

2024 ANNUAL REPORT

One program, endless possibilities.

From the air we breathe to the water we drink, and the places where we live, work, and play, our environment impacts the health and wellness of all people. Clean air, safe water, fertile soil, and a stable climate are essential to our well-being. However, the environmental hazards caused or worsened by our changing climate and environment pose a significant threat to our physical and mental health, disproportionately affecting groups at higher risk.

Our Mission

Established in 2020 through a generous grant from the Claire M. Hubbard Foundation, the Water, Climate and Health Program pioneers interdisciplinary research, education, and collaborative solutions to public health challenges associated with water and climate in Nebraska and around the world.

Our Program

Comprised of an interdisciplinary team uniquely positioned to take on some of the greatest challenges in public health, the Water, Climate and Health Program is a joint effort between the College of Public Health at the University of Nebraska Medical Center, the Daugherty Water for Food Global Institute, and the Institute of Agriculture and Natural Resources at the University of Nebraska- Lincoln.



Our Foundational Commitments



Research

We conduct and disseminate research on public health issues related to water and climate.



Education

We train the next generation of problem solvers to research and address topics focused on health issues associated with water and climate.



Engagement

We work with stakeholders and communities to address public health topics related to water and climate.



Policy

We provide scientific expertise for the development of policy to improve the health of Nebraskans.

Our People

Leadership

Jesse Bell, PhD

Executive Director

Kristina Kintziger, PhD

Associate Director

Eleanor Rogan, PhD

Senior Advisor

Christine Allmon

Program Manager

Yeongjin Gwon, PhD

Director of Biostatistics

Rachel Lookadoo, JD

Director of Public Health Policy



From Left To Right: Yeongjin Gwon, Rachel Lookadoo, Kristina Kintziger, Eleanor Rogan, Jesse Bell and Christine Allmon at the 2024 WCHP Leadership Retreat at the Henry Doorly Zoo

Faculty & Staff

Rachael Birn, MPH

Epidemiologist

Sue Dempsey, MS

Consultant

Babak J. Fard, PhD

Research Assistant Professor

Kelli Gribben, PhD

Postdoctoral Research Associate

Yunju Im, PhD

Assistant Professor

Harshanee Jayasekera, PhD

Postdoctoral Research Associate

Arianna Li, MS

Statistician

Siddhi Munde, MS

Research Data Analyst

Laura Nagengast, MPH

Extension Educator, Source Water Protection

Sarah Elizabeth Scales, PhD

Assistant Professor

Jabeen Taiba, PhD

Postdoctoral Research Associate

Lisa Willard, BA

Program Associate

Summer Woolsey, MPH

Communications and Outreach Coordinator

Students

Abdoulaziz Abdoulaye, MS, MPH

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Kyei Baffor Afari

PhD Student

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Climate Change & Health EMET Student

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PhD Student

Liz Cole

Undergraduate Student Worker

Layhla Currier

Undergraduate Student Worker

Jessenia Hincapie

MPH Student

Hunter Jones, MS

PhD Student

Bryson Lewis

Climate Change & Health EMET Student

Qianting Li

PhD Student

Hillary Mantone

Climate Change & Health EMET Student

Ruth Mencia, MPH

PhD Student

Raheleh Mohammadi, MPH

PhD Student

Bailey Newsome

Climate Change & Health EMET Student

Morgan Penry

Climate Change & Health EMET Student

Denise Torres

Climate Change & Health EMET Student

Catherine Warner, MPH, CP-FS

PhD Student

Advisory Board

Shannon Bartelt-Hunt, PhD

Jesse Bell, PhD

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Don Coulter, MD

Anne Hubbard, MD

Brandon Hunnicutt

Ali S. Khan, MD, MPH, MBA

Alan Kolok, PhD

Peter McCornick, PhD

Eleanor Rogan, PhD

Michael Sousek, MPA

Derry Stover, MPH

Our Interdisciplinary Expertise

Environmental & Climate Science



Climatology, Hydrology, Geosciences, Ecology, Soil Science, Environmental Toxicology, Soil Science, Disaster Risk and Resilience

Epidemiology & Public Health



Environmental & disaster epidemiology, Infectious disease epidemiology, Respiratory & clinical epidemiology, Cancer outcomes, Pediatric & perinatal health, Survey methods & analysis, Public health practice

Biostatistics, Economics, & Analysis



Risk assessment & vulnerability analysis, Biostatistical analysis, Bayesian statistics, Trend analysis, Spatial/temporal analysis, Economics & econometrics, Qualitative research analysis

Public Health Law, Policy, & Emergency Preparedness



Public health law, Medical surge, Isolation & quarantine, Crisis standards of care, Emergency preparedness & response

Data Science & Data Systems



Data science & computer science, Artificial intelligence applications, Machine learning, Large Language Models, Deep learning, Geographic information systems, Remote sensing, Database design & management, Quantitative & Qualitative Research Analysis

Program Management & Operations



Program management, Grants administration & management, Financial management, University & government relations, Human resource management

Communication, Outreach, & Education



Research-to-practice, Stakeholder engagement, Partnership building, Media relations, Environmental education, Graphic design & website development, Video & photography

2024 Program Highlights

1 Improving Disaster Response and Resilience

On Arbor Day 2024, a tornado outbreak destroyed and damaged hundreds of homes throughout Washington and Douglas County. Working with local health departments, our team organized the first-ever Rapid Needs Analysis in Nebraska, deploying over 70 volunteers, including UNMC students, to affected areas to assess and improve response efforts. This effort is the fastest Rapid Needs Analysis conducted in the United States after a tornado.



Volunteers gather to go door to door to survey affected households in Washington County. Douglas County residents received a mailed survey.



Participants of the “Harnessing the Heartland” workshop included public health professionals from across the nation as well as experts on Earth Observations from NASA.

2 Connecting Environmental Health Experts Across the Nation with NASA Earth Data

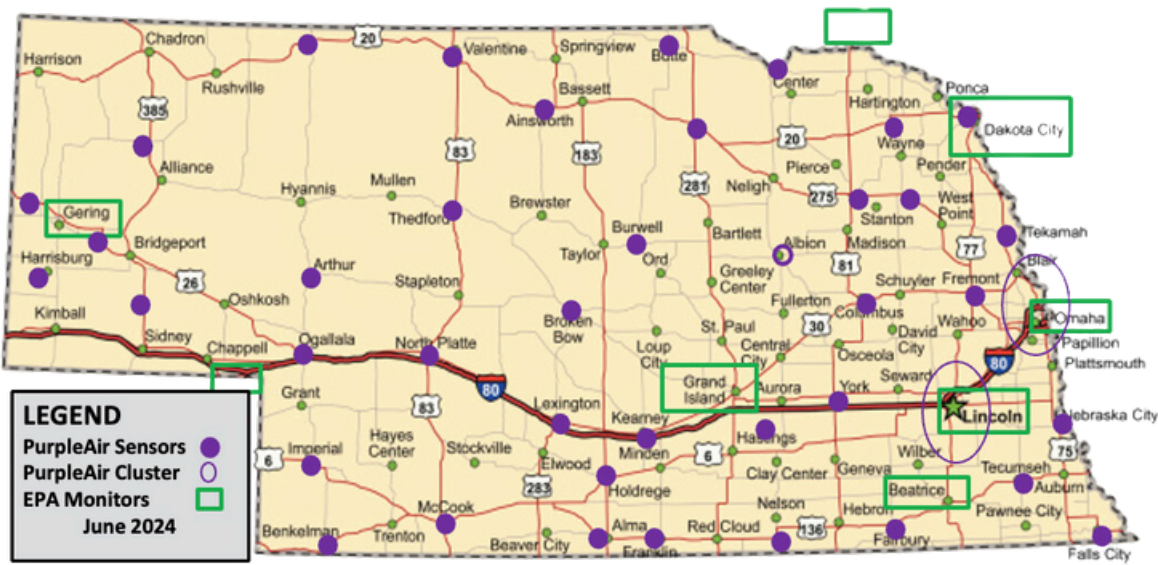
In February and September 2024, the Water, Climate, and Health Program partnered with NASA to train and foster collaborations among public health professionals across the nation. The first jointly-hosted workshop in February focused on using Earth observations for innovative solutions to public health challenges in the region. The second workshop in September emphasized understanding needs and partnership development for improving respiratory health outcomes exacerbated by drought and a rapidly-changing climate.

3 Improving Air Quality Monitoring in Nebraska

Prior to this year, significant gaps in air quality monitoring existed in large swaths of the state, particularly in central Nebraska. To improve air quality monitoring, WCHP’s Nebraska Tracking Program distributed over 30 new PurpleAir sensors to local health departments across Nebraska. Air quality data from these sensors are now available for interventions and education across the state.



Top left: A PurpleAir sensor. Bottom: A PurpleAir sensor is installed in Lexington, NE.



New PurpleAir Monitors Distributed in Nebraska

4 Educating on Water Quality and Health through A Mass Communication Campaign

In collaboration with the UNL Extension Office, in early fall 2024, our program distributed water quality posters and flyers to over 300 organizations across Nebraska, including public health departments, Natural Resource Districts and other public-facing entities. This campaign is a part of the WCHP’s outreach and education efforts on the importance of testing water for common contaminants known to be harmful to human health.



Left: Nitrate and Health Educational Materials distributed across Nebraska. Right: Laura Nagengast, WCHP Source Water Extension Educator & former WCHP graduate assistant, at community outreach events educating on water and health.



Public health professionals from across Nebraska participate in drafting risk communication language on drought and health during an exercise at the Nebraska Environmental Health Summit.

5 Training Public Health Professionals for Drought and Health Preparedness

Responding to critical needs outlined in a nationwide survey of public health professionals published by our staff along with partners at the National Integrated Drought Information System (NIDIS) in 2023, our team has developed training materials to prepare the public health workforce to prepare and respond to the public health threats caused and exacerbated by drought. These tools include preparedness exercises used to train public health professionals in workshops at the state and national level.

Our Impact & Growth

External Funding

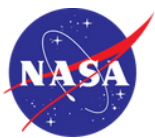
Our faculty have demonstrated remarkable success in securing over \$13 million in external funding since 2022 to advance our mission. These investments support critical initiatives that address pressing issues in public health, climate resilience, and environmental research, reinforcing our leadership in innovative, community-focused solutions. This milestone reflects our faculty's dedication to excellence and the trust placed in their expertise by national and international funding agencies. The Water, Climate and Health Program is also a proud partner of the Cooperative Agreement Earth System Studies, a national consortium of academic and nonprofit institutions sponsored by the National Oceanic and Atmospheric Administration (NOAA). Read more about this initiative at <https://bit.ly/4g8uhqD>.

\$13,760,429

in external funding secured
since 2022

Our external funding sources include:

- NASA
- United States Department of State (USDS)
- Department of Health and Human Services (DHHS)
- United States Military
- National Institutes of Health (NIH)
- National Cancer Institute (NCI)
- Walton Family Foundation
- Centers for Disease Control and Prevention (CDC)
- Children's Mercy Hospital and Clinics
- National Integrated Drought Information System
- Natural Hazards Center
- Wellcome Trust



wellcome trust



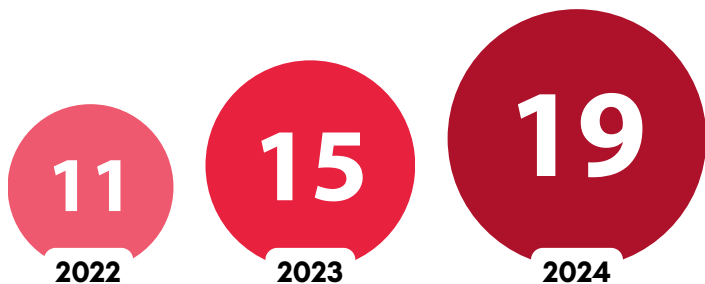
Program Spotlight: Climate Measurements Center of Excellence



The Water, Climate and Health Program is a partner site for the new Climate Measurements Center of Excellence at the University of Vermont, funded by a \$2.7 million grant from the U.S. Department of Commerce. Through this project, our program will help develop measurement standards, address health-related climate impacts, and coordinate working groups to integrate climate data into public health decision-making. By fostering local climate resilience, the center will provide communities with tools and frameworks to prepare for climate risks, with a focus on equity for underrepresented populations.



Our Impact & Growth: By the Numbers



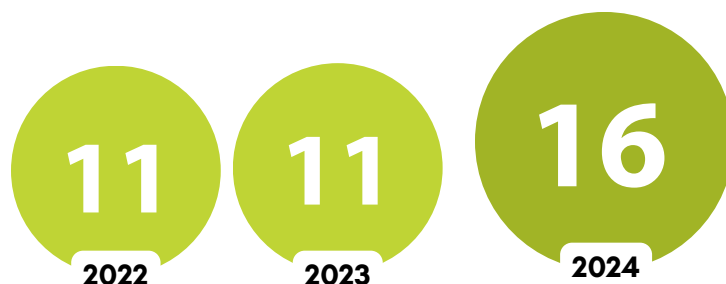
Faculty & Staff



Public health professionals from across the nation brainstorm innovative ideas in drought and health research and engagement at a workshop co-hosted with NASA.

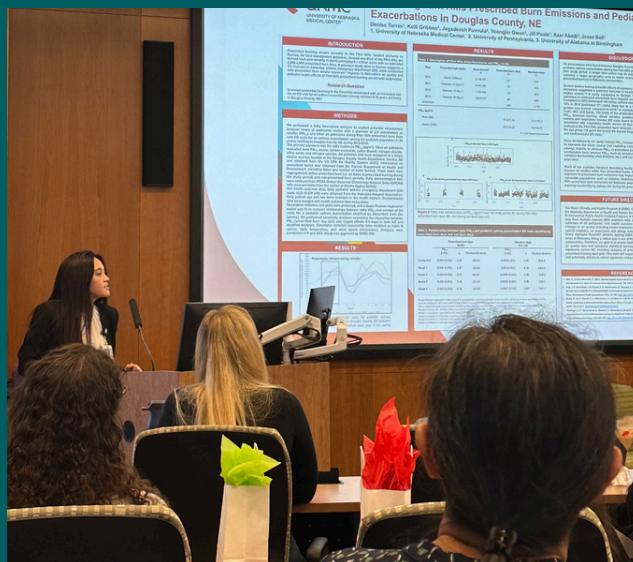


Liz Cole presents her research on disaster preparedness at the Summer Undergraduate Research Program showcase. Liz, an undergraduate student at the University of Nebraska- Omaha, spent the summer doing research with WCHP faculty.



Students: PhD, MPH, Enhanced Medical Education Track, & Summer Undergraduate Research Program

Program Spotlight: Climate Change & Health Enhanced Medical Education Track



EMET student, Denise Torres, presents research

The Climate Change and Health Enhanced Medical Education Track (EMET), launched in 2021 by the Water, Climate, and Health Program in collaboration with UNMC, offers medical students a comprehensive experience in addressing climate-related health challenges. Students engage in research between M1 and M2, presenting their findings at national meetings. They participate in the Healthy Earth Alliance, clinical shadowing, presentations, and events organized by the program. Faculty mentors provide guidance throughout, ensuring a rich and supportive learning experience. The program equips future physicians with the knowledge and skills to tackle the complex intersections of climate change and health in their medical careers.

Our Impact & Growth: By the Numbers

72
2023

114
2024

Presentations

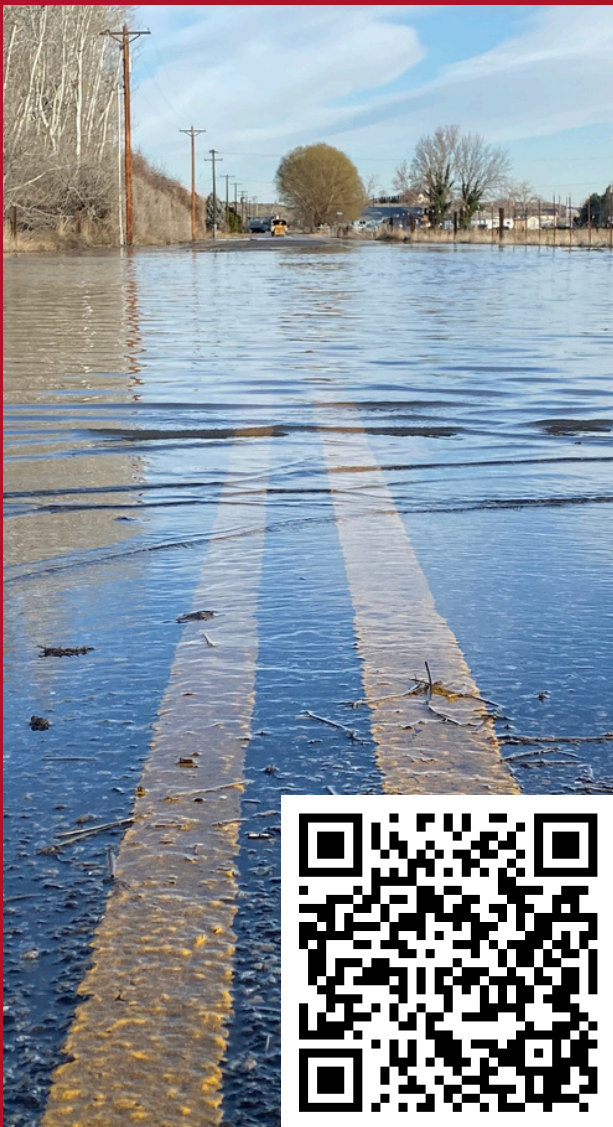
14
2022

20
2023

23
2024

Publications

Featured Publication



Escaping Disaster: Understanding the Drivers and Disparities in Disaster Displacement in the United States

Kristina Kintziger, PhD & Sarah Scales, PhD

Extreme weather events are increasing in frequency and impact, causing rising disaster-related displacement and health risks. In 2023, the U.S. saw 28 disasters costing \$95.1 billion and displacing 2.5 million people. Vulnerable groups, including minorities, LGBTQ+ individuals, and those with lower incomes or disabilities, face greater risks of long-term displacement and adverse conditions. Factors like food and energy insecurity and living in high-risk areas exacerbate displacement. Addressing these disparities requires better data collection and robust public health strategies, emphasizing social determinants of health and culturally tailored interventions to reduce vulnerability and improve disaster preparedness. Read the full article in the American Journal of Public Health at <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2024.307889>.

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2024

Outreach Events & Initiatives

- 2024 Nebraska Youth Climate Summit
- 2024 Indigenous People's Summit
- Citizen Science and Environmental Education Showcase
- Omaha Climate Resiliency Summit
- Urban Heat Resilience Community of Practice
- Emergency Planning Outreach, Washington County Fair
- Ogallala Aquifer Mascot Contest
- Nebraska Climate Action Plan
- NASA Lifelines Humanitarian Simulation
- NIHHIS Heat Tabletop Exercise Contest with Douglas County Health Department
- NCRS Water Quality/Quantity and Source Water Protection Committees
- Omaha Climate Action Plan



Teachers and environmental scientists across Nebraska gathered to collaborate at the Citizen Science and Environmental Education Showcase co-sponsored by the WCHP and the UNL College of Education and Human Sciences



Dr. Kristina Kintziger discusses the disparities of extreme heat health impacts in Omaha in an interview with WOWT

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Media Appearances, Editorials, & Guest Spots



For a full list of our publications, funded projects, news and upcoming events, visit our updated website.

National & Global Reach

Geneva, Switzerland

At the Drought +10 High-Level Meeting in Geneva, WCHP highlighted the health impacts of drought through sessions and recommendations presented by Jesse Bell and Summer Woolsey, emphasizing cross-sector collaboration in drought preparedness, with insights set to influence COP16 negotiations in Saudi Arabia in December 2024.

Helena, Montana

Invited by the CDC Disaster Epidemiology & Response Team following the success of the post-tornado assessment in Nebraska, Kristina Kintziger, Sarah Scales, and Rachael Birn tested alternative rapid needs assessment methods in rural and remote locations in Montana. Their work helped these communities better prepare for future disasters.



Above: Rachael Birn (left) works with CDC staff in Montana to conduct needs assessments for rural and remote communities

Colombo, Sri Lanka

The impacts of drought in South Asia have been severe in the last decade, affecting many sectors, including health. In a meeting hosted by the Asian Disaster Preparedness Center and the UN Convention to Combat Desertification, Jesse Bell was asked to attend to advise on the health impacts of drought and how health considerations can be included in the government of Sri Lanka's national drought management plans.

Program Spotlight: Nebraska Environmental Public Health Tracking

In partnership with the CDC and the Nebraska Department of Health and Human Services, the WCHP is home to the Nebraska Environmental Public Health Tracking Program (Nebraska Tracking). The Nebraska Tracking Program bridges the gap between environmental data and public health by providing accessible, reliable information to inform decision-making. By monitoring factors such as air quality, water quality, and disease patterns, the program helps identify and address environmental health risks across the state. This initiative supports communities, policymakers, and public health professionals in promoting healthier environments and reducing health disparities.



Where in the world is the WCHP?



Right: Dr. Jesse Bell advocates the need to include health as a priority during drought planning at the Drought +10 Meeting on National Drought Policy in Geneva, Switzerland, sponsored by the UN's World Meteorological Organization



Future Directions

The Water, Climate, and Health Program is committed to ensuring the sustainability of our program as we move forward. This focus will guide our efforts to secure long-term impact through innovative research, strong community partnerships, and targeted education initiatives. By addressing critical challenges in water quality, climate resilience, and public health, we aim to build a resilient program that continues to advance health equity and environmental stewardship for years to come. Sustainability is at the heart of our mission, ensuring our work remains impactful and enduring. Core aspects of our path forward include:



Research Impact

Publications in high impact journals

Grant and contract funding

- Center level funding

Builds our national and international reputation

- National and international collaborations



Educational & Academic Impact

Student pipeline for undergraduate, MPH, PhD and MD

Recruits and retains faculty

Develops and expands student internship opportunities

Be a cornerstone of collaboration across NU institutions



Community & Societal Impact

Public engagement

Monitors public impact

Engagement with program alumni

Develops a program that uses funding to benefit Nebraska communities

Stay Connected With the WCHP

Sign up for our Newsletter, Donate to our Program, and Learn More on our Website!



<https://bit.ly/4j99DJD>



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