Minnesota Water Resources Conference

October 18–19, 2022

Saint Paul RiverCentre
175 West Kellogg Boulevard
Saint Paul, Minnesota

ccaps.umn.edu/water

Sponsored by:

Water Resources Center
University of Minnesota

College of Continuing & Professional Studies
University of Minnesota

Cosponsored by:

Department of Civil Engineering, University of Minnesota
Minnesota Section, American Society of Civil Engineers
Minnesota Sea Grant College Program, University of Minnesota
Natural Resources Research Institute, University of Minnesota

Welcome

We are pleased to invite you to the 2022 Minnesota Water Resources Conference, October 18–19 at the RiverCentre in Saint Paul.

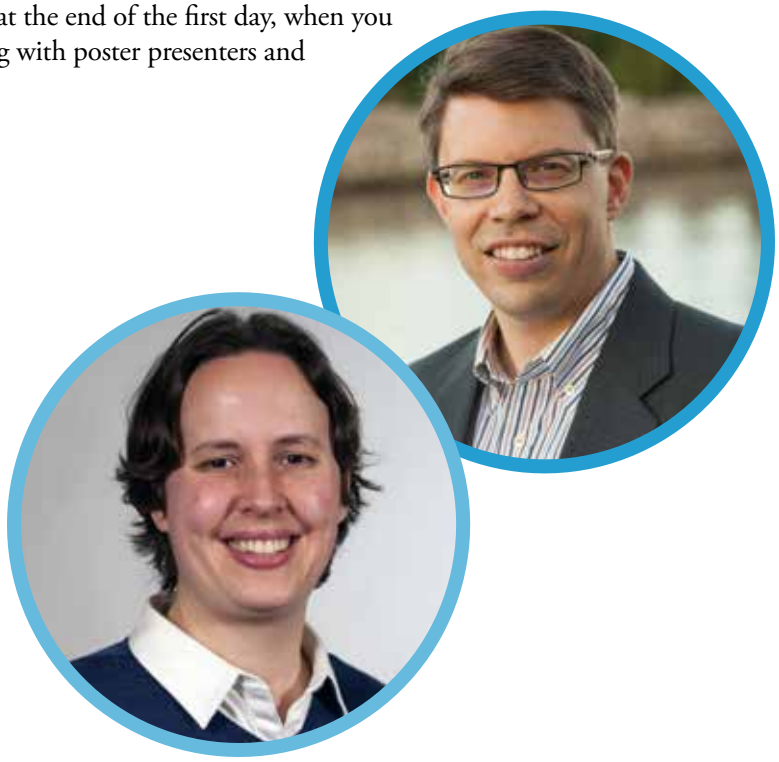
We are looking forward to returning to an in-person format for the first time since 2019. While we are eager to see everyone face-to-face, we also know that uncertainties persist. Covid will be a part of the world we live in for the foreseeable future and new variants driving more waves of infection are almost inevitable. Naturally, we are monitoring the public health situation and will follow the latest public health guidance. You should also know that the RiverCentre has taken numerous precautions to avoid the spread of Covid in their event space. We encourage you to attend the conference in a way that feels comfortable for you.

We know that many of you are looking forward to an in-person conference, yet we expect that many also will find it somewhat intimidating to connect with new people and engage in large-group discussions. This is especially true for those early in their careers and first-time attendees to a large event like ours. If you are a longtime attendee, please make a point to reach out to someone new and help them feel welcome. You'll get to know someone with common interests in water, and chances are you'll learn something from them.

We're really excited about this year's program. Designed with a live audience in mind, plenary sessions will include interactive discussions with multiple speakers on climate adaptation and the future of the Clean Water Fund. We will also have the opportunity to hear from Matt Simsik from the University of Minnesota about the timely and urgent topic of PFAS in our waters. New this year, award presentations will be featured in their own luncheon session. We warmly congratulate Rebecca Flood and Andrea Hendrickson, the co-recipients of the Dave Ford Water Resources Award, and are pleased to award the inaugural Deborah L. Swackhamer Early Career Award to Bridget Ulrich. As always, a richly varied set of topics will be presented in special sessions, technical sessions and posters. Don't miss the reception at the end of the first day, when you can network with your fellow attendees while interacting with poster presenters and exhibitors.

We look forward to seeing you in October!

Jeffrey Peterson,
Water Resources Center, University of Minnesota
and Emily Resseger,
Metropolitan Council
Conference Co-Chairs



2022 Water Resources Planning Committee

John Baker, US Department of Agriculture, and Department of Soil, Water, and Climate, University of Minnesota

Will Bartsch, Natural Resources Research Institute, University of Minnesota Duluth

Ann Banitt, US Army Corps of Engineers

Kari Benjamin, Burns & McDonnell

Jeff Berg, Minnesota Department of Agriculture

John Bilotta, Minnesota Sea Grant, University of Minnesota Extension

Erik Brenna, Minnesota Department of Transportation

Tina Carstens, Ramsey-Washington Metro Watershed District

Tracy Fallon, Water Resources Center, University of Minnesota

Leah Gifford, SRF Consulting Group

Lorin K. Hatch, AECOM

Kimberly Hill, St. Anthony Falls Laboratory, University of Minnesota

Ryan Johnson, City of Roseville

Cheryel Keyser, Water Resources Center, University of Minnesota

Joel Larson, Water Resources Center, University of Minnesota

Ron Leaf, Kimley-Horn and Associates

Drew McGovern, Hennepin County

Salam Murtada, Department of Natural Resources, Division of Waters

Randy Neprash, Minnesota Cities Stormwater Coalition & Stantec

**Jeffrey Peterson,* Water Resources Center, University of Minnesota

**Emily Resseger,* Metropolitan Council

Shawn Schottler, St. Croix Watershed Research Station

Wayne Sicora, ERM

Jeff Standish, MNDrive Environmental Initiative, University of Minnesota

Jim Stark, Minnesota State Legislature

Jared Trost, US Geological Survey

Rick Voigt, Voigt Consultants, LLC

David Wall, Minnesota Pollution Control Agency

Marcey Westrick, Minnesota Board of Soil and Water Resources

Greg Wilson, Barr Engineering Company

John Woodside, Minnesota Department of Health

*Committee Co-Chairs

General Information

Immerse yourself in innovative, practical, and applied water resource engineering solutions, management techniques, and current research about Minnesota's water resources. The Minnesota Water Resources Conference is an opportunity to address:

- lessons learned from the implementation of engineering projects
- best practices discovered in the design and application of water resource management techniques
- implications of water policy decisions research into current and emerging issues

Registration and Fees

Early registration (before September 12)

Two-day – $325
One-day – $300
Student – $75

Late registration (starting September 12)

Two-day – $375
One-day – $350
Student – $100

The registration fee for the Minnesota Water Resources Conference includes access into all plenary, luncheon, and concurrent sessions, special sessions, poster sessions, conference materials, lunch and refreshment breaks each day, and the Tuesday evening reception. Participants may register online for one or both days.

Cancellations

If you need to cancel your registration, a refund (minus $50) will be issued if you cancel on or before October 2, 2022. Cancellations after this date will not be eligible for a refund, but we may be able to substitute a colleague in your place. Please email ccapsreg@umn.edu to cancel your registration. The University reserves the right to cancel the conference, if necessary, in which case a full refund would be made.

Continuing Education Units (CEUs); Professional Development Hours (PDHs)

Conference attendees will receive 0.675 CEUs/6.75 PDHs for each day of the Minnesota Water Resources Conference. Participants who wish to receive full credit must attend all scheduled hours of the event.

Location and Parking

The Water Resources Conference will be held at the Saint Paul RiverCentre, 175 Kellogg Boulevard, Saint Paul. Parking is available in the RiverCentre parking ramp, which is located on Kellogg Boulevard across the street from RiverCentre. Convenient bus service to the RiverCentre is available: call Metro Transit at 612-373-3333 for specific route information.

Accommodations

Hotel rooms are available at the Holiday Inn Saint Paul Downtown, 175 West 7th Street, Saint Paul. Call the hotel directly at 651-225-1515 or toll free at 888-465-4329 and ask for the Water Resources Room Block rate. Make your reservation early in order to ensure a room at the hotel.

For Registration Questions

612-625-2900
ccapsreg@umn.edu

For Program Questions

Paul Engels
University of Minnesota
ccapsconf3@umn.edu

Twitter
We're on Twitter! Use hashtag **#MNWRC22** to continue this year's conference conversation.

Dave Ford Award

Originally known as the Kuehnast Award, the Dave Ford Water Resources Award was created in 2003, renamed for esteemed DNR hydrologist Dave Ford, who died prematurely from cancer in January 2003. Dave Ford was highly regarded by his water resources colleagues, who sought to honor him with an award to be presented to others in the field who also have made an indelible impact on Minnesota's environmental landscape. Dave had an excellent theoretical understanding of various computer simulation models, along with the practical knowledge to effectively use those models to address a variety of water resource management issues. But, more importantly, he was a teacher, a mentor, a collaborator, and a friend.

Recipients of the Earl Kuehnast Award

Year	Recipient
1986	Earl Kuehnast
1987	Ed Bowers
1991	Peter Fischer
1992	Howard Midje
1999	Ron Nargang

Recipients of the renamed Dave Ford Water Resources Award

Year	Recipient
2003	Heinz G. Stefan
2005	Marcel Jouseau
2006	Ron Harnack
2007	Patrick Brezonik
2008	Steve Heiskary
2009	James L. Anderson
2010	Nels Nelson
2011	Timothy Scherkenbach
2012	Barbara Liukkonen
2013	John Gulliver
2014	Roland Sigurdson
2015	Bruce Wilson (RESPEC)
2016	Cliff Aichinger
2017	Dan R. Engstrom, Kent Johnson
2018	Suzanne Jiwani
2019	Al Kean, Bruce Montgomery
2020	Deb Swackhamer
2021	Mike Trojan
2022	Rebecca Flood, Andrea Hendrickson

For more information on the award, recipients' bios, and how to nominate, go to https://ccaps.umn.edu/minnesota-water-resources-conference/dave-ford-award

Dave Ford Award Recipients

Rebecca Flood

Rebecca Flood has effectively partnered at all levels during her 40-year career protecting and improving Minnesota's water resources, while exhibiting compassion, credibility, critical-thinking, collaboration and generosity. Rebecca served 2008–2018 as Assistant Commissioner for Water Policy at the Minnesota Pollution Control Agency. She chaired the Clean Water Fund Interagency Coordination Team and served as state representative on the EPA's Gulf of Mexico Hypoxia Task Force and Association of Clean Water Administrators.

Rebecca is currently a post-retirement manager at Metropolitan Council Environmental Services (MCES), where she also served 1978–2008, much of that time as Environmental Compliance Manager. She was critical in the complicated process of decommissioning multiple small, noncompliant municipal wastewater treatment plants, and creating MCES's effective regional wastewater system. She was instrumental in negotiating effluent phosphorus permits for this system, resulting in cost-effectiveness and a phosphorus removal rate above 80%. She also worked collaboratively and respectfully to resolve dewatering permit issues between MCES and the DNR—balancing protection of treatment plant infrastructure with impact to the Seneca Fen. Rebecca has been a most generous mentor. Many water professionals, especially women, currently stepping up to leadership roles in water resources have relied on Rebecca for trusted guidance.

Andrea Hendrickson

Andrea Hendrickson has been a leader and innovator in transportation hydraulics for over 35 years. Andrea received her bachelor's and master's degrees from the University of Minnesota, while working as a teaching assistant and research assistant. She started with the Minnesota Department of Transportation in 1985 as a Graduate Engineer and was the State Hydraulics Engineer from 2004 to 2022. Andrea was responsible for the standards, specifications, and guidelines used for the design and construction of bridges, culverts, and storm drain systems. These standards and guidelines are used by many agencies, providing the backbone for transportation drainage statewide. Andrea has been the go-to person for water resources issues at MnDOT. She was consistently asked to field questions, review and resolve disputes, and provide technical guidance on complex drainage matters.

Her reach and influence extend well beyond MnDOT. She championed and has been a panel member for numerous State and National research projects in bridge scour, asset management, Midwest region Atlas 14 and climate resilience. Andrea is a committed mentor and advisor and is a strong booster of the Graduate Engineer and Civil Engineering Internship programs at MnDOT. Andrea has developed and mentored an accomplished support staff, some of which are experienced technical experts and department leaders themselves.

Deborah L. Swackhamer Early Career Award

A longtime professor and administrator at the University of Minnesota, Deborah (Deb) Swackhamer was among the leading voices in the nation at the intersection of science, policy, and water resources. She conducted influential scientific work on the behavior of organic pollutants and endocrine-disrupting chemicals. In the broader water resources community, she is remembered for her advocacy of scientific integrity and for incorporating science-based knowledge into policy making. This work elevated her to numerous leadership roles at the state, national, and international levels. During her career, Deb mentored students and young faculty and ardently supported them, challenging them to conduct rigorous science, guiding them to successful careers and connecting them with colleagues in her network.

Following Deb's untimely passing in 2021, the Minnesota Water Resources Conference committee approved a new award to be given in her name. In remembrance of her commitment to early career scientists and professionals, as well as her example of authentic leadership, the Deborah L. Swackhamer Early Career Award is meant to spotlight future leaders in the understanding, management, and care of our water resources.

For more information on the award, recipients' bios, and how to nominate, go to https://ccaps.umn.edu/minnesota-water-resources-conference/swackhamer-award

Dr. Bridget Ulrich

Dr. Bridget Ulrich is the inaugural recipient of the Deborah L. Swackhamer Early Career Award. Bridget is a Minnesota native, and as an undergraduate was nominated by Deb herself for the UMN Presidential Student Leadership and Service Award to recognize her efforts to promote campus sustainability. After graduate and postdoctoral training in Colorado and Switzerland, Bridget was drawn back to northern Minnesota to begin her career at the Natural Resources Research Institute (NRRI) at UMD. Bridget is a trailblazer much like Deb in finding new ways to protect Minnesota's water resources. She is currently developing an Environmental Analytical Chemistry facility, that specializes in analysis of many of the contaminants that Deb focused on, as well as other emerging contaminants that are highly relevant to Minnesota including poly- and perfluoroalkyl substances (PFAS). Bridget is also on the cutting edge of developing stormwater treatment technologies using filter materials derived from Minnesota wastes, including biochar and iron-mining byproducts. She is dedicated to service and science communication, having organized a special session on biochar at the 2021 WRC, and co-authored an article about PFAS for Lake Superior Angler magazine. She has shown willingness to create diverse partnerships, including current collaborations with CFANS, Lake County, and the Mississippi Watershed Management Organization. She also actively promotes diversity, equity, and inclusion (DEI) in workplaces and communities: she sits on NRRI's DEI committee, and is steadfast to engage and support women in spaces where they are underrepresented, including engineering and mountain biking.

Program Schedule

Please visit the Water Resources Conference website at https://ccaps.umn.edu/minnesota-water-resources-conference for the book of abstracts and full program schedule

Tuesday, October 18, 2022

8:00–9:30	**Welcome — Grand Ballroom** *Jeff Peterson*, Director, Water Resources Center, University of Minnesota
	Plenary Session Climate and Water - the Minnesota Climate Action Framework *Dana Vanderbosch*, Minnesota Pollution Control Agency *Mindy Granley*, City of Duluth, Heidi Roop, University of Minnesota
9:30–10:00	**Poster and Vendor Refreshment Break**

Concurrent Session I

	Track A — Ballroom A	Track B — Meeting Rooms 1-3	Track C — Meeting Rooms 4-6	Track D: Special Sessions — Meeting Rooms 7-9
10:00–11:30	**Engineering Solutions—Sand Filters** **Moderator: *Greg Wilson*** **Co-Moderator: *Kimberly Hill***	**Agriculture Water—Soil** **Moderator: *Jared Trost*** **Co-Moderator: *Dave Wall***	**Wetlands Workshop** **Moderator: *Jack Distel*** **Co-Moderator: *Keller Leet-Otley***	**Transforming Water Management through the Arts** **Moderator: *Marcey Westrick*** **Co-Moderator: *Tracy Fallon*** *Abby Moore*, Mississippi Water Management Organization; *Sarah Nassif*, Artist; *Christine Baeumler*, Artist; *Lindsay Schwantes*, Capitol Region Watershed District This session will focus on integrating art and artists into community engagement strategies to achieve clean water goals. A panel will highlight recent examples of how this collaboration is enriching and transforming their work. Following the panel, attendees will have an opportunity to explore together how art and artists may enhance their programs and projects. The session will end with an artist-led project and something for all attendees to take with them.
10:00–10:20	**1034: Pricey or Practical? Implementation and operation of pumps and automation in sand filters.** *Alex Schmidt*, Houston Engineering; *Kyle Axtell*, Rice Creek Watershed District; *Mike Behan*, Dakota County	**1004: Advancing Water Quality and Conservation through Climate Smart Bridge Payments to Farmers** *Brad Jordahl Redlin, Danielle Isaacson*, Minnesota Department of Agriculture—Water Quality Certification Program	**BWSR Updates** *Ben Meyer*, Minnesota Board of Water and Soil Resources	
10:20–10:40	**1035: Pollutant Removal and Maintenance of Underground Sand Filters** *Todd Shoemaker*, Stantec	**1006: Cover Crops and Living Mulches Effects on Irrigated Corn-Soybean Production Systems: An Integral Nutrient, Water, and Environmental Management Strategy** *Eduardo Garay Lagos, Fabián Fernández*, University of Minnesota	**1054: Dynamic Storage in Peatland Catchments** *David J. Adams, Salli F. Dymond*, University of Minnesota Duluth	
10:40–11:00	**1039: Experimental Field Trial of Media for a Modified Iron-Enhanced Sand Filter** *Josh Kirk, Andy McCabe, Keith Pilgrim, Janna Kieffer*, Barr Engineering Co.	**1010: Enhancing the Prioritize, Target, and Measure Application (PTMApp) User Experience** *Scott Kronholm*, Houston Engineering Inc.; *Matt Drewitz*, Minnesota Board of Water and Soil Resources	**1026: Wild Rice Populations Recover Quickly in Mesocosms in Response to Lower Sulfate Loads in Surface Water** *Nathan Johnson, John Pastor, Brad Dewey, Leah Higgins*, University of Minnesota Duluth; *Sophie LaFond-Hudson*, Oak Ridge National Lab	

Program Schedule

11:00–11:20	**1040: Can Biofilters Capture Phosphate and Grow Plants?** *Andy Erickson, Katie Kramarczuk, Jessica Kozarek,* St. Anthony Falls Laboratory, University of Minnesota	**1012: The Potential for Improving Water-Quality and Habitat in Minnesota by Repurposing Unprofitable Cropland with Perennial Vegetation** *Jason Ulrich, Shawn Schottler,* Science Museum of Minnesota, St. Croix Watershed Research Station	**Phragmites Reporting Tool and Management** *Julia Bohnen,* University of Minnesota **WPA Updates** *Keller Leet-Otley,* Kimley-Horn and Associates; *Jack Distel,* City of Bloomington	
11:20–11:30	Q&A	Q&A	Q&A	
11:30–12:15	**Lunch**			
12:15–1:00	Luncheon Session – Grand Ballroom			
	Dave Ford and Deborah L. Swackhamer Awards and Poster Highlights			
Concurrent Session II				
Tuesday	**Track A – Ballroom A**	**Track B – Meeting Rooms 1-3**	**Track C – Meeting Rooms 4-6**	**Track D: Special Sessions – Meeting Rooms 7-9**
1:15–2:45	**Stormwater Management—Policy Admin** **Moderator: *Tina Carstens*** **Co-Moderator: *Emily Resseger***	**Climate** **Moderator: *Salam Murtada*** **Co-Moderator: *Ryan Johnson***	**Lakes and Nutrients** **Moderator: *Lorin Hatch*** **Co-Moderator: *Greg Wilson***	**Special Session: Growing Prospects for Winter Annual Crops in the Upper Midwest** **Moderator: *Jeffrey Peterson*** **Co-Moderator: *Will Bartsch*** *Axel Garcia y Garcia, Grace Wilson, Natalie Hunt, Jeffrey Strock, Amit Pradhananga, William Lazarus, Colin Cureton,* University of Minnesota; *Brent Dalzell, Lucia Levers,* USDA-Agricultural Research Service; *Margaret Wagner, Jeffrey Berg,* Minnesota Department of Agriculture; *Anne Schwagerl,* Minnesota Farmers Union This session will discuss the latest on the prospects for placing winter annual crops on the Minnesota landscape. Speakers will share recent research on the agronomics and environmental impacts of winter crops, new data on the economic and social barriers to their adoption, and emerging developments in markets for winter oilseeds. A panel of industry, government, and scientific leaders will discuss the prospects for accelerated change in the coming years.
1:15–1:35	**1045: MS4 Program Management, Everything Is Better With Apps** *Nico Cantarero,* Stantec	**1019: Soil Health of New Construction Soils in Roseville and Lessons in Compost Topdressing** *David Bauer,* Alliant; *Ryan Johnson,* City of Roseville	**1062: Geochemical Augmentation with Alumina for Phosphorus Attenuation and Cyanobacteria Bloom Suppression in Lakes and Reservoirs: Summary of Project Results in Five Basins** *David Austin, Roger Scharf,* Jacobs	
1:35–1:55	**1066: Optimism, Ignorance or Foolishness: Are We Setting Practical Water Quality Goals?** *Mark Deutschman, Charles Fritz,* International Water Institute	**1020: Linn Grove Dam: A Tale of Adapting Design to Existing Infrastructure, Climate Change, and Community Expectations.** *Derek Lash,* Emmons & Olivier Resources, Inc. (EOR)	**1063: Sediment Core Collection Optimization for Internal Loading Management** *Anne Wilkinson, Katie Kemmit, Conor Dougherty, Dendy Lofton,* Stantec, Inc	
1:55–2:15	**1067: Metropolitan Council's Priority Waters List: A Tool for More Effective Water Resources Management** *Emily Resseger, Erik Herberg, Henry McCarthy,* Metropolitan Council	**1021: Calibrating the Cannon River: Gridded Precipitation and HEC-HMS Modeling in a Lake-laden Watershed** *Brady Nahkala, Roberta Cronquist,* Bolton & Menk, Inc.	**1064: Internal Phosphorus Loading in Lakes: What Is It and How Do We Manage It?** *Dendy Lofton,* Stantec	

Program Schedule

2:15–2:35	**1071: Thousands of BMPs? How to Best Manage and Prepare for Maintenance** *Laura Wehr,* AE2S; *Kristin Seaman,* City of Woodbury	**1022: Adapting Stormwater Infrastructure in the Face of Climate Change** *Noah Gallagher, Andy Erickson, John Gulliver,* St. Anthony Falls Laboratory, University of Minnesota	**1065: The Role of Aluminum Sulfate (Alum) Treatments in the Restoration of Lake Riley, Minnesota** *Joseph Bischoff,* Barr Engineering Co.; *Josh Maxwell, Terry Jeffrey,* Riley Purgatory Bluff Creek Watershed District; *William James,* University of Wisconsin Stout	
2:35–2:45	Q&A	Q&A	Q&A	
2:45–3:15	**Poster and Vendor Refreshment Break**			
Concurrent Session III				
Tuesday	**Track A — Ballroom A**	**Track B — Meeting Rooms 1-3**	**Track C — Meeting Rooms 4-6**	**Track D: Special Sessions — Meeting Rooms 7-9**
3:15–4:45	**Stormwater** **Moderator: *Keri Benjamin*** **Co-Moderator: *John Bilotta***	**Engineering Solutions—Flooding** **Moderator: *Ann Banitt*** **Co-Moderator: *Kimberly Hill***	**Invasives and Aquatics** **Moderator: *Tracy Fallon*** **Co-Moderator: *Joel Larson***	**(continued) Growing Prospects for Winter Annual Crops in the Upper Midwest** **Moderator: *Jeffrey Peterson*** **Co-Moderator: *Will Bartsch***
3:15–3:35	**1032: Stormwater Pond Management Pilot Study** *Jesse Carlson, Connor Johnson,* City of Savage; *Bill Alms,* WSB	**1041: Parallel Floodplains: A Regional Public-Private Partnership** *Mat Cox,* Kimley-Horn and Associates	**1031: A Field Study of Maximum Wave Height, Total Wave Energy, and Maximum Wave Power Produced by Four Recreational Boats on a Freshwater Lake** *Jeffrey Marr, Andrew Riesgraf, William Herb, Matthew Lueker, Jessica Kozarek,* St. Anthony Falls Laboratory University of Minnesota; *Kimberly Hill,* Department of Civil, Environmental, and Geo-Engineering, University of Minnesota	
3:35–3:55	**1047: Minneapolis Pond Survey, Maintenance Assessment, and Internal Loading Analysis** *Nico Cantarero,* Stantec; *Shahram Missaghi,* City of Minneapolis	**1033: Wood Lake Lift Station—From Feasibility to Construction** *Bill Alms, Kendra Fallon,* WSB; *Olivia Wycklendt,* City of Richfield	**1059: Effectiveness and Costs of Aquatic Invasive Species Spread Prevention in Minnesota.** *Nichole Angell, Nicholas Phelps, Valerie Brady, Amy Kinsley, Josh Dumke,* University of Minnesota; *Tim Campbell,* Wisconsin Sea Grant; *Reuben Keller,* Loyola University Chicago; *Adam Doll,* Minnesota Department of Natural Resources	

Program Schedule

3:55-4:15	**1049: Evaluation of Wet Detention Pond Performance and Application of the General Lake Model** *Caitlin Lulay, Anthony Parolari, Brooke Mayer, Walter McDonald,* Marquette University	**1044: Small Site Permitting for Local Flood Issues** *Zuleyka Marquez,* City of Edina	**1060: Spatial Patterns and Environmental Drivers of Horizontal, Diel, and Seasonal Distribution of the Invasive Zooplankton Bythotrephes in a Minnesota Reservoir** *Megan Corum, Donn Branstrator,* University of Minnesota Duluth	
4:15-4:35	**1058: Pond Treatment with Spent Lime to Control Sediment Phosphorus Release** *Greg Wilson,* Barr Engineering Co.	**1042: Everest Lane Stream Stabilization Project** *Kendra Fallon, Jake Newhall,* WSB; *Derek Asche,* City of Maple Grove	**1061: Boot, Root, & Boogie (Carp Booted, Plants Rooted, Staff Boogied** *Jeff Anderson, Shauna Capron, Elizabeth Froden,* Prior Lake-Spring Lake Watershed District	
4:35-4:45	Q&A	Q&A	Q&A	
4:45-5:45	**Reception, Vendor, and Poster Session**			

Program Schedule

Wednesday, October 19, 2022

8:00–8:10	**Welcome** *Emily Resseger,* Metropolitan Council
8:10–9:30	**Plenary Session — Grand Ballroom** Minnesota's Clean Water Fund – Creating the Legacy for Today and Tomorrow
9:30–10:00	**Poster and Vendor Refreshment Break**

Concurrent Session IV

Wednesday	Track A — Ballroom A	Track B — Meeting Rooms 1-3	Track C — Meeting Rooms 4-6	Track D: Special Sessions — Meeting Rooms 7-9
10:00–11:30	**Green** **Moderator: *Ron Leaf*** **Co-Moderator: *Erik Brenna***	**Agricultural Assessment and Evaluation** **Moderator: *Jeff Berg*** **Co-Moderator: *Marcey Westrick***	**Nutrients and Wastewater** **Moderator: *Joel Larson*** **Co-Moderator: *Salam Murtada***	**Special Session: The Minnesota Drought of 2021** **Moderator: *Jim Stark*** **Co-Moderator: *Rick Voigt*** *Pooja Kanwar, Luigi Romolo, Dan Miller, Ellen Considine, Amanda Yourd, Carmelita Nelson,* Minnesota Department of Natural Resources This session will address the 2021 drought, through the DNR's perspective, by exploring science, planning, and effects. Presenters will describe the drought and the DNR's planning, communication, and coordination efforts. Effects of the drought will be shared, including permit suspensions, well interferences, and conservation efforts. The session includes a case study in northwestern Minnesota, illustrating the effects of water shortage. Presenters will discuss lessons learned, challenges, and opportunities, ending with a group discussion.
10:00–10:20	**1048: The Potential Water Quality and Other Co-Benefits of Solar Energy** *Patrick Hamilton, Adam Heathcote,* Science Museum of Minnesota	**1011: Assessing the Implications of Chloride from Land Application of Manure** *Matthew Belanger, Erin Cortus, Melissa Wilson,* University of Minnesota	**1016: Efficacy of Membrane Bioreactor in Wastewater Treatment Utilizing Fathead Minnow (Pimephales Promelas) Exposure** *Charles Christen, Alissa VanDenBoom, Molly Lovsness, Heiko Schoenfuss,* St. Cloud State University	

Program Schedule

10:20–10:40	**1050: Adventures in Establishing Linear Reconstruction GI: 3 Years of Designing and Building Practices Before the Stormwater Ordinance** *Katie Kowalczyk, Allison Bell,* City of Minneapolis	**1002: Minnesota's State of Soil Health: Research and Outreach Update from the Minnesota Office for Soil Health** *Anna Cates, A. Marcelle Lewandowski,* University of Minnesota	**1025: Municipal Wastewater Plants Meet Low- Level Mercury Limits by Controlling Effluent Suspended Solids** *Nathan Johnson, Kelsey Hogan, Adrian Hanson,* University of Minnesota Duluth; *Scott Kyser,* Minnesota Pollution Control Agency; *Geordee Spilkia,* Water Resources Science Program, University of Minnesota	
10:40–11:00	**1051: Unearthing an Approach to Vegetation Establishment in Urban Green Infrastructure** *Allison Bell,* City of Minneapolis; *Britta Hansen,* EOR	**1014: Assessing Agricultural Producers' Motivations to Participate in the Minnesota Agricultural Water Quality Certification Program** *Amit Pradhananga, Derric Pennington,* University of Minnesota; *Daniela Miteva, Samuel Cheng,* Ohio State University	**1079: Measuring the Gross Solids in Stormwater and the Associated Nutrient Loading** *Aaron Pietsch, John Chapman, Jacques Finlay, Larry Baker, Grace Wilson,* University of Minnesota	
11:00–11:20	**1052: North and East St. Paul Target Store Stormwater Retrofits** *Paige Ahlborg,* Ramsey-Washington Metro Watershed District; *Katie Turpen-Nagel,* Barr Engineering Co.	**1069: Improving Minnesota's Strategies and Tools for Nutrient Reduction in Local and Downstream Waters** *David Wall,* Minnesota Pollution Control Agency	**1056: Using Satellite Derived Water Quality Data from an Automated High Performance Computing Environment for Spatial/Temporal Trend Analysis of 10,000+ Minnesota Lakes** *Leif Olmanson, David Porter,* University of Minnesota	
11:20–11:30	**Open Discussion**	**Open Discussion**	**Open Discussion**	
11:30–12:15	**Lunch**			
12:15–1:00	**Luncheon Session — Grand Ballroom** PFAS and the Implications for Minnesota's Water Resources *Matt Simcik,* University of Minnesota			
Concurrent Session V				
Wednesday	**Track A — Ballroom A**	**Track B — Meeting Rooms 1-3**	**Track C — Meeting Rooms 4-6**	**Track D: Special Sessions — Meeting Rooms 7-9**
1:15–2:45	**Pollutant Removals and Stormwater** **Moderator: *Ryan Johnson*** **Co-Moderator: *Leah Gifford***	**Groundwater and Drinking Water** **Moderator: *Jim Stark*** **Co-Moderator: *Jarod Trost***	**Miscellaneous** **Moderator: *Erik Brenna*** **Co-Moderator: *Kimberly Hill***	**Climate Change, Agricultural Drainage and Water Storage in Minnesota** **Moderator: *Lorin Hatch*** **Co-Moderator: *Jeff Standish***

Program Schedule

1:15–1:35	**1023: Designing a Lower Salt Future.** *Connie Fortin, Tim Olson,* Bolton & Menk	**1027: Understanding Motivations for and Barriers to Well Water Testing** *Amelia Kreiter, Mae Davenport, Crystal Ng, Scott Alexander, Amit Pradhananga,* University of Minnesota; *Jeff Broberg,* Minnesota Well Owners Organization	**1013: Identifying Incremental Changes to Reservoir Operations to Reduce Flooding Impacts on Agricultural Lands in a Heavily Regulated System** *Brett Hultgren,* U.S. Army Corps of Engineers	*Joe Magner, Gary Sands,* University of Minnesota; *Nadia Alsadi,* MCEA; *Rita Weaver,* BWSR; *Chuck Brandel,* ISG; *John Kolb,* Rieke Noonan Many older drainage systems in MN are undersized and in need of improvements, including ways to accommodate a shift towards a wetter climate and allow cropland to remain viable. However, watershed protection and water quality improvement efforts may call for storing more water on the land. Here we give a southern MN case example addressing this challenge, offering inputs from state agency, industry, legal (e.g., Statute 103E), and historical perspectives. A panel discussion will follow.
1:35–1:55	**1046: Materials for Maximizing Phosphorus Removal from Stormwater** *Nigel Pickering,* Geosyntec Consultants; *Md. Arafat Ali,* University of Buffalo	**1028: Finally, Financial Assistance for Private Well Testing and Treatment: The Experience of Two Pilot Grants** *Emily Berquist,* Minnesota Department of Health; *Caitlin Brady,* Olmsted Soil and Water Conservation District; *Jessica Peterson,* Horizon Public Health	**1057: Sediment Source Delineation for the Little Fork River Basin Using Sediment Fingerprinting and Sediment Budgeting Techniques** *Anna Baker, Faith Fitzpatrick, Shelby Stearner,* U.S. Geological Survey; *Mike Kennedy, Jesse Anderson, Kevin Stroom,* Minnesota Pollution Control Agency; *Sam Soderman,* Koochiching County SWCD; *Phil Norvitch,* North St. Louis Soil and Water Conservation District; *Andy Kasun, Karen Gran,* University of Minnesota Duluth	
1:55–2:15	**1055: Leveraging Minnesota's Stormwater Monitoring Data to Better Understand Drivers of Urban Runoff Pollution** *Ben Janke, Jacques Finlay, Bruce Wilson,* St. Anthony Falls Laboratory, University of Minnesota; *Mike Trojan,* Minnesota Pollution Control Agency	**1037: High Nitrate! Part 2: The City of Fairmont's Implemented Projects to Contribute to the Solution** *Becca Vermace, Brendan Dougherty, Michelle Stockness, Kurt Leuthold,* Barr Engineering Co.; *Troy Nemmers, Tyler Cowing,* City of Fairmont; *Kerry Holmberg, Joe Magner,* University of Minnesota	**1080: Sustainable Nutrient Removal by Immobilized Cell Bioreactor Performing Denitrifying Anaerobic Methane Oxidation Coupled with Ammonia Oxidation** *Susma Bhattarai Gautam, Chan Lan Chun, Christopher Filstrup,* Natural Resources Research Institute	
2:15–2:35	**1076: Simultaneous Removal of Phosphate and Nitrate from Urban Runoff Using Mixtures of Taconite Byproduct and Wood-Waste-Derived Biochar** *Tadele Haile, Bridget Ulrich,* Natural Resources Research Institute, University of Minnesota Duluth; *Karina Wellborg, Joe Magner,* University of Minnesota	**1053: Groundwater Governance in the Great Lakes Region** *Carrie Jennings, Eileen Kirby,* Freshwater; *Terin Mayer,* University of Minnesota	**1009: Precipitation and Landforms as the Main Drivers of Baseflow in the Upper Midwest** *Satish Gupta,* University of Minnesota; *Kari Wolf,* University of Wisconsin River Falls; *Andrew Kessler,* Houston Engineering	
2:35–2:45	**Open Discussion**	**Open Discussion**	**Open Discussion**	
2:45–3:15	**Poster and Vendor Refreshment Break**			

Program Schedule

Concurrent Session VI				
Wednesday	**Track A — Ballroom A**	**Track B — Meeting Rooms 1-3**	**Track C — Meeting Rooms 4-6**	**Track D: Special Sessions — Meeting Rooms 7-9**
3:15-4:45	**Bank Stabilization and Stream Restoration** **Moderator: *Rick Voigt*** **Co-Moderator: *Kimberly Hill***	**City Planning and Visionary Planning** **Moderator: *Keri Benjamin*** **Co-Moderator: *Ron Leaf***	**Agriculture and Water** **Moderator: *Dave Wall*** **Co-Moderator: *Marcey Westrick***	**(Continued) Climate Change, Agricultural Drainage and Water Storage in Minnesota** **Moderator: *Lorin Hatch*** **Co-Moderator: *Ann Banitt***
3:15-3:35	**1036: St. Croix River Riverbank Stabilization and Riverwalk Project** *Angly Ulschmid,* AMI Consulting Engineers, PA; *Shawn Sanders,* City of Stillwater Public Works	**1068: Cumberland, WI – The Little Town With A Big Vision** *Jay Michels, Derek Lash,* EOR, INC; *Tom Schroeder,* Beaver Dam Lake Management District	**1001: Using Climate Data to Improve Nitrogen fertilizer Decision**s *Brad Carlson,* University of Minnesota Extension; *Dan Kaiser, Stefan Liess,* University of Minnesota;	
3:35-3:55	**1038: Phosphorus Load Reduction Using Streambank Stabilization – A Ten Year Follow Up** *Amy Anderson,* WSB	**1074: Understanding Diverse Water Values in the Twin Cities, Minnesota** *Sarah Roth, Mae Davenport, Bonnie Keeler,* University of Minnesota; *John Clark, Jennifer Kostrzewski,* Metropolitan Council	**1015: Improved Cost Estimates for Agricultural Conservation Practices** *Mark Deutschman,* International Water Institute	
3:55-4:15	**1070: Norway Lake Dam Removal & Rock Riffle Installation Project, City of Pine River, Cass County, MN** *Brent Johnson, Jammi Ladwig, Dustin deFelice, Bryan Drown, Andrew Beadell,* Bolton & Menk, Inc.	**1078: Consensus Building for a Mega-Project – the Gold Line Bus Rapid Transit** *Jacques DuVal, David Filipiak,* SRF Consulting Group, Inc.	**1007: Quantification of Water Storage Benefits at Various Levels of Cover Crop Applications** *Salam Murtada, Daniel Reinartz, Steve Kloiber,* Minnesota Department of Natural Resources	
4:15-4:35	**1073: Use of Sand Budgeting and Transport Modeling to Infer Historical Geomorphic Impacts in the Little Fork River Basin, MN** *Andy Kasun, Karen Gran,* University Minnesota Duluth	**1029: Groundwater Protection and Conservation: Experiences and Results at the Local Government Level** *Kelly Perrine, Mark Kruse,* City of Lakeville; *Travis Thiel,* Vermillion River Watershed Joint Powers Organization	**1008: Ravine Erosion in the Minnesota River Watershed: Permanent Sediment Traps to Improve Highway Safety and Reduce Maintenance** *Stephanie Rathburn, Sarah Barnett,* Alliant Engineering; *Nathan Pederson,* Minnesota Department of Transportation	
4:35-4:45	**Open Discussion**	**Open Discussion**	**Open Discussion**	
4:45	**Adjourn**			

2022 Exhibitors

For a full exhibitor list and more information go to
https://ccaps.umn.edu/minnesota-water-resources-conference/wrc-exhibitors

Poster Display

Be sure to check out the poster presentations throughout the conference.
There are great opportunities between sessions and at the Tuesday evening reception.