

2025 Great Plains Water Conference

Securing Water Resources
for Tomorrow

University of Nebraska-Omaha

Milo Bail Student Center

September 18 and 19



**Nebraska
Water Center**

Daugherty Water for Food Global Institute



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Announcements

Wi-Fi Username: water

Password: water2025

Navigating the Conference Center

Conference meals and sessions will be held on the second and third floors of the Milo Bail Student Center on UNO's campus.

Second Floor Rooms

Ballroom

- Main sessions and some breakout sessions
- Located to the left of the elevator and stairs

Nebraska Room

- Meals, breaks, poster competition, and evening reception
- Located to the right of the elevator and stairs

Chancellor's Room

- Side workshops on Wednesday and Friday
- Turn right when exiting the ballroom and go down the hallway to your right. The Chancellor's Room is located at the end of the hall on your left.

Third Floor Rooms

Dodge A

- Breakout sessions
- Located across from the staircase to the third floor, with access from the central lounge area.

Wednesday, September 17

Quick Agenda

2:00 - 2:30 p.m.

Check in for Know Your Well workshop..... Chancellor's Room

2:30 - 4:30 p.m.

Know Your Well workshop* Chancellor's Room

Thursday, September 18

Quick Agenda

7:30-8:30 a.m.

Continental breakfast..... Nebraska Room

7:30-8:30 a.m.

Registration and poster competition set up Nebraska Room

8:30-10 a.m.

Welcome and Keynote

Intro to Great Plains Water Institutes..... Ballroom

10-10:30 a.m.

Break

Student poster sessionNebraska Room

10:30 a.m. -12 p.m.

Morning Breakout Session

Water Smart Communities*Ballroom

Lessons from the Bazile Groundwater Management Area* Dodge A

12-1 p.m.

Lunch..... Nebraska Room

1-2 p.m.

Main Session I

Peer Power on Tap hosted by the Kansas Water Institute*Ballroom

2-3:30 p.m.

Afternoon Breakout Session

Water Quality 1: Nitrate* Ballroom

Water Management*Dodge A

3:30-4 p.m.

Break

Student poster sessionNebraska Room

4-5 p.m. Main Session II
Adapting to Weather Extremes hosted by South Dakota Water Resources Institute..... Ballroom

5-6 p.m. Evening Reception
Student poster competition winners announcedNebraska Room

Friday, September 19

Quick Agenda

7:30-8:30 a.m.
Continental BreakfastNebraska Room

8:30 a.m.-12:00 pm Side workshop
Advanced Data Analytics for Water Resources Managers using R hosted by South Dakota Water Resources Institute*Chancellor’s Room

8:30-10 a.m. Welcome and Keynote
Case Studies in Regional Basin Management* Ballroom

10-10:30 a.m. BreakNebraska Room

10:30 a.m. -12 p.m. Morning Breakout Session
Water Quality 2: Wellhead protection and other contaminants*Ballroom
Education and Outreach.....Dodge A

12-1 p.m. LunchNebraska Room

1-3:00 p.m. Afternoon Breakout Session
PFAS* Ballroom
Surface Water.....Dodge A

3-4 p.m. Closing Session
Securing Water Professionals for Tomorrow: A student-led panel.....Ballroom

4:00 p.m. Adjourn

Continuing Education Credits

All sessions marked with (*) are approved for Nebraska Water Well Standards Continuing Education Credit. There will be a sign-in sheet located in each eligible session at the back of the room for each attendee wanting to earn credit.

Agenda with Abstracts

Wednesday, September 17

2:30 - 4:30 p.m.

Pre-conference workshop

Bridging Education and Environmental Stewardship: Utilizing Citizen Science to Teach Water Quality Issues* (Chancellor's Room)



The Know Your Well (KYW) program is a citizen science program that began in Nebraska in 2017. In this workshop, participants will learn more about the KYW program and experience the first lesson in the KYW unit as students. Participants will then hear from a teacher and students who utilized the curriculum in their classroom and discuss the lessons learned from their first time in the field. Finally, participants will have time to explore the freely available materials and have small group discussions on how KYW can be adapted for schools near them.

Participants should bring laptops (preferred) or mobile devices.

Sara Brock-Contreras, Know Your Well Graduate Student; Daniel Snow, Water Sciences Laboratory Director; Rachael Herpel, Nebraska Water Center Assistant Director; Lee Ann Stover, Westview High School teacher; Dario Valdivieso, Long Hoang, Ben Mykris, and Jazmin Gardner, Westview High School students.

QR Codes

The QR codes on each page direct you to watercenter.unl.edu where attendees can read the speaker bios and full abstracts for each session.

Agenda with Abstracts

Thursday, September 18

8:30-10 a.m.

Welcome and Keynote (Ballroom)

Opening keynote: Intro to Great Plains Water Institutes



This session will give an overview of activities and research focuses for the Great Plains Water Centers including Nebraska, Kansas, Oklahoma, Missouri, Iowa, and South Dakota.

Chittaranjan Ray, Nebraska; Susan Metzger, Kansas; Kevin Wagner, Oklahoma; Laura Frescoln, Iowa; Ryan Lefers, South Dakota; Baolin Deng and Patrick Market, Missouri. Moderated by Karina Schoengold, Nebraska Water Center Associate Director.

10-10:30 a.m.

Break and Student Poster Competition (Nebraska Room)

Snacks will be provided

10:30 a.m. -12 p.m.

Morning Breakout Session

Water Smart Communities* (Ballroom)



Field of Dreams Watershed - Connecting Communities to Water:
Rejuvenating Ecosystems & Enhancing Livelihoods

Judith Joyce, Eocene Environmental Group

Innovations in Prioritizing Conservation and Tracking Progress Towards
Goals

Rachel Olm and Sara Mechtenberg, Houston Engineering

The economic and hydrologic impacts of groundwater quota regulation
design

Taro Mieno, University of Nebraska - Lincoln Agricultural Economics

Community Engagement for Wetland Restoration in the Blue River
Watershed

Robin Rotman, University of Missouri School of Natural Resources

Agenda with Abstracts

Thursday, September 18

Lessons from the Bazile Groundwater Management Area* (Dodge A)



Helping youth and adults understand nitrate movement and soil health

Amy Timmerman, UNL Extension, and Connie McCarthy, Lower Niobrara NRD Programs Assistant

Characteristics of the BGMA that make it susceptible to groundwater contamination

Joslynn VanDerslice, Water Resources Manager, Upper Elkhorn NRD

Quantifying the successes of Best Management Practices (BMPs) on mitigating nitrate leaching into groundwater

Connor Baldwin, Groundwater Management Area Specialist, Lower Elkhorn NRD

Using demonstration and research plots to advance nitrate mitigation

Amy Timmerman, UNL Extension

12-1 p.m. Lunch (Nebraska Room)

1-2 p.m.

Main Session I

Peer Power on Tap: How Testing Ag Performance Solutions redefines agricultural innovation through stakeholder collaboration* (Ballroom)



This discussion panel hosted by the Kansas Water Institute will highlight the evolution, structure, outcomes, and future directions of the TAPS program, emphasizing how different states have adapted the model to meet their state's needs while still underscoring the common goal of addressing water resource concerns through peer-to-peer learning and stakeholder engagement.

Roric Paulman, TAPS participant and Nebraska farmer; Chris Proctor, UNL extension educator in agronomy and horticulture; Daran Rudnick, Director of Sustainable Irrigation at Kansas State University; and Josefina Lacasa, Assistant professor of statistics at Kansas State University.

Agenda with Abstracts

Thursday, September 18

2-3:30 p.m.

Afternoon Breakout Session

Water Quality 1: Nitrate* (Ballroom)



Updates to the DWEE Predictive Nitrate Model

Bridger Corkill, Nebraska Department of Water, Energy and Environment

Assessing the role of fertilizer application practices and legacy nitrate on groundwater quality

Mikaela Cherry, USGS

Knowledge, attitudes, and awareness regarding water quality, nitrate contamination, and related health issues among Nebraska healthcare workers

Krista Brown, University of Nebraska Medical Center

Water Management* (Dodge A)



Exploring new hydrogeologic data to enhance groundwater management plans

Paul Woodward, HRD Engineering

Projecting possible downstream impacts of water futures on farm community socioeconomic conditions

Katherine Nelson, University of Missouri School of Natural Resources

Opportunities and challenges to protect and improve groundwater quality in northeast Nebraska

Brian Bruckner, Lower Elkhorn NRD

Application of general unit hydrograph model in cloud droplet size distribution for rainfall hyetograph

Junke Guo, University of Nebraska - Lincoln

3:30-4 p.m.

Break and Student Poster Competition (Nebraska Room)

Snacks will be provided

Agenda with Abstracts

Thursday, September 18

4-5 p.m.

Main Session II

Adapting Ag Water and Nutrient Management to Weather Extremes in the Great Plains (Ballroom)



Extreme weather events are increasingly disrupting water and nutrient management strategies across the rural landscapes of the Great Plains. This session, hosted by the South Dakota Water Resources Institute, will explore the real and growing challenges that producers and communities face due to unanticipated climatic shifts. Experts from Kansas, Iowa, and Missouri will share their regional insights and discuss emerging strategies in agricultural water and nutrient management under extreme weather conditions.

Vaishali Sharda, Kansas State University; Matthew Helmers, Iowa State University; Gurbir Singh, University of Missouri. Moderated by Sushant Mehan, South Dakota Water Resources Institute

5-6 p.m.

Evening Reception (Nebraska Room)

Student poster competition winners announced at 5:45 p.m.

Notes

Agenda with Abstracts

Friday, September 19

8:30 a.m. - 12:00 p.m.

Workshop

Advanced Data Analytics for Water Resources Management using R* (Chancellor's Room)



This workshop is for those who know the basic R concepts and want to improve their knowledge of R for Water Resources Management. At the end of the workshop, attendees will be able to retrieve data for your work from NOAA and USGS; perform a statistical and visual inspection of the dataset; and prepare material for a better understanding, and sharing, and be ready to go for your manuscripts.

Attendees will need a very basic understanding of R before beginning and will need to bring their laptop.

Sushant Mehan, South Dakota Water Resources Institute

8:30-10 a.m.

Keynote Panel

Case Studies in Regional Basin Management* (Ballroom)



This session will share several examples of projects that address basin management on a regional scale.

Susan Metzger, Kansas Water Institute. Kevin Wagner, Oklahoma Water Resource Center. Gaurav Jha, Kansas State University. Moderated by Andra McCowen, Kansas State University

10-10:30 a.m.

Break (Nebraska Room)

Snacks will be provided

Agenda with Abstracts

Friday, September 19

10:30 a.m. -12 p.m.

Morning Breakout Session

Water Quality 2: Wellhead Protection and Other Contaminants*
(Ballroom)



Detection of mercury in water using alfalfa nanoparticles

Amie Norton, Kansas State University

Source water protection in Nebraska

Sean Kruse, Nebraska State Source Water Protection Coordinator

Assessing groundwater quality gains from wellhead protection areas in Nebraska

Harshanee Jayasekera, Daugherty Water for Food Global Institute

Detection of 11-keto testosterone hormone in aqueous samples by molecularly imprinted photonic polymers

Tandra Biswas, University of Missouri-Columbia

Education and Outreach (Dodge A)

Emotional responses to water imagery for public engagement

Heather Akin, University of Nebraska - Lincoln

Cultivate ACCESS to data science: Equipping high school students with agriculture and water management concepts

Karisma Yumnam, University of Nebraska - Lincoln

GRIME software for ecohydrological discovery and education using ground-based time-lapse imagery

Troy Gilmore, University of Nebraska - Lincoln

Expanding engagement for conservation through farmer-led groups

Drew Kessler and Sara Mechtenberg, Houston Engineering



12-1 p.m.

Lunch (Nebraska Room)

Agenda with Abstracts

Friday, September 19

1-3:00 p.m.

Afternoon Breakout Session

PFAS* (Ballroom)



PFAS enrichment in aerosols

Jiefei Cao, University of Missouri-Columbia

Pilot-scale investigation of PFAS transport dynamics and retardation in variably saturated aquifers: impacts of intermittent and perennial flow and biochar amendment

Jiamin Mai, University of Missouri-Columbia

Mechanistic insights into electrolyte-PFAS interfacial interactions from molecular simulation and quantum chemical analysis

Gia Zhang, University of Missouri

Natural infrastructure approaches to PFAS pollution: examining treatment wetland mesocosm performance to support indirect potable reuse efforts

Robert Nairn, University of Oklahoma

Occurrence and spatial patterns of PFAS in private and public water supplies near point sources in Nebraska

Kristina Kintziger, University of Nebraska Medical Center

PFAS removal from aqueous systems: experimental and computational studies on functionalized cellulose as a sustainable adsorbent

Gema Diaz Bukvic, University of Missouri

Novel methods for PFAS removal in public water systems inspired by the conventional foam fractionation method

Pan Ni, University of Missouri

Agenda with Abstracts

Friday, September 19

Surface Water (Dodge A)



Integrating water quality monitoring from microbial to ecosystem scales

David Manning, University of Nebraska Omaha

Integrated water resources planning for waterfront development, flood mitigation, and community resilience

Zhenghong Tang, University of Nebraska-Lincoln

Pluvial flood damage exposure in a midwestern metropolitan watershed: further evidence of the prevalence of commercial flood risk

Steven Shultz, University of Nebraska Omaha

UAV-based stream velocity and discharge assessment under flooded conditions using LiDAR, photogrammetry, and PIV techniques

Jitae Do, University of Missouri

A historical analysis of riparian vegetation and channel morphology of the Platte River, Nebraska

Smriti Chaulagain, University of Nebraska-Lincoln

3:00-4:00 p.m.

Closing Session

Securing Water Professionals for Tomorrow: A student-led panel (Ballroom)



This panel will feature students from across the Great Plains as they share their experiences studying water alongside their state's water resources research institute and discuss future careers in water.

Julia Ramsay, Nebraska; Grace Roth, Kansas; Kayode Adebayo, South Dakota; Manoj Lamichhane, South Dakota; Olivia Bongiovi, Missouri.

Moderated by Rachael Herpel, Nebraska Water Center Assistant Director

4:00 p.m.

Adjourn

Poster Competition Abstracts



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Awards provided by the Nebraska Water Center

Kayode Adebayo

South Dakota State University

Machine Learning and Deep Learning Approaches for Daily Water Table Prediction

Keywords: Machine Learning, Deep learning, water table prediction.

Nour Al-janabi

University of Nebraska – Lincoln

Comparative Analysis of Nitrate Contamination and Water Governance in Nebraska, New Zealand, Denmark, and the Netherlands

Keywords: Nitrate Contamination, Groundwater Quality, Water Governance, Agriculture, International Comparison

Dilli Ram Bhattarai, Rita Khadka, and Ladya Spor Leal

University of Nebraska – Lincoln

Conservation Reserve Program and Hydrology in the Northern High Plains: An Integrated Model of Economic, Land-Use, and Hydrological Dynamics

Keywords: Conservation Reserve Program, Land Enrollment Decision, Land Use, Hydrology

Karthik Burra

University of Nebraska – Lincoln

Assessing Climate Change Impacts on Corn Yield and Irrigation Water Allocation Using MAIZSIM model

Keywords: Irrigation management, Climate change impacts, MAIZSIM model, GCM, SPI



Poster Competition Abstracts

Chi-En Chiang

University of Nebraska – Lincoln

BudCAM: An edge-computing camera system for bud detection in muscadine grapevines

Keywords: Bud burst detection, Object detection, YOLOv11, Edge computing, Precision agriculture

Kalley Collins

University of Nebraska – Lincoln

Monitoring lysimeter pore water samples in agricultural soils to quantify carbon dioxide removal of an enhanced rock weathering project deployed in Nebraska

Keywords: Enhanced rock weathering, agricultural soils, Pore water samples, carbon dioxide removal, alkalinity

Britt Fossum

University of Nebraska – Lincoln

Large-scale field application of biochar and biosolids: Impact on nutrient and contaminant dynamics

Keywords: biochar, biosolid, nitrogen, wastewater, soil carbon

Zack Hukill

Doane University

Quantification of Arsenic in Well Water Across South Eastern Nebraska

Keywords: Arsenic, Well Water, IC-ICPMS, chemistry, contaminant

Mithun Karayi

SRM Institute of Science and Technology, Kattankulathur

Distribution and Risk Assessment of Pharmaceutically Active Compounds in Surface Waters of South Indian Rivers

Keywords: PhACs, Source assessment, Antimicrobial risk, South India, Rivers

Poster Competition Abstracts

Chandan Kumar

University of Nebraska

Nitrogen Pool Dynamics and Vadose Zone Transformations During Prairie-to-Cropland Conversion

Keywords: Nitrogen, Groundwater, Irrigation, Nitrate, Native prairie, Cropland

Nishant Kumar

University of Nebraska – Lincoln

Drivers of streamflow and its components in arid regions

Keywords: Arid, Aridity index, Drivers, baseflow, explainable AI

Manoj Lamichhane

South Dakota State University

Explaining Within-Field Wheat Yield Variability in Drylands with Interpretive Machine Learning

Keywords: dryland wheat, within-field variability, early-season prediction, explainable ML, SHAP, XGBoost, management zones

Matthew Larrey

University of Nebraska – Lincoln

Do Conditions Favoring Mercury Methylating Microbes Drive Fish Tissue Methylmercury Concentrations?

Keywords: Ecotoxicology, Limnology, Microbiome, Methylmercury

Chase Lewandowski

University of Nebraska – Lincoln

Groundwater Irrigation and Its Effects on Soil Agroecosystems

Keywords: Groundwater, Microbiology, Agriculture, Soil, Agroecosystem

Kalynn Meyer

University of Nebraska – Lincoln

Real-Time In-Season Variable Rate Corn Fertilizer Application Using Canopy Sensors and UAVs

Keywords: Precision Agriculture, Nitrogen Management, Sustainable Crop Production, Resource Use Efficiency

Poster Competition Abstracts

Tulsi Pokhrel

South Dakota State University

Ecological and Economic Benefits of a Nature-Based Conservation Practice: Seasonal Riparian Area Management in Big Sioux Watershed, South Dakota

Keywords: Deferred grazing, 100-year flood plains, Nature-based solutions, Remote sensing, Water Quality, Environmental-economic benefits

Evelyn Reyes

University of Nebraska – Lincoln

Seasonal Variation and Co-Occurrence of Microplastics and Antibiotics in an Agricultural Watershed

Keywords: microplastics, antibiotics and bacteria

Anmol Singh

University of Nebraska – Lincoln

Optimizing Nitrogen Management: Impact of Source, Placement, and Timing on Corn Yield and Environmental Losses

Keywords: 4Rs, Nitrate leaching, Ammonia volatilization, Nitrogen management, Corn

Deepak Verma

Indian Institute of Technology Roorkee

Monitoring Seasonal and Long-Term Structural Dynamics of Shasta Gravity Dam Using InSAR Data and Methods

Keywords: Deformation, Monitoring, Dam, Water, InSAR

Devideen Yadav

University of Nebraska – Lincoln

Water-Smart Intercropping for Resilient Watersheds in the Indian Himalaya

Keywords: Indian Himalaya, Intercropping Systems, Rainfed Agriculture, Water Conservation, Watershed Management

2025 Great Plains Water Conference Survey

1. Please rate the Conference overall:

Poor Fair Neutral Good Excellent
Comments:

2. What was your favorite presentation/breakout and why?

3. What was your least favorite presentation/breakout and why?

4. Please rate:

Timing (day of week/date): Poor Fair Neutral Good Excellent

Location: Poor Fair Neutral Good Excellent

Facilities: Poor Fair Neutral Good Excellent

Poster Viewing: Poor Fair Neutral Good Excellent

Comments:

5. What topics would you suggest for next year's Conference?



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