

PROGRAM SUMMARY

Wisconsin's Year of Clean Water

44th Annual Meeting of the American Water Resources Association—Wisconsin Section Wisconsin Dells, Wisconsin

THURSDAY, March 12, 2020

9:00 – 11:00 a.m. Registration

Riverview Pre-function area

11:00 – 11:45 a.m. Welcome and Lunch

Riverview North

Tina L. Brown

Executive Director, Ho-Chunk Nation Department of Natural Resources

Opening Remarks

Randy Polema

Environmental Specialist, Ho-Chunk Nation Division of Environmental Health

Ho-Chunk Nation's Water Resource Management Initiatives

11:45 – 1:15 p.m. Plenary Session

Riverview North

Todd Ambs

Assistant Deputy Secretary, Wisconsin Department of Natural Resources

Moving Beyond the Year of Clean Drinking Water

Rep. Todd Novak

Wisconsin State Legislature

Update on the Speaker's Task Force on Water Quality

1:15 – 1:30 p.m. Break: E/F/G/H

1:30 – 2:45 p.m. **Concurrent Sessions 1A, 1B, and 1C**

Session 1A **Agriculture and Water Quality**
Room: A/C
Moderator: **Patrick Gorski**

1:30 **Influence of Winter Manure Application on Non-Growing Season Nutrient Losses in Surface Runoff**
Laxmi Prasad,* UW – Madison, Dept. of Biological Systems Engineering

1:45 **Legacy Phosphorus in Stream Sediments: Removal & Water Quality Response**
John Reimer, Dane County Land & Water Resources

2:00 **Treatment of Horizontal Silage Bunker Runoff Using Biochar Amended Vegetative Filter Strips**
Joseph Sanford, UW – Madison, Dept. of Biological Systems Engineering

2:15 **Improving Nitrogen Management Strategies Across Wisconsin**
Tracy Campbell,* UW – Madison

2:30 **DATCP's Role and Responsibility for Wisconsin's Surface Water Quality**
Ken Potrykus, WI Dept. of Agriculture, Trade and Consumer Protection

Session 1B **Groundwater Quality**
Room: B/D
Moderator: **Maureen Muldoon**

1:30 **Incidence and Fecal Sources of Private Well Contamination in the Driftless Area: The Southwest Wisconsin Groundwater and Geology Study**
Joel Stokdyk, US Geological Survey

1:45 **Multi-year Well Water Quality Study in Trempealeau County**
Melissa Kono, UW – Madison

2:00 **The Dynamics and Speciation of Arsenic in Drinking Water Wells in Eastern Wisconsin**
Shangping Xu, UW – Milwaukee, Dept. of Geosciences

2:15 **Hydrogeologic and Geochemical Evidence for a Correlation Between Bedrock Folds and Arsenic Detection in Groundwater, Dodge County, Wisconsin**
Eric Stewart, WI Geological and Natural History Survey, UW – Extension

2:30 **What Comes After the Groundwater Study? The Need for Practical Responses to Regional Groundwater Contamination**
Kenneth Bradbury, WI Geological and Natural History Survey, UW-Madison Division of Extension

* Student presentation

- Session 1C** **Climate Change and Flood Risk**
Room: I
Moderator: Mike Rupiper
- 1:30 **Updating Rainfall Statistics for Infrastructure Design in a Warming Climate**
Daniel Wright, UW – Madison, Dept. of Civil and Environmental Engineering
- 1:45 **Restoring Hydrology to Solve Problems and Build Flood Resilience**
Kyle Magyera, Wisconsin Wetlands Association
- 2:00 **Investigating Paths to Increased Flood Resilience in the Coon Creek and Kickapoo River Watersheds**
Eric Booth, UW – Madison, Dept. of Agronomy
- 2:15 **Strategies for Managing Increasing Urban Flood Risk**
Kenneth Potter, UW – Madison, Dept. of Civil and Environmental Engineering
- 2:30 **Scaling Investment in Distributed Green Infrastructure Solutions**
Cynthia Koehler, WaterNow Alliance
- 2:45 – 3:00 p.m. **Break: E/F/G/H**
- 3:00 – 4:15 p.m. **Concurrent Sessions 2A, 2B, and 2C**
- Session 2A** **Surface Water Quality**
Room: A/C
Moderator: Michael Tiboris
- 3:00 **Low-cost Turbidity Sensors as a Method for Watershed Monitoring**
Andrew Schmitz,* UW – Green Bay
- 3:15 **Modeling Phosphorus and Algae Blooms in Utah Lake Using the Algae Estimator Smartphone Application**
Tyler Dietz,* UW – Parkside, Geosciences Department
- 3:30 **Untapped Data: Utilizing Satellite Remote Sensing to Improve Statistically-Based Water Quality Predictions**
Bryan O'Reilly,* UW – Madison, Nelson Institute for Environmental Studies
- 3:45 **A Survey of Cyanotoxins and the Occurrence of Harmful Algal Blooms in the Upper Midwest**
Hayley Olds, US Geological Survey, Upper Midwest Water Science Center
- 4:00 **Stream and River Conditions in Wisconsin and the United States**
Michael Miller, WI Dept. Natural Resources

* Student presentation

- Session 2B** **Hydrogeology**
Room: B/D
Moderator: Andrew Aslesen
- 3:00 **High Capacity Well Permitting Study for a Proposed Sand Mine, Jackson County, WI Part 1: Field Aquifer and Stream Characterization Program and Conceptual Model Development**
Pat Jurcek, INTERA
- 3:15 **High-capacity Well Permitting Study for a Proposed Sand Mine, Jackson County, Wisconsin Part 2. Hydrologic Analysis and Nr820 Review**
Erik Anderson, INTERA
- 3:30 **Characterization of Fluid Flow and Energy Exchange in a Natural Rough-Walled Fracture**
Noah Vriese,* UW – Madison
- 3:45 **Wisconsin Karst: Northeast Versus Southwest. What's the Same and What's Different?**
Maureen Muldoon, WI Geological and Natural History Survey, UW-Extension
- 4:00 **Disentangling Flow Processes in Fractured Sedimentary Rock**
Michael Cardiff, UW – Madison, Dept. of Geoscience
- Session 2C** **Climate Change and Water Resources Management**
Room: I
Moderator: Steve Corsi
- 3:00 **Concurrent Changes in Winter Precipitation and Ground Freeze-Thaw State and Implications for Streamflow Regimes**
Kamila Turczewski,* Marquette University
- 3:15 **Geologic Influence on Stream Temperatures and Implications for Future Trout Habitat in the Marengo Headwaters**
Anna Fehling,* WI Geological and Natural History Survey
- 3:30 **Physics to Fish: Lake-Specific Climate Change Adaptation Strategies for Cisco Habitat**
Madeline Magee, WI Dept. Natural Resources
- 3:45 **How Will Flood Hazard Change in a Warming Midwest?**
Guo Yu,* UW – Madison, Dept. of Civil and Environmental Engineering
- 4:00 **Characterizing the Biogeochemical Factors Impacting Manoomin(Wild Rice) Propagation and Survival in Wisconsin Wetlands Using Culturally-Relevant Practices and Various Spatial Resolutions**
Sarah Dance,* UW – Madison, Dept. of Civil and Environmental Engineering

* Student presentation

4:15 – 4:30 p.m. Break: E/F/G/H
4:30 – 5:30 p.m. Concurrent Sessions 3A, 3B, and 3C

Session 3A **Empirical Data Challenging Hydrologic Assumptions**
Room: A/C
Moderator: Adam Freihoeffer

4:30 **Cumulative Deviation from Moving Mean Precipitation as a Proxy for
Groundwater Level Variation in Wisconsin**
Robert Smail, WI Dept. Natural Resources

4:45 **Insights from Instantaneous Measurements: 15 Years of Streamflow Data in the
Central Sands**
Jessica Haucke, UW – Extension & UW – Stevens Point

5:00 **Water Use by Crops and Forest and Improving Irrigation Planning and Early
Prediction for Agricultural Drought in Wisconsin**
Ammara Talib,* UW – Madison, Civil and Environmental Engineering

5:15 **Impact of Agricultural Practices on Evapotranspiration Rates in Wisconsin**
Robert Smail, WI Dept. Natural Resources

Session 3B **Emerging Contaminants and Surface Water Quality**
Room: B/D
Moderator: Ken Potrykus

4:30 **Preliminary Survey of PFAS in Surface Water and Fish Tissue from Select
Wisconsin Waterbodies**
Timothy Asplund, WI Dept. Natural Resources

4:45 **The Potential Biological Impacts of Pesticides in Great Lakes Tributaries**
Samantha Oliver, US Geological Survey, Upper Midwest Water Science Center

5:00 **From Rivers to Lakes - the Movement and Distribution of Microplastics from
Tributaries to the Great Lakes**
Peter Lenaker, US Geological Survey, Upper Midwest Water Science Center

5:15 **Prioritizing Chemicals and Chemical Mixtures of Ecological Concern in Great
Lakes Tributaries**
Steven Corsi, US Geological Survey, Upper Midwest Water Science Center

* Student presentation

Session 3C

Conglomerate

Room: I

Moderator: Nicolas Buer

4:30

Water Chemistry and Lake Dynamics of Laguna Bacalar, Quitana Roo, Mexico

Ryan Matzuk,* UW – Milwaukee, Dept. of Geosciences

4:45

Importance of Childhood Pb Exposure from Food Crops Grown in Contaminated Residential Soils Versus Exposure from Soil/Dust or from Drinking Water

Tim Grundl, UW – Milwaukee, Dept. of Geosciences

5:00

USGS Plans for Integrated Model Development – the Gathering of the Clans

Mike Fienen, US Geological Survey

5:15

Challenges and Insights from Heat Transport Modeling of a Humid Temperate Watershed

Randy Hunt, US Geological Survey, Upper Midwest Water Science Center

5:30 – 6:00 p.m.

Break/Networking

6:00 – 7:15 p.m.

Dinner and Lightning Talks

Room: Riverview North

Evaluating the Condition of Wisconsin's Surface Waters

Catherine Hein, WI Dept. Natural Resources

Protecting Water Quality with Prairie Filter Strips

Craig Ficenc, Sand County Foundation

Using Hydrograph Separation to Improve a Statistical Water Quality Model

Matthew Diebel, Dane County Land & Water Resources

Quantifying Manure Application Methods on Greenhouse Gas Fluxes and Runoff Water Quality in a Dairy Agroecosystem

Eric Young, USDA, Agricultural Research Service

Adaptation Strategies for Wisconsin Lakes Facing Climate Change

Madeline Magee, WI Dept. Natural Resources

The Groundwater Connection: Implementing the Central Sands Lakes Study

Jeffrey Helmuth, WI Dept. Natural Resources

Putting the Fun in Fundamentals: Interesting Problems at the Intersection of Fluid Mechanics, Coastal Engineering, and Environmental Processes

Nimish Pujara, UW – Madison, Dept. of Civil and Environmental Engineering

Putting Science to Work for Clean Drinking Water

Andrew Aslesen, Wisconsin Rural Water Association

* Student presentation

7:15 – 10:00 p.m. Poster Session and Social

Room: Riverview South

1. **A Sedimentological Characterization of Huron Mountain Streams for Application to Future Ecological Studies**
Benjamin Sieren,* UW – Parkside, Geosciences Department
2. **Source Water Contribution in Albion Basin Wetlands Based on Spring and Surface Flow Measurements**
Kristen Carlson,* UW – Parkside, Geosciences Department
3. **A Seasonal Record of Monthly Mean Discharge in the Upper Midwest**
Paige Blaha,* UW – Whitewater
4. **Impact of Changing Frozen Ground Regimes on Groundwater Recharge in the Midwest**
Katrina Rabeler,* UW – Madison, Geological Engineering
5. **Frequency Dependence in Flow Properties of a Fractured Bedrock Aquifer**
Jeremy Patterson,* UW – Madison, Dept. of Geoscience
6. **Sharing Interactive Water Use Sector Data**
Joseph Rosnow, WI Dept. Natural Resources
7. **Hydrologic Investigation of the Chiwaukee Prairie Restoration Site (Kenosha County, Wisconsin)**
Nicholas Potter,* Michigan Technological University
8. **Transport of Microplastic Fibres in Waves: The Effects of Fibre Length and Wave Properties**
Gabrielle Every,* UW – Madison, Dept. of Civil and Environmental Engineering
9. **Geophysical Models Suggest Precambrian Bedrock Structures Are an Important Control on Precambrian Surface Topography**
Joseph Rasmussen,* UW – Madison, Dept. of Geoscience
10. **Solitary-wave-induced Boundary Layer Flows Over Permeable Beds**
Claudio Meza-valle,* UW–Madison, Civil and Environmental Engineering
11. **Are Knowledge Brokers an Undiscovered and Already Endangered Species in the Ecosystem of Environmental Organizations?**
Francisco Guerrero-Bolaño, WI Dept. Natural Resources
12. **Using Infrared Thermography to Characterize Temperature Over Space and Time in Wisconsin Springs**
J. Garrett Rachal,* Beloit College

* Student presentation

13. **Assessment of the Source and Mobility of Phosphorus in the Hydrologic System in Western Wisconsin**
Evan Lundeen,* UW – Eau Claire
14. **An Investigation of Phosphorus Loading Through Lacustrine Groundwater Discharge in Mud Lake, Barron County, WI**
Jacob Erickson,* UW – Eau Claire
15. **New Bedrock Mapping of Dodge County Improves the Geologic Framework for Understanding and Managing Southeast Wisconsin’s Groundwater Resources**
Esther Stewart, WI Geological and Natural History Survey, UW – Extension
16. **Lake-Groundwater Interactions of Plainfield, Long, and Pleasant Lakes in the Central Sands of Wisconsin**
Michael Parsen, WI Geological and Natural History Survey, UW – Extension
17. **Exploring Evidence of Increased Groundwater Nitrogen and Calcium in Lakes**
Paul McGinley, UW – Extension & UW - Stevens Point
18. **Legacy Phosphorus in the Green Lake Watershed**
Rachel Johnson,* UW – Madison, Dept. of Biological Systems Engineering
19. **Effectiveness of Agricultural BMPs Under Future Climate Using Swat Model**
Xi Chen,* UW – Madison, Dept. of Biological Systems Engineering
20. **Impact of Land Use Change on Water Quality Trends in the United States**
Charitha Gunawardana,* Marquette University
21. **Relationships Between Land Use and Stream Temperature in the Yahara River Watershed**
Yu Li,* UW – Madison, Dept. of Biological Systems Engineering
22. **Measuring Stream Baseflow Conditions in West-Central Wisconsin**
Katherine Langfield,* UW – Eau Claire
23. **Characterization and History of the Dead Tree Wetland at University of Wisconsin Parkside**
Amy Johnston,* UW – Parkside, Geosciences Department
24. **Precipitation Throughfall Beneath Urban Tree Canopies: An Investigation of Precipitation Re-Distribution**
William Avery,* UW – Madison, Civil and Environmental Engineering
25. **High-Frequency Monitoring of Water-Quality in Groundwater: What was Learned in the Glacial Aquifer of Central Wisconsin**
Krista Hood, US Geological Survey, Upper Midwest Water Science Center

* Student presentation

26. **Sorption of Monensin to Soil in Agricultural Runoff**
Abby Demeyer,* UW – Stevens Point, AWRA Stevens Point Chapter
27. **The Future of the DNR Groundwater Retrieval Network (GRN) Database**
Jennifer Filbert, WI Dept. Natural Resources
28. **Reliability of Green Stormwater Infrastructure: Modeling of Coupled Soil Moisture and Salt Dynamics in Urban Soils**
Lam Duyen Thuy,* Marquette University
29. **Development and Assessment of Season-Ahead Cyanobacteria Abundance Forecasts in Lake Mendota, Wi.**
Maxwell Beal,* UW – Madison
30. **Impact of Dissolved Organic Sulfur on Metal Distribution in Riverine Sediments**
Marissa Kneer,* UW – Madison
31. **Using Calcium Isotopes to Characterize the Surface Water Dynamics of Two Madison Lakes**
Gage Hunter,* Edgewood College
32. **Leachable Phosphorus in Street Leaf Litter and Its Impact on Phosphorus in Urban Stormwater Runoff**
Yi Wang,* UW – Madison
33. **Blueprint for Salt Sustainability on the UW - Madison Campus**
Lydia Salus,* UW – Madison, Nelson Institute for Environmental Studies
34. **Lake Russo: Pond or Lake?**
Jessica Baker,* UW – Parkside, Geosciences Department
35. **Seasonal Soil Nutrient Dynamics in Urban Green Spaces**
Isabelle Horvath,* Marquette University
36. **Isotopic Examination of Photochemical Demethylation of Mercury in Natural Systems**
Grace Armstrong,* UW – Madison
37. **Clear Water Farms: Farmer-Led Market Drivers for Agricultural Water Stewardship**
Michael Tiboris, River Alliance of Wisconsin
38. **Application of MeHg Stable Isotopes in the Lower Green Bay and Fox River Area of Concern to Understand Bioaccumulation in a Contaminated Freshwater Estuary**
Tylor Rosera,* UW Madison, Environmental Chemistry and Technology

* Student presentation

7:00 – 8:30 a.m. Board Breakfast Meeting
Room: Executive Board Room

8:30 – 10:00 a. m Concurrent Sessions 4A, 4B, and 4C

Session 4A High Great Lakes Water Levels
Room: A/C
Moderator: Mitch Olds

8:30 **Nature-based Shorelines for Wisconsin's Great Lakes Coast**
Briana Shea,* Wisconsin Sea Grant

8:45 **Adapting to a Changing Coast**
Adam Bechle, Wisconsin Sea Grant

9:00 **Meteo-rips (Meteotsunami Generated Rip Currents) in Lake Michigan**
Yuli Liu,* UW – Madison, Dept. of Civil and Environmental Engineering

9:15 **Restoring Ecological Health and Aquatic Biodiversity (Rehab) for Eroding Kenosha Dunes, WI**
Chin Wu, UW – Madison, Dept. of Civil and Environmental Engineering

9:30 **Coastal Bluff Erosion and Groundwater Responses to Elevated Lake Levels**
Collin Roland,* UW – Madison, Dept. of Geoscience

9:45 **Effects of High Water Levels on Wave Climate and Nearshore Processes in Lower Green Bay, WI**
Joshua Anderson, UW – Madison, Dept. of Civil and Environmental Engineering

Session 4B Urban hydrology
Room: B/D
Moderator: Barbara Eikenberry

8:30 **Monitoring the Performance of Two Bioswales that Collect Runoff from an Urban Farm**
Elizabeth Regier,* Marquette University

8:45 **When Traditional Site Restoration Isn't the Best Option: Recovering Ecological Resiliency Through Adaptive Water Resources Engineering**
Kirsten James, Hey and Associates, Inc.

9:00 **Impact of Increased Infiltration in Residential Sewersheds on Rainfall Derived Inflow and Infiltration**
Spencer Sebo,* Marquette University

* Student presentation

- 9:15 **Characterization of Chloride Concentration in Stormwater Runoff from Commercial Land Use**
Nicolas Buer, US Geological Survey, Upper Midwest Water Science Center
- 9:30 **Potential for a New Interceptometer: Monitoring Tree Sway with Accelerometers as an Indicator of Interception Before, During, and After it Rains**
Dominick Ciruzzi,* UW – Madison, Dept. of Civil and Environmental Engineering
- 9:45 **How's the Water? Fifteen Years of Fish Community Sampling in the Milwaukee Area**
Amanda Bell, US Geological Survey, Upper Midwest Water Science Center
- Session 4C** **Using Isotopes for Tracking Water Quality from the Source to Tap**
Room: I
Moderator: Sean Scott
- 8:30 **Using Stable Isotopes of H, O, S, B, Sr, Pb, Cu and Radiometric Dating to Elucidate Groundwater Flow Paths and Histories in the Cambrian-Ordovician Aquifer of Northeastern Wisconsin**
John Luczaj, UW – Green Bay, Dept. of Natural and Applied Sciences
- 8:45 **Using Isotopes to Investigate Sources of Solutes in the Cambrian-Ordovician Aquifer System of Eastern Wisconsin**
Amy Plechacek,* UW-Madison, Environmental Chemistry and Technology Program, Dept. of Civil and Environmental Engineering
- 9:00 **Examining Radionuclide Mobility in the Midwestern Cambrian-Ordovician Aquifer System**
Madeleine Mathews,* UW – Madison
- 9:15 **Isotopic Assessment of Mercury Transport in the Dissolved and Particulate-Bound Phases of Surface Water**
Sarah Janssen, US Geological Survey
- 9:30 **Using Stable Lead Isotope Composition to Track Lead Exposure in Drinking Water – Are Lead Lateral Lines the Source?**
Patrick Gorski, WI State Lab of Hygiene
- 9:45 **Mercury Contamination at Gruber's Grover Bay: Application of Mercury Isotopes as Source Tracer**
Michael Tate, US Geological Survey, Upper Midwest Water Science Center
- 10:00 – 10:15 a.m. Break: E/F/G/H**

* Student presentation

10:15 – 11:30 a.m. Concurrent Sessions 5A, 5B, and 5C

Session 5A The Central Sands Lakes Study

Room: A/C

Moderator: Jeff Helmuth

10:15 **Defining a “Significant Reduction” in Lake Levels in the Central Sands in Terms of Water Quality, Aquatic Life, and Recreation and Navigation**
Carolyn Voter, UW – Madison, Aquatic Sciences Center

10:30 **Heterogeneity in Context: A Glacial History Perspective on Wisconsin's Central Sands**
J Elmo Rawling III, WI Geological and Natural History Survey

10:45 **Estimating Groundwater Recharge, Irrigation Demand, and Crop Water Use for the Central Sands**
Stephen Westenbroek, US Geological Survey, Upper Midwest Water Science Center

11:00 **Development of a Regional Groundwater Flow Model of the Central Sands**
Meg Haserodt, US Geological Survey, Upper Midwest Water Science Center

11:15 **Do We Really Know Anything? Monte Carlo Simulations to Evaluate Potential Outcomes of a Lake Drawdown Test**
Andrew Leaf, US Geological Survey, Upper Midwest Water Science Center

Session 5B Surface Water Quality and Policy

Room: B/D

Moderator: Madeline Magee

10:15 **Instream Water Quality Response to Agricultural Best Management Practice Implementation in the Silver Creek Watershed**
Ben Young, NEW Water, Green Bay Metropolitan Sewerage District

10:30 **Municipal-Agriculture Partnerships for Watershed Management**
Bartlett Durand, Sand County Foundation

10:45 **Long-term Monitoring Sheds Light on Urban Stressors in Milwaukee Area Stream Communities**
Barbara Scudder Eikenberry, US Geological Survey, Upper Midwest Water Science Center

11:00 **Improving Predictions of TSS in Urban Models**
Judy Horwach, US Geological Survey, Upper Midwest Water Science Center

11:15 **Water Quality Indicators of Human Impacts to the Wetlands of Door Co., WI**
David Hart, WI Geological and Natural History Survey

- Session 5C Neonicotinoid Toxicity and Monitoring**
Room: I
Moderator: Mike Miller
- 10:15 **Widespread Detections of Neonicotinoid Contaminants in Central Wisconsin Groundwater**
Russell Groves, UW – Madison, Dept. of Entomology
- 10:30 **Neonicotinoid Pesticides in Wisconsin Groundwater and Surface Water**
Stanley Senger, WI Dept. of Agriculture, Trade and Consumer Protection
- 10:45 **Use of Polar Organic Chemical Integrative Samplers (Pocis) to Monitor Neonicotinoid Insecticides in Streams and Ditches on the Central Wisconsin Sand Plain**
William Devita, UW – Stevens Point, Water and Environmental Analysis Lab
- 11:00 **Chronic Exposure to Thiamethoxam Causes Neurotoxicity in Larval Fish**
Tisha King-Heiden, UW – La Crosse
- 11:15 **Acute and Chronic Toxicity of the Neonicotinoid Insecticide Thiamethoxam to Select Aquatic Invertebrates**
Elisabeth Harrahy, UW – Whitewater
- 11:45 – 12:00 p.m. **Student Awards and 2020 Meeting Announcements**
Room: E/F/G/H
Moderator: Mike Rupiper
- 12:00 – 2:00 p.m. **Student Career Session Lunch**
Room: Laguna Vista
Facilitator: Brent Brown