

# WATER

# CURRENT

NEBRASKA WATER CENTER  
PART OF THE ROBERT B.  
DAUGHERTY WATER FOR FOOD  
GLOBAL INSTITUTE AT THE  
UNIVERSITY OF NEBRASKA  
SUMMER 2019 VOL. 51, NO. 1

## NWC Summer Spotlight: New Research, Events and Impacts



A center pivot irrigates a corn field on a summer day in southwest Nebraska's Perkins County.

Dear Reader,

It's been a while!

A few big ventures have diverted us from our regular Water Current publication schedule. By now you've hopefully received one of those ventures: our 2017-2018 Annual Report. If not, we've reprinted an article here about our Know Your Well Project that originally appeared in the report. Two other big lifts are the 2019 Water and Natural Resources Tour in September to Wyoming and Montana and the Fall Water Symposium in October in Norfolk. More information on both of those events are in these pages.

While those events are on the horizon, we also reflect on past events in this issue, such as our annual spring seminar series and first ever Water Sciences Laboratory lunch and learn. Plus, we're at a land-grant university, so loads of cool research abounds, right? Spotlighted here are a couple of recent projects.

We also have not published since the devastating flooding this spring across much of the state. While the recovery is ongoing — and will be for some time — the NWC and University of Nebraska are committed to doing our part. I would point people looking for more information and ways to help to [flood.unl.edu](http://flood.unl.edu).

Yours,

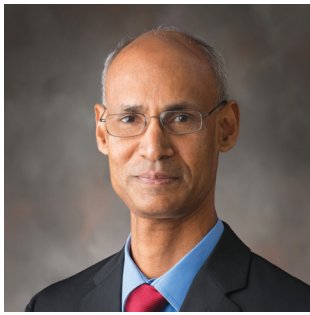
A handwritten signature in black ink that reads "Jesse Starita".

Jesse Starita  
Editor, Nebraska Water Current



**Nebraska  
Water Center**

Daugherty Water for Food Global Institute



# NWC Projects and Programs Are Heating Up

From the Director  
**Chittaranjan Ray, Ph.D., P.E.**

In case we needed a reminder of how formidable water is, Midwesterners got one the second week of March. The severe, record-breaking floods across much of the state battered lives, livestock, fields and futures. Now that a few months have passed, the flooding has made me, as a water professional, feel humbled. While we lament the losses, we should also recognize this as an opportunity to ask big questions: What can we do to prevent the worst elements of future flooding? How prepared is our state for the next disaster? Where and how can our center provide help in this regard?

Looking forward, our fall conference will be October 9-10 at the Divots Conference Center in Norfolk. Entitled "Building a Clean Water Future in Northeast Nebraska," the conference will bring together leaders in water and ag for stimulating conversations around public health, water quality, innovative solutions and community engagement. We look forward to engaging our Natural Resources Districts (NRD) partners, as well as area high schools, community leaders, state agencies and faculty experts. Please mark your calendars and check out the flyer on page 12.

While we're in the neighborhood, I am pleased to highlight in these pages two developments in the Bazile. This spring, the Nebraska Environmental Trust committed \$647,500 for the Bazile Groundwater Management Area (BGMA) NRDs, Nebraska Department of Environmental Quality, University of Nebraska Extension and the Nebraska Water Center to develop three advanced nitrogen and water management research and demonstration sites, conduct annual field days and educational

meetings and provide an analysis of the success of various water and nitrogen application methods (p.6). We are pleased to also welcome Jeremy Milander who recently assumed his role as assistant extension educator for the BGMA. Jeremy is developing an educational program aimed at stabilizing nitrate concentration in groundwater, and will work on the NET-funded demonstration sites.

By now you should have also received our 2017-2018 Annual Report. The 40-page report covers two years' worth of NWC research, extension and outreach, and teaching activities. In that time, the Know Your Well project has grown considerably and now includes 19 high schools across the state. A reproduction of the Know Your Well article from our report appears on page 4. In addition, this year, the project received an additional Nebraska Environmental Trust grant to include BGMA area high schools.

On the staffing front, I am pleased to welcome Rajneesh Singh to the NWC. Rajneesh is a native of India and recently completed his Ph.D. at one of the prestigious Indian Institutes of Technology. He will be with us for at least one year examining vermifiltration and other treatment technologies for the treatment and reuse of effluent from agriculture, food, and animal production systems. Rajneesh will be working with Professors Shannon Bartelt-Hunt and Matteo D'Alessio.

Lastly, we are looking forward to our annual Water and Natural Resources Tour. This year's tour, September 15-19, will visit the Yellowstone and Missouri River Basins in Wyoming and Montana. Read more about the tour on page 5.

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[watercenter.unl.edu](http://watercenter.unl.edu)





## Water Sciences Laboratory Update

**Tania Biswas, Ph.D.**  
WSL Research Lab Manager



WSL separations chemist David Cassada explains the lab's instruments during a tour for the Feb. 15 Lunch and Learn Event.



Three Rwandan CUSP scholars share their experiences as WSL interns at the Feb. 15 Lunch and Learn.

2018 was a successful and record-setting year for the Water Sciences Laboratory (WSL). We analyzed more than 10,000 samples for our clients in academia, government and industry. We trained 35 students and lab users under our new training program. We generated more than \$250,000 of income. We hosted 150 visitors who toured our facilities. With such a great year behind us, the WSL is perfectly positioned for another successful year.

We bid farewell to our undergraduate interns from last year. Two of them are graduating from UNL this spring, while others have moved on to other opportunities. We are proud of their achievements and pleased that their internships at our laboratory benefitted them professionally and better positioned them for future careers.

We are excited to have many new student interns this year. To date, we have recruited four new student interns with diverse backgrounds in science and engineering. They are currently undergoing the WSL training program and will eventually assist staff with a variety of laboratory-related tasks. As we did last year, we're hosting three new Rwandan undergraduates from UNL's Integrated Sciences program as part of their summer experiential learning. Their peers — volunteers in our lab last year — recommended them. These student endorsements validate our positive impact on young water researchers.

The WSL organized a Lunch and Learn event this February to promote the facility and its analytical capabilities to water and environmental professionals and stakeholders. Over 50 professionals from various fields in academia, state government and industry attended. WSL director Dan Snow hosted the event and senior chemist Dave Cassada and research technologists Tong Onanong and Aaron Shultis gave technical presentations on major core technologies such as environmental mass spectrometry and isotope ratio mass spectrometry. I delivered the concluding presentation, summarizing both the 200+ analytical methods we offer and the new training program that we launched last year for our lab users.

Meanwhile, students from the iSTEM academy of Metropolitan Community College visited our facility in April as part of their educational program. I conducted a seminar, followed by a facilities tour and instrument demonstration. Students from UNL's School of Natural Resources and Nebraska's Newman Grove High School also visited us in April.

After an eventful start to 2019, the WSL is preparing for a busy summer ahead.

# Know Your Well: Trickledown Effects of Hands-On Water Education

Scientists haven't always successfully communicated knowledge to the public, and it sometimes keeps communities from taking action to protect and manage resources. When it comes to groundwater and community drinking water, that gap is being filled within several Nebraska communities by a three-year Water Sciences Laboratory (WSL) citizen science program called Know Your Well.

In 2017 and 2018, Chris Olson, the program's manager, drove 17,000 miles to meet with students and teachers in 10 Nebraska towns to help them understand and participate in the science of groundwater and drinking water. The program, supported by the University and a Nebraska Environmental Trust (NET) grant, provides testing kits and teaches students to test their own communities' well water, analyze it, and then compare results with duplicate samples sent to WSL water scientists. Olson said the value of hands-on learning, as opposed to classroom lectures, is immeasurable.

For the past year, Nicole Schumacher, a UNL undergraduate student in environmental engineering, has assisted Olson and managed the program's social media. "I've learned a lot about groundwater and water sampling, and it will help me in my future work," she said.

According to Olson, program benefits go beyond testing and student education. Citizen science programs help scientists collect valuable data in higher quantities than they could gather on their own. Also, students are encouraged to share results through community presentations, allowing the program to spill over into policymaking to help community leaders make important water-related decisions.

"This program helps water users understand what's going on in their own communities without preaching to them," Olson explained. "That means people are more likely to understand the problems and help implement treatment — it gives everyone an opportunity to be a part of the solutions."

A happy side-effect of the program is cultivation of interest in water-related careers. Faith Santana is one such student from Auburn, Nebraska. This fall, she'll be studying water sciences at UNL. "Before taking part in this program, I never would have given thought to what is in water," Santana said. "It changed the way I look at things."

In 2019, the Know Your Well program will guide student testing in nine more Nebraska communities. However, Olson said testing drinking water is not a skill needed only in Nebraska. "Everyone needs water," he explained. "From those who drink it to those in agriculture who rely on it to grow our food." He believes the Know Your Well program and lessons learned could be expanded to communities anywhere.

“ Before taking part in this program, I never would have given thought to what is in water. In fact, I wouldn't have thought it was interesting when it really is. Being informed of water quality gives people the ability to focus on what they can change to help themselves or their land. ”



Auburn High School Senior Faith Santana. Her participation in Know Your Well inspired her to major in water and natural resources at the University of Nebraska-Lincoln.

*Editor's Note: This article first appeared in the Nebraska Water Center's 2017-2018 annual report. To read the full report, visit [go.unl.edu/nwcanualreport](http://go.unl.edu/nwcanualreport).*



# 2019 Water Tour Goes West to Big Sky Country

By Jesse Starita

The panoramic vistas of Yellowstone National Park and Montana's "Big Sky Country" are the backdrop for the 2019 Nebraska Water and Natural Resources Tour.

Organized by the Nebraska Water Center (NWC) and Central Nebraska Public Power and Irrigation District (CNPPID), the 48th annual tour runs September 15-19 and begins and ends in Billings, MT.

The tour kicks off with a welcome reception in Billings the evening of Sunday, September 15. The following morning participants will travel to the University of Wyoming's Research and Extension Center in Powell. Featured stops in the afternoon include the historic 350-foot Buffalo Bill Dam and the Buffalo Bill Center of the West in Cody.

Tuesday, September 17 will be dedicated to exploring Yellowstone National Park. Shane Doyle, a member of the Crow Tribe and a regional expert, will guide the tour through stops on scenic trails, hot springs and iconic features like Old Faithful Geyser. The day will conclude with time for dinner and shopping in West Yellowstone, the park's gateway town.

The next day the tour moves north to Gallatin County and Big Sky Resort. The area offers a multitude of water issues and participants will explore how water is shared and managed amongst ski resorts, ecosystems, municipalities, and golf courses. In the afternoon, the tour will travel to Bozeman to meet with representatives from the Association of Gallatin Agricultural Irrigators (AGAI) — an organization that advocates and protects water rights of the farming community.

The tour's final day — Thursday, September 19 — will begin at the headwaters of the Missouri River outside Three Forks, MT. Following that, the tour turns east following the Musselshell River basin which has seen three 100-year floods in the past five years. A panel of local water managers, scientists and policymakers will discuss water management in an era of increasing weather extremes. The bus returns to Billings Thursday night to conclude the tour.

All tour participants are responsible for their own airfare/travel to and from Billings.

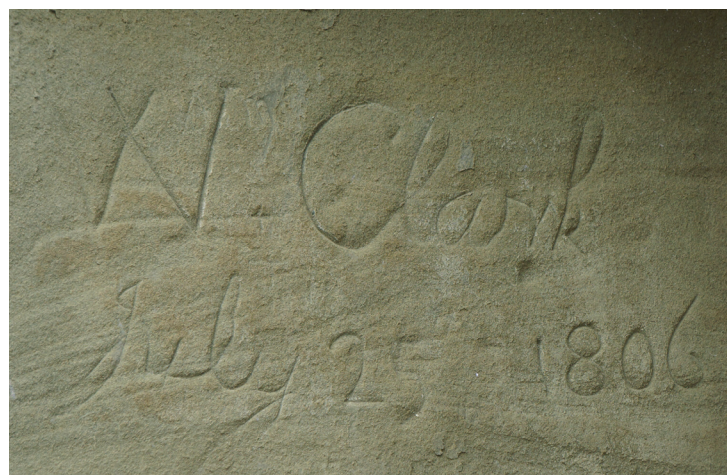
Check our websites for detailed information as the tour approaches: [watercenter.unl.edu/water-tour](http://watercenter.unl.edu/water-tour) and [cnppid.com/summertour](http://cnppid.com/summertour).



The tour will visit Buffalo Bill Dam outside Cody, WY. At the time of its completion in 1910, it was the tallest dam in the world.



NWC PR and Engagement Coordinator Jesse Starita, NWC Program Assistant Tricia Liedle and CNPPID Government and Public Relations Manager Jeff Buettner at the east entrance to Yellowstone National Park.



William Clark of the Lewis and Clark Expedition carved his name into Pompey's Pillar, a tour stop and rock outcropping outside Billings, MT.

# Bazile Groundwater Management Area Receives Grant from Nebraska Environmental Trust

This press release is courtesy of Sheila Aikanathan-Johnson, Public Information Officer with the Nebraska Environmental Trust.



Nebraska Environmental Trust for the “Development of Research and Demonstration Sites in the BGMA for Groundwater Nitrate Reduction” project. The Trust Board announced funding for the project at its meeting on April 4, 2019 in Lincoln. This is the first year of award with a potential for 2nd and 3rd year funding totaling \$209,500 and \$209,500 respectively. The project is one of the 117 projects receiving \$19,501,444 in grant awards from the Nebraska Environmental Trust this year. Of these, 85 were new applications and 32 are carry-over projects.

Located in northeastern Nebraska, the Bazile Groundwater Management Area (BGMA) was formed collaboratively between the Lower Elkhorn Natural Resources District (NRD), Upper Elkhorn NRD, Lower Niobrara NRD, Lewis and Clark NRD, and Department of Environmental Quality to address high nitrate levels in the area. Since its formation in 2013, the BGMA has been dedicated to increasing education of agricultural producers and increasing the implementation of best management practices. To further this effort, the BGMA has partnered

Lincoln, NE — April 4, 2019 — Bazile Groundwater Management Area announced today that it will receive \$228,500 from the

with the University of Nebraska–Lincoln Extension and the Nebraska Water Center, part of the Daugherty Water for Food Global Institute at the University of Nebraska to design the proposed project. This project will develop three advanced nitrogen and water management research and demonstration sites, conduct annual field days and educational meetings, and provide an analysis of the success of various water and nitrogen application methods utilized. Through innovative education and demonstration, this project will encourage widespread adoption of improved practices, positively impacting ground and surface water quality and soil management. This project is a vital step forward in stabilizing, and eventually reducing, nitrate levels within the BGMA as experts in natural resource management, with the help of NET, target this serious issue.



The Nebraska Legislature created the Nebraska Environmental Trust in 1992. Using revenue from the Nebraska Lottery, the Trust has provided over \$305 million in grants to over 2,200 projects across the state. Anyone — citizens, organizations, communities, farmers and businesses — can apply for funding to protect habitat, improve water quality and establish recycling programs in Nebraska. The Nebraska Environmental Trust works to preserve, protect and restore our natural resources for future generations.

## Introducing New Bazile Groundwater Management Area Extension Educator



Jeremy Milander is the university's new assistant extension educator in the Bazile Groundwater Management Area.

Please welcome Jeremy Milander to Nebraska Extension. Jeremy will assume his new role as an Assistant Extension Educator in mid-April and will have specific responsibilities in the Bazile Water Management Area in northeast Nebraska. He will work with four Natural Resources Districts to develop an educational program aimed at stabilizing the nitrate concentration in ground water. Jeremy will also work with a stakeholder group to implement field demonstrations funded by a Nebraska Environmental Trust grant.

Jeremy grew up near Coleridge, NE and earned his bachelor and master of science degrees in Agronomy at UNL. His master's work included assessing the impact of management practices on the yield components of corn. He has worked with the soil science program at the Haskell Ag Lab for the past two years where he assisted with a cover crop study and a long term tillage and crop rotation study.

Jeremy's office will be located at the Lower Elkhorn NRD Office in Norfolk, located at 1508 Square Turn Blvd. He can be reached at 402-371-7313 and [jeremy.milander@unl.edu](mailto:jeremy.milander@unl.edu).



# Research Corner

## Nebraska Researchers Look at Factors Encouraging Participation in Conservation Stewardship Program



Mark Burbach



Simanti Banerjee

University of Nebraska–Lincoln researchers Simanti Banerjee and Mark Burbach recently co-authored a fascinating paper on how to encourage farmers' participation in the Conservation Stewardship Program, or CSP. Alongside collaborators at the University of Michigan–Dearborn, the duo found that personalized letters with a handwritten phrase had the largest impact on increasing the enrollment rate of farmers into the CSP program. The full paper is available through [journals.elsevier.com/ecological-economics](http://journals.elsevier.com/ecological-economics).

### Abstract

In this paper we present the results of a field experiment on encouraging farmers' application for agri-environmental schemes, specifically the Conservation Stewardship Program (CSP) that is administered by the U.S. Department of Agriculture at the state level. We sent different versions of a recruitment/enrollment letter to agricultural producers in 36 Nebraska counties with historically very low levels of CSP enrollment. We found that the letters doubled the uptake rates as compared to the control (no letter) population. Personalized letters with a handwritten phrase appealing to people's empathetic tendencies toward environmental conservation — an empathy nudge — had the largest impact. When the same nudge was photocopied,

it performed statistically significantly worse than handwritten and somewhat (statistically insignificant) worse than a standard letter. The experimental results suggest that the USDA can double the application rate at a cost of only \$58–116 per farm. If the money spent on sending letters were instead directed toward increasing financial incentives, it would be cost-equivalent to adding 2.5–5 cents per acre per year to CSP payments. During the time of the experiment, the CSP payments in the state were on average \$6.8/acre for rangeland and \$24/acre for cropland per year, and extra 2.5–5 cents per acre per year is unlikely to affect the decision of a farmer to apply. As such, from an agri-environmental policy perspective, using personalized letters is highly cost effective.

## How Can Nitrogen Budgeting Estimate Nitrate-N Loading to Groundwater?

By Daniel Miller, USDA-ARS, Agroecosystem Management Research Unit; Daniel Snow, University of Nebraska Water Sciences Laboratory; and Brian Krienke, University of Nebraska Department of Agronomy and Horticulture



Increasing nitrate-N concentrations in groundwater has become a national issue. This problem gained recognition in Nebraska during the 1960's as associated with fertilizer-N use and irrigation practices, and even now remains largely unresolved because of the complexity and scale of land use. Nitrogen (N) budgeting, where accounting principles are applied to measured quantities of individual N sources, is one tool for understanding how long-term fertilizer-N use and irrigation contributes to this problem. Nitrogen budgeting can be used in developing a framework for N management so that crop production can continue with minimal impact on water quality. Here, we explore this tool by going through commonly-used conversions and calculations for N supply and nitrate-N leaching.

Read more at <https://go.unl.edu/nitrogenbudgeting>.

## Nebraska's Natural Resource District System: Collaborative Approaches to Adaptive Groundwater Quality Governance

By J. David Aiken, University of Nebraska Department of Agricultural Economics; Gregory Sixt, Massachusetts Institute of Technology; Laurens Klerkx, Wageningen University; and Timothy Griffin, Tufts University



J. David Aiken

Nonpoint source pollution of groundwater by nitrates from agricultural activity is a persistent problem for which developing effective policy approaches has proven difficult. There is little empirical

information on forms of governance or regime attributes that effectively and sustainably address agricultural nonpoint source pollution of groundwater. Nebraska's Natural Resource District (NRD) system is a rare example of a groundwater governance regime that is putting programmes in place that are likely to generate sustainable groundwater quality outcomes. We focus on three groundwater nitrate management programmes in the state that collectively represent the broader NRD system. The research shows that four elements of Nebraska's groundwater governance regime are fundamental to its success in addressing groundwater nitrates: 1) the local nature of governance, which builds trust among stakeholders; 2) the significant authority granted to the local districts by the state, allowing for the development of locally tailored solutions; 3) the collaborative governance approach, which allows potential scale imbalances to be overcome; and 4) the taxing authority granted to NRDs, which enables them to fund locally tailored management solutions.

Read more at <https://go.unl.edu/nebraskanrd>.



# Study Evaluates Effect of Drought Crop Prices and Local Management on Groundwater Decline

By Frances Hayes, Communications Specialist, Daugherty Water for Food Global Institute



A new study is one of the first to use segmented regression to study changes in water table elevation trends. Researchers set out to evaluate the effects of droughts, crop prices and local groundwater management on tipping points in groundwater decline, particularly across the High Plains Aquifer. Previous studies assigned a linear or logistic regression to the decline, suggesting that depletion is inevitable and extending the life of the aquifer would be difficult or impossible. However, by finding breakpoints in the

data, the new study suggests there are opportunities to enhance the lifespan of the resource through improved management.

Researchers from the Nebraska Water Center, Michigan State University and the University of Florida found that when conditions were excessively dry, wells declined faster. When corn prices were extremely low, there was recovery or slowing of decline. “This is likely because farmers determined that the cost of irrigation was too high when compared to the crop value,” said Erin Haacker, lead author and research associate at the Nebraska Water Center. “As one would expect,” Haacker said, “much wetter conditions were also associated with recovery.”

According to the report, when water management districts were first established, the area saw water tables decline rapidly or recover much less quickly. One reason for this may be because pumping restrictions are often based on historical rates of pumping in the area. Five years or more after the district was established, the water tables saw recovery or declined less rapidly. Based on these findings, researchers estimate that both establishment of management districts and faster declines in water tables are associated with drought.

The study explored thresholds for changes in water table elevation trends to inform predictions of the pattern of decline and recovery. Despite the critical role groundwater plays in providing water for irrigation, groundwater management is not as established as surface water management in the U.S. and elsewhere. However, these management districts sometimes impose pumping restrictions or other regulations that could affect water table elevations.

Researchers studied an 82-year record of water table data from the High Plains Aquifer and 41 groundwater management areas within it. The High Plains Aquifer is the source for nearly a third of all groundwater used for irrigation in the U.S., and 98% of water extracted from it is used for irrigation. Researchers note that the institution of pumping restrictions by management areas is relatively recent and highly variable across the aquifer. Haacker said the research may be useful in future studies that would evaluate the effectiveness of programs in which irrigators voluntarily imposed pumping limits.

*This work was supported by the US Department of Agriculture [USDA-NIFA 2016-68007-25066; USDA-NIFA 2015-68007-23133] and the National Science Foundation [NSF 1039180]. Any opinions, findings, and conclusions or recommendations expressed here are those of the authors, and do not necessarily reflect the views of the USDA or NSF.*

*Full article: <https://doi.org/10.1016/j.agwat.2019.04.002>*



A new study by NWC research associate Erin Haacker evaluated the effects of droughts, crop prices and local groundwater management districts on tipping points in groundwater decline.



# Fourth Cohort of WARI Scholars Arrive in Nebraska

By Jesse Starita

The fourth cohort of Water Advanced Research and Innovation (WARI) Fellows began arriving this spring. WARI is a joint program between the Indo-US Science and Technology Forum, Government of India's Department of Science and Technology, the University of Nebraska–Lincoln and the Daugherty Water for Food Global Institute. The program builds capacity for students and scholars from India's top academic institutions to address global water quality challenges.



WARI scholar Kausik Ghosh with Dr. Francisco Munoz Arriola (L) and members of his hydroinformatics lab at UNL's Biological Systems Engineering Department.

Seven Ph.D. students and one faculty member comprise this year's cohort. They will be mentored by Nebraska water science faculty from across the university system, including the Water Sciences Laboratory, National Drought Mitigation Center, Nebraska's School of Natural Resources, School of Biological Sciences, and departments of Civil Engineering and Chemical & Biomolecular Engineering. WARI scholars will spend three to six months in Nebraska after arriving this spring.

In 2020, the program plans to expand and partner with Purdue, Texas Tech and the University of Idaho. Nebraska will remain the lead institution, but scholars will have the option to join one of the other universities based on shared interest and expertise. Some 15 faculty at partner schools have already signed up to be WARI mentors. For more information on the program, visit [waterforfood.nebraska.edu/resources/wari-program](http://waterforfood.nebraska.edu/resources/wari-program).



WARI scholars Himani Uppal (L) and Tanushree Parsai in the UNL Civil Engineering lab. Both are Indian Ph.D. students spending this summer with Drs. Yusong Li and Xu Li researching innovative engineering techniques to improve water quality.

## Rajneesh Singh joins NWC as Postdoctoral Fellow



Rajneesh Singh joined NWC as a postdoc this spring. Pollution along the holy Ganges River in his native India inspired him to take up wastewater treatment as a career.

Rajneesh Singh joined the Nebraska Water Center in April 2019, after submission of his Ph.D. thesis in Civil Engineering from the Indian Institute of Technology, Bhubaneswar, India. He earned his postgraduate degree (M. Tech., Agricultural Engineering) from the Indian Institute of Technology, Kharagpur. He works on the facilitation of natural, sustainable and affordable technologies, focusing on the treatment of wastewaters generated from many industrial and agricultural unit operations.

Raised between the cities of Varanasi and Allahabad in northern India, he frequently visited the sacred Ganga River ghats in his early days. Witnessing the plight of the Ganga River due to the discharge of domestic and industrial effluents in its long

course of the run, Singh took up research on wastewater treatment as his career. He began working on it from his days at IIT Kharagpur, where he worked on remediation of aquacultural wastewaters by improvising trickling filters to offer higher denitrification. During his Ph.D., he worked on vermifiltration — another green and affordable wastewater treatment technology — and encountered the limitations associated with the vermifilters to take it from labs to field. His work focused on increasing the lifespan of vermifilters and facilitation of a mathematical tool for the design and scaling up of vermifiltration-based treatment plants.

In his postdoctoral assignment at UNL, he is expected to deliver solutions on emitter clogging of subsurface drip irrigation systems using wastewaters from agricultural farms.

# NWC Goes to Washington D.C. for Capitol Hill Visits, Networking

By Jesse Starita

Every winter, the National Institutes for Water Resources (NIWR) hosts its annual meeting in Washington D.C. The three-day event convenes Water Resources Research Institute (WRRI) directors and staff to network and advocate on Capitol Hill for funding to continue their institutes' work. This year's meeting took place February 24th — 27th at the Intercontinental Hotel in the up-and-coming Wharf District.

NWC director Chittaranjan Ray and PR & engagement coordinator Jesse Starita represented the center at the meeting. Day one featured an abundance of presentations by Water Center directors, USGS leadership, and NIWR lobbyists and culminated in a top floor dinner reception at Van Scoyoc Associates, NIWR's government affairs firm.

Day two was even busier. After a morning session at the hotel, attendees scattered throughout the halls of Congress to meet with their state delegation. On Tuesday afternoon, Ray, Starita and University of Nebraska federal relations coordinator Jacob Dowd visited the offices of Congressman Don Bacon and Adrian Smith. These meetings are opportunities to educate Congressional staff on NWC activities and advocate for reauthorization of the Water Resources Research Act. This act provides crucial funding to the 54 WRRIs in each state and U.S. territory. That evening, Ray and Starita shared dinner with Alan Kolok, the longtime UNO biology professor who now directs the University of Idaho's Water Center.

California Congressman Jim Costa opened the final day with a captivating discussion. At the time of his election, Costa was the youngest member of the California State legislature at age 26. In Congress, Costa represents District 16, a largely agricultural area in the San Joaquin Valley. While Starita gave a lightning talk at the conference about the Water Sciences Lab, Ray attended the weekly Nebraska breakfast at the Capitol and caught up with Rep. Jeff Fortenberry. Later in the day, NWC returned to The Hill for visits to the offices of Senators Sasse and Fischer.

For more information about NIWR, visit [niwr.info](http://niwr.info).



NWC PR & engagement coordinator Jesse Starita refuels with coffee before a meeting on Capitol Hill.



Top: Chittaranjan Ray, Alan Kolok and Jesse Starita in Washington D.C.'s Wharf District  
Bottom: California Congressman Jim Costa giving remarks at the 2019 NIWR Conference.





## The Ebb and Flow

### Crystal Powers

Research and Extension Communication Specialist, NWC

As I rolled into Pacific Junction, IA last weekend my heart was breaking for this community, devastated by nearly five weeks of up-to-the-eaves-water from a flooded Missouri River. I was there to help my grandparents and uncle recover what little they could. Three days into cleanup, the piles of destroyed personal belongings were above my head along all the streets as the houses were being gutted. A week of water had done the same closer to home in Ashland along the Platte, where we had already volunteered for parts of the first two weeks.

As I traveled Northeast Nebraska this week, homes, businesses, roads, fences, and rivers are all still in flux. Stories floated up of quick escapes, friends who were lost, legacies buried in the sand, heroes who brought relief, communities pulling together, grit in the face of exhaustion and uncertainty. The last weeks have been a collective grieving process, made all too acute as we went through boxes of old family photos to find the few intact survivors. What shall we turn our grief into? Will we be reminded

of both the value and the destructive power of our water? Will we learn from the landscapes and infrastructure that held up and adapt? Will we better understand the limits of our designs and appreciate the growing risks? Will we work more with these mighty rivers in our midst or build back the same illusion of control? Will it lead to a culture shift where we grow beyond our independent pioneer story of “if I alone work hard enough,” to embrace the value of “when we work together” communities can overcome forces that crush us individually?

The Great Plains have always been a land of water extremes, so how do we rebuild for a more resilient Nebraska? #NebraskaStrong

~Crystal

Flood resources: [flood.unl.edu](http://flood.unl.edu)

Have ideas for research needs? I'd be glad to help connect you with our faculty.

## Women for Water Gathering Draws 115 Water Experts from Nebraska and Around the World

By Crystal Powers

A new addition to the 2019 Water for Food Global Conference, the Women for Water Gathering brought together 115 participants to explore women's unique contribution to ensuring abundant, clean water for future generations. The May 1st event featured leaders in policy, culture, science and engineering who shared their inspiration, challenges and expertise.

One of the overarching themes that emerged during the event was how women's passion for water is often driven by an intersection of professional expertise and an ethic of caring for families, community, and the world. Talks showcased “women in water leadership providing a network of resources and guidance to inspire future leaders,” said Crystal Powers, the event's organizer.

As one attendee shared, “This event was a ‘watershed’ moment for me in helping define a dialogue and align myself with other women who are working within traditional frameworks to protect our critical resources and enhance community resilience while also developing our own reserves of professional and personal resilience.”

The Women for Water Gathering was an inspiring first step to bringing more women into water leadership, and there are plans to continue this side event in future global conferences.

Learn more at <https://go.unl.edu/womenforwater>.



Executive director of the Groundwater Foundation Jane Griffin (L) discusses strategies for community action and awareness during the Women for Water Gathering on May 1.

ADDRESS SERVICE REQUESTED

# 2019 Nebraska Water Conference:

## Building a Clean Water Future in Northeast Nebraska

► Divots Conference Center: Norfolk, Nebraska

Save the date for this year's conference October 9-10<sup>th</sup> at the Divots Conference Center in Norfolk, NE. Join leaders in water and agriculture to discuss building a clean water future in Northeast Nebraska.

Key topics include:

- Water quality and public health
- Innovative solutions to current problems
- Community engagement

**SAVE THE DATES:**  
Oct. 9 – Oct. 10, 2019  
Expected noon to noon



Credit: Platte Basin Timelapse

more information is available at [watercenter.unl.edu](http://watercenter.unl.edu)

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