison, semester-long course

2016 Diversity Training Workshop, UW-Madison, 3-hr workshop

2016 Software Carpentry Instructor Training Workshop, UW-Madison, 2-day training

2015 Teaching in the College Classroom, UW-Madison, semester-long course

2013 New Educator Orientation Leader, UW-Madison, 2-day training 1x/semester

Graduate Mentees [\[more\]](#)

2020 – present Aaron Alexander, PhD student, Civil and Environmental Engineering, UW-Madison

Undergraduate Mentees [\[more\]](#)

2018 – 2019 Katlyn Nohr, Geological Engineering, UW-Madison

2018 Aaron Canton, Civil and Environmental Engineering, UW-Madison

2017 – 2018 Jared Stieve, Civil and Environmental Engineering, UW-Madison

2016 Alex Bauch, Civil and Environmental Engineering, UW-Madison

2015 – 2016 Martin Calderon, Civil and Environmental Engineering, UW-Madison

SERVICE

- 2016 – present RePicture Engineering, Founding Contributor
Contributions: support summer program, Roll Model profile, review grant proposals and papers, beta test new features
- 2018 – 2019 UW-Madison Civil Engineering Graduate Student Council, Appointed Rep.
Contributions: communicated graduate student concerns to department chair in semesterly meeting
- 2017 - 2018 Water@UW-Madison Executive Committee, Graduate Student Rep.
Contributions: obtained grant and arranged science communication workshop, planned and staffed spring symposium. Rotated off to become Water@UW Project Assistant the next year (2018 – 2019).

Reviewer for: Water Resources Research, Journal of Hydrology, Journal of the American Water Resources Association, Journal of Hydrologic Engineering, Journal of Water Resources Engineering, Environmental Research Letters.

PUBLIC ENGAGEMENT

Training & Experiences

- 2018 Green Infrastructure and Stormwater Management: A workshop to explore decision support tools to support community resiliency workshop. Sea Grant Extension, Milwaukee, WI. 3-day workshop.
- 2017 Community-Engaged Research Institute, Sea Grant Extension, Lansing, MI. 5-day workshop.

Coverage

- 2021 Can green infrastructure influence the weather in Milwaukee? [\[link\]](#)
- 2020 UW-Madison College of Engineering. A green scene: Engineers take a comprehensive approach to mitigating urban heat islands. [\[link\]](#)
- 2019 Wisconsin Water Resources Institute. Voter Returns as Water Resources Science-Policy Fellow to Shed Light on Central Sands Lakes. [\[link\]](#)
- 2019 EOS Research Spotlight. Strategies to Improve Urban Hydrology. [\[link\]](#)
- 2017 UW-Madison News. A Data Tool for Homeowners to Make Rain Gardens More Effective. [\[link\]](#)
- 2015 Wisconsin Water Resources Institute. Voter Elects to Become Debut WRI Fellow. [\[link\]](#)
- 2012 Wisconsin Water Resources Institute. A Little from a Lot. [\[link\]](#)