



# Nebraska Water Center

Daugherty Water for Food Global Institute



2025

# ANNUAL REPORT



## The Nebraska Water Center

The Nebraska Water Center (NWC) was established by Congressional mandate as one of 54 state-based Water Resources Research Institutes in 1964. We coordinate research and programs that support the University of Nebraska as an international leader in water research, teaching, extension, and outreach.

Our fundamental goals are to:

- 1 Coordinate a wide range of research impacting water issues
- 2 Foster a deeper understanding of water and its many beneficial uses
- 3 Help develop new water researchers
- 4 Train future water researchers and engineers
- 5 Extend research results to water professionals and the public through publications, seminars and conferences, electronic media, lectures, and tours

NWC is part of the Daugherty Water for Food Global Institute (DWFI) at the University of Nebraska and part of the University of Nebraska–Lincoln’s Institute of Agriculture and Natural Resources. Financial support for NWC and the Water Sciences Laboratory comes from a combination of state, local, and federal funding, as well as through partnerships with NGOs and industry.

For more information >>> [watercenter.unl.edu](http://watercenter.unl.edu)



### NWC 2025 SNAPSHOT



**26**

Undergraduate  
Student



**23**

MS, PhD,  
and Postdoc



**\$2,178,592**

in Grants to  
Water Faculty



**27**

Journal  
Articles



**9,219**

YouTube  
Views



**2,248**

Water Current  
Readers



**23**

Events Hosted  
or Co-Hosted



The Nebraska Water Center trains students to become successful water professionals.

## »» Training Nebraska's future water professionals

In 2025, the Nebraska Water Center supported 26 undergraduate students and researchers, 12 masters students, 8 PhD students, and 3 postdoctoral researchers. These students worked and studied in water quality, vadose zone, science communication, and crop modeling.

### Undergraduate student research fellowships provide career experience in water science

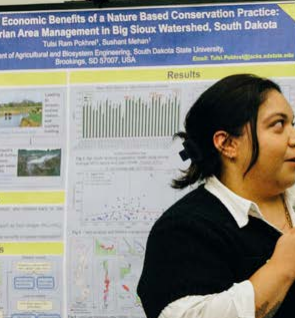
As part of its mission to train future water researchers and arrange research addressing water problems and the understanding of water, the Nebraska Water Center launched a new fellowship opportunity. Undergraduate students in Nebraska who are studying water sciences were invited to apply for the 2025 Undergraduate Student Research Fellowships to work with University of Nebraska faculty to help complete a research project leading to a publication.

Three undergraduate students were selected for the 2025 fellowship cohort and worked on research projects across campus during the summer.

Evelyn Reyes, a senior undergraduate student at the University of Nebraska-Lincoln, worked with Dr. Shannon Bartelt-Hunt on connecting anti-microbial resistance agricultural decisions and environmental systems.

"This research fellowship program has helped me tremendously, not just educationally but also in my personal life," Reyes said. "Not only have I received beneficial real-world skills in a research scenario, but I have also found my ability to take on rigorous and substantive pursuits."

Zack Hukill, a senior biochemistry major at Doane University, worked with Dr. Chris Huber and Dr. Daniel Snow to understand the different types of arsenic in water samples collected from private wells across southeast and central Nebraska.



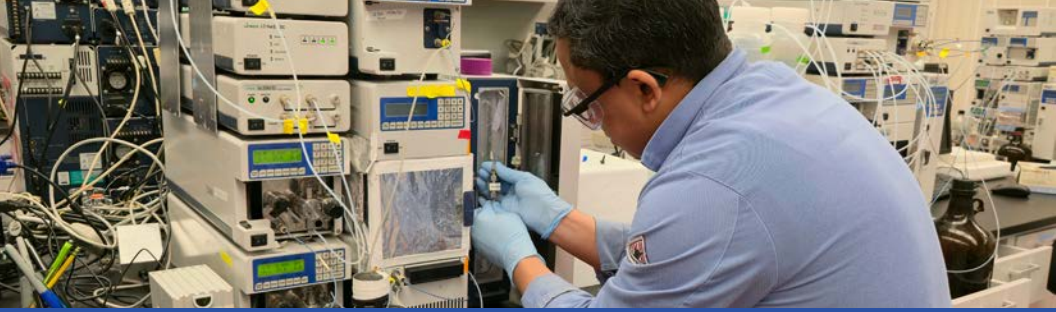
Undergraduate research fellow Evelyn Reyes presents a poster on her research.

Hukill shared the value of engaging in undergraduate research in addition to regular coursework. “The experience I have gained in the research fellowship program makes me very excited and confident in both the arsenic project and in my future senior research. Gaining experience as valuable as this is extremely difficult in a normal classroom setting and is crucial for entering the professional world.”

Chase Lewandowski, a junior plant biology and microbiology student at the University of Nebraska-Lincoln, worked with Karrie Weber to investigate the impact of the groundwater microbial community on surface soils.

“I have learned a great deal since I began this experience,” Lewandowski shared. “From developing personal skills, like lab practices and organization, to professional skills, this lab has been a great example of what is expected from a professional researcher. I feel much more comfortable communicating scientifically with my peers and colleagues, thanks to this experience.”

Learn more about the 2025 Undergraduate Research Fellows at [go.unl.edu/2025WaterFellows](http://go.unl.edu/2025WaterFellows).



A postdoctoral researcher works to improve test methods for microcontaminants through 104b funding provided by the U.S. Geological Survey.

## »» 2025 Research Publications and USGS Grants

In 2025, Nebraska Water Center researchers published 27 journal articles and scientific publications in a variety of water-related topics, including:

- › Contaminant occurrence, fate, and transformation in water systems
- › Agricultural impacts on water quality
- › Industrial and bioenergy facility impacts on ecosystems
- › Advances in analytical chemistry and environmental monitoring
- › Risk assessment and ecological effects of contaminants
- › Soil processes, contaminant mobility, and crop interactions
- › Water sustainability, policy, and management frameworks
- › Modeling and computational innovations in agriculture and hydrology

To view the full publication list and read the scientific articles, visit

»» [go.unl.edu/NWCresearch](https://go.unl.edu/NWCresearch).

## »» U.S. Geological Survey grants support Nebraska-based research projects

Each year, the Nebraska Water Center provides grant funding for research through the U.S. Geological Survey's 104b program. 104b awards are geared towards early-career faculty who are conducting research in Nebraska that has unique applications both within and outside of the state. In 2025, a total of \$75,418 was awarded.

Awards were granted to the following three projects:

- › Examining River Evolution: A Historical Analysis of Riparian Vegetation and Channel Morphology of the Platte River, Nebraska. PI Smriti Chaulagain, co-PIs Mark Stone and Aaron Mittelstet. **\$28,982**



U.S. Geological Survey 104b funds are used across the state, including research conducted near Chimney Rock National Historic Site by UNL's Panhandle Research, Extension and Education Center.

- Snow Drought in Missouri River Basin and its Hydrological Implications. PI Liang Chen. **\$27,936**
- Impact of Wetlands on Improving Water Quality in Pecan Creek and Deadman's Run. PI Jean Niwenshuti, co-PIs Derek Heeren and Aaron Mittelstet. **\$18,500**

In addition to the state-awarded 104b funds, the USGS holds a nationally competitive grant application for 104g funding. 104g funds are awarded for projects that address national priorities for USGS and can last up to three years. Nebraska has the following active 104g funds:

- Physics-based Crop, Soil, and Groundwater Modeling of Nitrate Transport to Understand and Manage Groundwater Contamination in Agricultural Regions. PI Abia Katimbo, co-PIs Sahila Beegum, Daniel Snow, Chittaranjan Ray, Sorab Panday, Arindam Malakar, Alakananda Mitra. **\$288,030**
- Release, Adsorption, and Biotransformation of Biosolid-Borne PFAS at the Water-Sediment Interface in Agricultural Watersheds. PI Xu Li, co-PIs Nirupam Aich, Daniel Snow, Michelle Lorah, Kelly Smalling. **\$278,969**
- Linking the Riverine Microbiome and Process Rates to Ecosystem Function in two Nebraska River Systems. PI Paul Ayayee, co-PIs David Manning, Jessica Corman, David Russ, Mikaela Cherry. **\$224,151**
- Using a Coupled Surface Water/Groundwater Model Informed by Groundwater Age, Geophysics, and Vadose Zone Coring to Identify Type and Placement of Management Practices to Reduce Legacy Groundwater Nitrate Concentrations. PI Aaron Mittelstet. **\$249,977**
- Nitrate Loading and Legacy Effects on Nitrogen and Carbon Cycling in Playa Wetlands of the High Plains. PI John Hribljan, co-PIs Paul Ayayee and Brian Tangen. **\$246,482**



The Water Sciences Laboratory has over 35 years of experience and provides 200+ custom and standard analytical methods.

## »» Water Sciences Laboratory impact is seen across the state

Part of the Nebraska Water Center, the Water Sciences Laboratory core facility has over 35 years of experience advancing the University of Nebraska's water and environmental research. With over \$3 million in state-of-the-art equipment, the Water Sciences Laboratory supports 200+ custom and standard analytical methods that include rigorous performance evaluation monitoring. Thousands of samples are analyzed annually with quality controls demonstrating our commitment to provide high-quality data for our clients. The laboratory is located on the University of Nebraska-Lincoln East Campus.

The Water Sciences Laboratory ended 2025 with the highest year of service center revenue on record. This success is due to offering new and unique methods, increasing prices to match comparable facilities, and growing their reputation as a state-of-the-art laboratory that could provide technical services and expertise in analytical and isotopic methods.

In March, the Water Sciences Laboratory welcomed a new laboratory manager. Jennah Duncan took on the position of manager after previously working as an intern and a technician in the lab. "Working at the Water Sciences Lab is the first job I had where I didn't dread coming to work," Duncan said. "I enjoy being here and wanted to do more and be a bigger part. I'm excited to see how the lab grows."

Learn more about the Water Sciences Laboratory at  
»» [watercenter.unl.edu/water-sciences-laboratory](https://watercenter.unl.edu/water-sciences-laboratory).

## NU president: Water science partnerships strengthen state's ag and environment

*The Water Sciences Laboratory was recognized for its contributions to Nebraska in an op-ed by the NU President. The full op-ed is available at [go.unl.edu/WaterOpEd](https://go.unl.edu/WaterOpEd).*

Every Nebraskan knows the value of water. It sustains our communities, nourishes our farms and is key for our economic prosperity. Protecting it isn't just good practice — it's our shared responsibility for Nebraska's future.



The Water Sciences Laboratory works with students, scientists, resource managers, and partners to improve water management throughout the state and beyond.

That's why the University of Nebraska, as part of its land-grant mission, is so deeply engaged in water research, education and outreach. Through the Nebraska Water Center, our faculty and students are working alongside producers, natural resources districts, businesses, scientists and communities to ensure that every drop is used wisely.

The Water Center, part of NU's Daugherty Water for Food Global Institute, pursues wide-ranging work that has major benefits for Nebraska: lower agricultural input costs, stronger yields, healthier land and cleaner water for generations to come. Producers partner with us on new strategies for irrigation efficiency. Students receive our training to test wells in rural communities. NU scientists track how water moves through soil and how components travel underground, then work with NRDs on water management strategies. Each effort points toward the same goal — helping Nebraskans better understand our state's water conditions and make informed decisions about this vital resource.

The Water Sciences Laboratory in Lincoln is at the heart of this mission. There, scientists analyze thousands of samples every year for a wide range of water-related components and indicators, providing advanced testing that scientists, producers and resource managers depend on.

And the work doesn't stop there. From monitoring toxic algal blooms in our state's recreational lakes to studying the ties between groundwater and the Platte River, our Water Sciences Laboratory is tackling challenges that affect us all. The collaborative solutions developed here ripple outward — strengthening communities, protecting ecosystems, and ensuring Nebraska agriculture remains productive for the future.

In all, the laboratory "provides Nebraska producers and water resource managers with advanced technology and solutions to help maintain our state's most strategic natural resource," explains Daniel Snow, research professor and director of laboratory services for the Nebraska Water Center.



A Know Your Well professional development workshop was held at Central Platte Natural Resources District office in Grand Island.

## »» Know Your Well builds curriculum and community impact

Know Your Well is an education and outreach program that trains high school students in groundwater science. They focus on domestic well sampling and water quality testing, while also encouraging the understanding of the factors that influence groundwater contamination. The program began in 2017 and since then students and educators from over 30 schools across Nebraska have participated, connecting classroom learning with local water quality issues.

### Educator Workshop Strengthens Statewide Implementation

On June 12, 2025, the Know Your Well team hosted a professional development workshop at the Central Platte Natural Resources District office in Grand Island, bringing together educators and regional leaders.

The workshop focused on three main goals: Update partners on curriculum development; connect teachers with local groundwater protection program partners; and provide hands-on training in well water sample collection and testing.

Participants received an overview of the Know Your Well classroom curriculum, which includes lesson plans covering water use, geology, chemistry, water-related careers, and water policy. The lessons emphasized local relevance and are structured to be easy for teachers to adopt. The curriculum was piloted in three Nebraska schools during the 2024–2025 academic year and refined using feedback from participating educators and students.

Know Your Well graduate student Sara Brock-Contreras and intern Julia Ramsay led demonstrations that allowed participants to collect samples from an on-site well and conduct their own testing.

To learn more, visit »» [knowyourwell.unl.edu](https://knowyourwell.unl.edu).



High school students work with Papio-Missouri River Natural Resources District staff to test water through the Know Your Well program.

## Know Your Well Podcast Spotlight

Know Your Well's mission goes beyond classrooms into other educational resources, like the Water for Food Podcast.

In the October episode of the Water for Food Podcast, Communications Specialist Arianna Elnes explores a unique initiative that puts water quality testing directly into the hands of high school students across Nebraska. Sara Brock-Contreras, a PhD student advised by Dr. Dan Snow, joins Arianna to discuss her work on the Know Your Well program — an innovative educational and participatory science effort that equips students with the tools, training, and confidence to test domestic wells in their communities.

Through hands-on learning, students gain a deeper understanding of water quality, local geology, and science communication while generating real data about local water quality. Sara shares how this interdisciplinary program is inspiring and engaging the next generation of water leaders. Know Your Well is a signature part of the Nebraska Water Center.

To listen to the podcast episode, visit [»» go.unl.edu/WaterForFoodPodcast](https://go.unl.edu/WaterForFoodPodcast).



Water Tour attendees learn about irrigation methods from an eastern Nebraskan farmer.

## »» **Spring Seminar Series features innovations driving safe and secure water**

The Spring Water Seminar Series was held again in 2025. This seminar series is offered as a one-credit hour undergraduate/graduate course in UNL's School of Natural Resources and is open to the public. The 2025 seminar theme was Innovations Driving Safe and Secure Water. The following speakers presented during the seminar series:

- > January 29 – Daryl Andersen, Lower Platte North NRD
- > February 5 – Katie Cameron, Eastern Nebraska Water Resources Assessment
- > February 19 – Nirupam Aich, UNL
- > March 12 – Syed Mubeen, Paniclean
- > April 2 – Peter Goffman, Cary Institute
- > April 16 – Sanjai Parikh, UC Davis
- > April 23 – Arindam Malakar, UNL

The Nebraska Water Center's long-running series began in 1968 as a spring semester program for students, faculty, water professionals and the public to hear experts address current water issues and provide a forum for thoughtful discussion.

Seminars were recorded and are available at »» [go.unl.edu/WaterSeminar](https://go.unl.edu/WaterSeminar).

## »» **One-Day Nebraska Water Tour**

In May 2025, the Nebraska Water Center hosted a one-day Nebraska Water Tour as part of the Water for Food Global Conference, offering local and international attendees a look into water management in eastern Nebraska.

Participants learned about irrigation practices and water management strategies shaped by local aquifer availability, including subsurface drip irrigation and UNL's Highboy Cover Crop Interseeding Project. The tour also included a visit to Lake Wanahoo and the Eastern Nebraska Research, Extension, and Education Center (ENREEC).



Students from Nebraska, Kansas, South Dakota, and Missouri spoke at the Great Plains Water Conference.

The water tour combined field-based learning with discussion of policy, research, and on-the-ground management to highlight Nebraska's integrated approach to water resources.

## »» **Crop Modeling Workshop at the Water for Food Global Conference**

As part of the 2025 Water for Food Global Conference, the Nebraska Water Center and the USDA-ARS Adaptive Cropping Systems Laboratory (ACSL) hosted a half-day crop modeling workshop.

The workshop focused on agricultural systems applications and introduced participants to the Crop Land And Soil SIMulation (CLASSIM) interface, a graphical user interface developed by USDA-ARS to simplify access to advanced crop and soil models. Representatives from Natural Resources Districts, state agencies, environmental engineering firms, and universities participated in the workshop. They received training on CLASSIM interface operation and education on how crop simulation models can inform research and management decisions.

## »» **Great Plains Water Conference**

The Nebraska Water Center hosted the 2025 Great Plains Water Conference September 18 and 19 at the University of Nebraska Omaha campus. This regional event brought together 163 attendees and 61 speakers from eight states, including Nebraska, Kansas, Oklahoma, Iowa, Missouri, South Dakota, North Dakota, and Minnesota.

The theme was Securing Water Resources for Tomorrow and featured sessions on water-smart communities and watersheds, water quality monitoring and treatment strategies, emerging contaminants, wellhead protection, basin management, and education and outreach. Researchers, government agencies, nonprofits, students, and water professionals spoke about how communities across the Great Plains are planning for future water needs.

A student research poster competition provided an opportunity for students to present their work and engage with water professionals from across the region.

Videos from conference sessions are available at »» [go.unl.edu/WaterConference](https://go.unl.edu/WaterConference).



Master Irrigator provides producer-directed educational sessions throughout the state.

## »» Nebraska's Master Irrigator program equips growers to lead irrigation innovation

The University of Nebraska launched Master Irrigator in Nebraska, a producer-directed comprehensive educational series focused on taking irrigated acres to the next level.

A series of Design Summits were hosted across Nebraska to bring together farmers, industry, extension, and policy partners and were led by Crystal Powers, DWFI/ Nebraska Water Center Water and Cropping Systems Extension Educator. The summits provided discussions around educational needs across the themes of taking your irrigated acres and soil to the next level, protecting Nebraska's soil and water, and transforming data into decisions.

The goal of the Nebraska Master Irrigator program is to provide farmers with locally relevant insights into innovations from industry, policy, and research. Each session highlighted resources from UNL's Testing Ag Performance Solutions (TAPS) program, the USDA Natural Resources Conservation Service, Nebraska's Natural Resources Districts, and other industry leaders. These highlights were followed by discussions among growers to refine program development, said Powers.

The goal of the program is to meet the needs of the state's top irrigators, said Derek McLean, dean and director of UNL's Agricultural Research Division. Nebraska's Master Irrigator program will cater to those seeking to elevate their fields to the next level.

"Nebraska producers are extremely knowledgeable about irrigation and nutrient management," McLean said. "What we're hearing is a desire for more opportunities to interact with peers and industry leaders on the latest advances in water management and irrigation technology. In a state like Nebraska, the futures of irrigation management and precision agriculture are inextricably linked, and we have a role to play in shaping what that looks like."

Three design summit sessions crossed the state in 2025 to share previews of different topics and gain insights from different regions about key issues affecting Nebraska's irrigated cropping systems. Ninety-eight participants joined in the discussion, providing hundreds of suggestions. Nearly 9 out of 10 participants said they will take action on what they learned through the summits.



## Our Impact

NWC was established by an act of Congress in 1964. Part of the Daugherty Water for Food Global Institute, we coordinate research and programs that support the University of Nebraska as an international leader in water research, teaching, extension, and outreach.

Learn more >>> [watercenter.unl.edu](http://watercenter.unl.edu)

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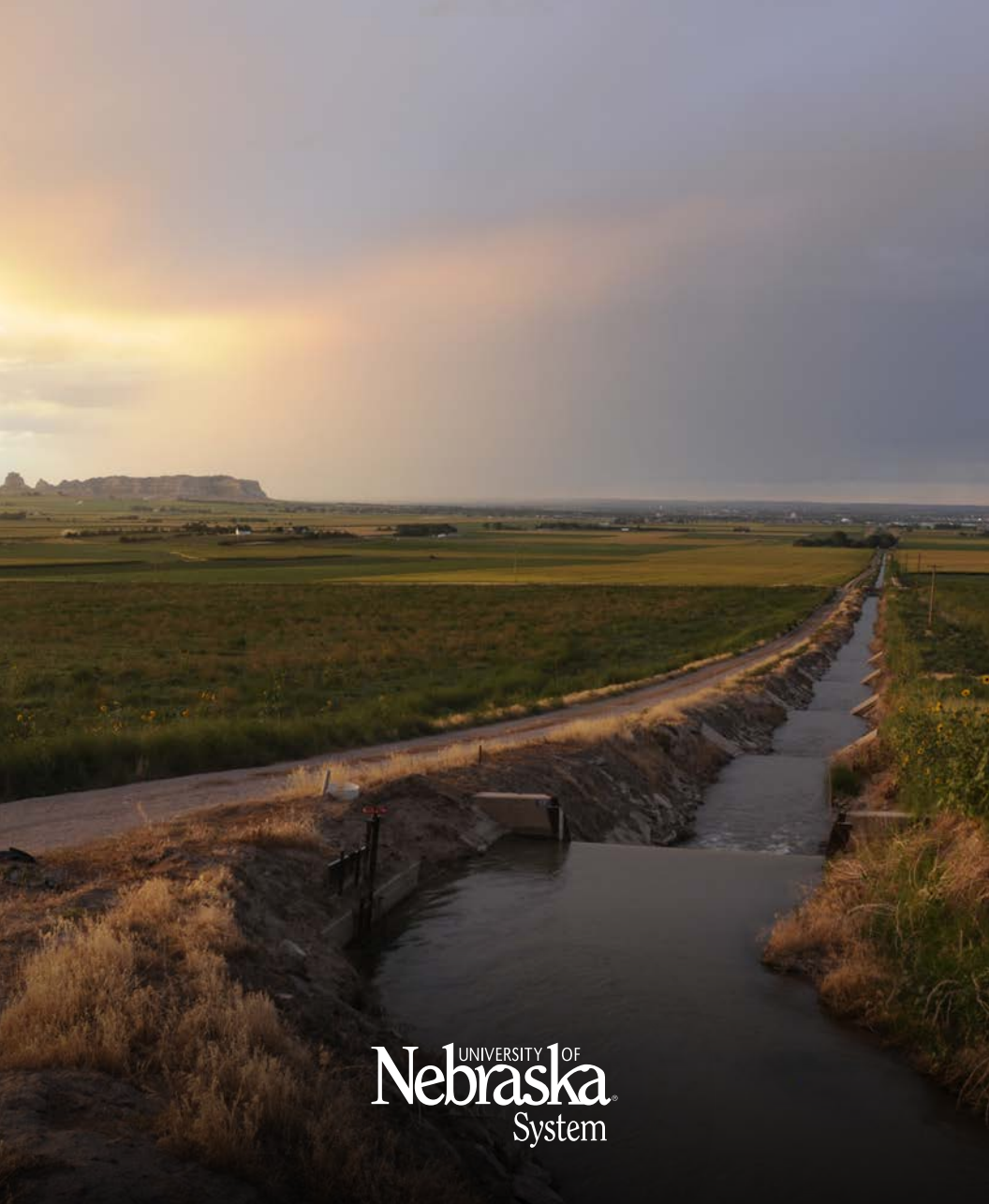
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