

Central Plains Drinking Water Quality and Rural Health Symposium

Symposium Report

June 2, 2026

**University of Kansas Conference Center
Lawrence, Kansas**

Prepared by

Scott Ishman

Kansas Geological Survey

With support from organizing committee:

Hannah Horinek – Kansas Geological Survey

Hanna Szydlowski – Kansas Geological Survey

J. Tom Mueller – Kansas Center for Rural Health

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Central Plains Drinking Water Quality and Rural Health Symposium

Outcomes Report

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Executive Summary

Clean, reliable drinking water is essential for healthy communities, economic vitality, and long-term sustainability. Across the Central Plains, however, rural communities continue to face increasing challenges associated with drinking water quality, aging infrastructure, emerging contaminants, funding limitations, and public health impacts. To explore these issues and identify opportunities for collective action, the Central Plains Drinking Water Quality and Rural Health Symposium convened researchers, health professionals, water resource managers, policymakers, extension specialists, nonprofit organizations, and community leaders from Kansas, Nebraska, Iowa, Missouri, and Oklahoma.

The symposium revealed remarkable consistency across states. Participants identified nitrate contamination as the most widespread drinking water quality concern in the region. However, concerns also extend to PFAS, arsenic, uranium, lead, manganese, pesticides, sediment, and other emerging contaminants. These water quality issues are compounded by infrastructure challenges, limited technical capacity, fragmented governance structures, insufficient public awareness, and chronic underinvestment in rural water systems.

Despite these challenges, participants highlighted numerous reasons for optimism. Advances in precision agriculture, GIS, machine learning, citizen science, water treatment technologies, and community-based education programs are creating new opportunities to improve drinking water quality and public health outcomes. The symposium also demonstrated a strong desire for greater interstate collaboration and a shared commitment to building regional solutions.

Four overarching priorities emerged:

1. Strengthen interstate coordination and collaboration.
2. Expand research and data-sharing systems.
3. Increase sustainable investment in infrastructure and monitoring.

4. Build public trust through education, communication, and community engagement.

The symposium served as an important first step toward developing a Central Plains network focused on protecting drinking water and improving rural health.

Why This Symposium Matters

Water quality and public health are inseparably linked. Rural communities depend on safe drinking water not only for household use but also for economic development, agricultural production, healthcare outcomes, and community resilience. Yet many small towns and rural residents face challenges that larger urban systems are better equipped to manage.

Participants repeatedly emphasized that contamination issues, infrastructure needs, health outcomes, public perception, and policy decisions must no longer be addressed independently. Water quality challenges increasingly require multidisciplinary responses that bridge agriculture, environmental science, public health, engineering, education, and policymaking.

Improving water quality and protecting public health will require an integrated approach that combines scientific research, infrastructure investment, effective communication, public education, collaborative governance, and sustainable funding.

The symposium was designed to foster those connections and establish a foundation for future regional collaboration.

Symposium Preface

Jesse Bell, University of Nebraska Medical Center

<https://kgs.ku.edu/sites/kgs/files/2026-06/Preface-Bell.pdf>

Dr. Bell's symposium preface emphasized the growing threat of drinking water contamination in the Central Plains, particularly from nitrates. Drawing on Nebraska's experience, he highlighted the links between agricultural practices, water quality degradation, and human health, while outlining opportunities for research, education, and policy action.

Bell's presentation framed nitrate contamination as a major environmental and public health issue in the Central Plains, particularly for rural populations. He stressed that improving drinking water safety will require greater testing, education, infrastructure investment, research, and cross-sector collaboration.

State Perspectives

Nebraska

Crystal Powers, University of Nebraska-Lincoln

<https://kgs.ku.edu/sites/kgs/files/2026-06/Nebraska-Powers.pdf>

Powers described a mature framework for groundwater management through Natural Resources Districts (NRDs), which combine local governance, education, monitoring, incentives, and regulatory programs. Nitrate contamination remains the state's most widespread groundwater concern, while uranium, manganese, arsenic, selenium, and PFAS continue to receive increased attention.

Highlighted was growing evidence linking drinking water contaminants to adverse health outcomes, including cancers, birth outcomes, and thyroid disease. Nebraska's extensive outreach efforts, community well testing events, educational programs, and citizen science initiatives were identified as successful models for broader regional adoption.

Nebraska Priorities

- Nutrient reduction strategies
 - Studies linking contaminants and health
 - Strong university-health partnerships
 - Well-established public outreach programs
 - Statewide education initiatives
-

Kansas

Cathy Tucker-Vogel, Retired, Kansas Department of Health and Environment

<https://kgs.ku.edu/sites/kgs/files/2026-06/Kansas-Tucker-Vogel.pdf>

Tucker-Vogel's presentation focused heavily on nitrate impacts on public water supply systems. Between 2010 and 2025, more than 58,000 nitrate samples were collected from public water systems statewide. Although many systems remain below regulatory

thresholds, a substantial percentage exhibited nitrate concentrations approaching or exceeding current drinking water standards.

Discussion highlighted the importance of source water protection, proper well construction, producer education, and proactive management strategies. Also highlighted were opportunities created through emerging initiatives such as groundwater quality monitoring programs and statewide assessment activities.

Kansas Priorities

- Source water protection
 - Private well outreach
 - Improved contaminant monitoring
 - Agricultural engagement
 - Enhanced public education
-

Iowa

Martin St. Clair, University of Iowa, Center for Health Effects of Environmental Contamination, IIHR-Hydroscience and Engineering

<https://kgs.ku.edu/sites/kgs/files/2026-06/Iowa-St-Clair.pdf>

St. Clair described the unique pressures created by intensive agricultural production and high nutrient loading across the landscape. Nitrate contamination remains a primary concern for both public water systems and private well users. Also highlighted was increasing attention to pesticides and PFAS contamination.

Emphasized was the importance of connecting environmental monitoring with health outcome data and developing stronger policies that reduce contaminant inputs while maintaining agricultural productivity.

Iowa Priorities

- Nutrient reduction strategies
 - Private well protection
 - Contaminant-health research
 - Enhanced testing infrastructure
 - Public awareness efforts
-

Oklahoma

Jeff Sadler, Oklahoma State University, Oklahoma Water Resources Center

<https://kgs.ku.edu/sites/kgs/files/2026-06/Oklahoma-Sadler.pdf>

Sadler discussed pronounced differences between eastern and western portions of the state. Western Oklahoma faces groundwater supply and nitrate challenges, while eastern regions face phosphate and mining-related issues. Statewide, rural water systems face staffing shortages, aging infrastructure, and increasing regulatory complexity.

Innovative programs such as the Oklahoma Well Owner Network and AI-assisted water treatment tools demonstrate practical approaches for supporting small communities and private well owners.

Oklahoma Priorities

- Small system sustainability
 - Operator workforce development
 - Private well education
 - Infrastructure modernization
 - Technology-assisted management
-

Missouri

Eric Medlock, Missouri Department of Natural Resources & Sam Francus, Missouri Department of Health and Senior Services

<https://kgs.ku.edu/sites/kgs/files/2026-06/Missouri-Medlock%20and%20Francus.pdf>

Medlock and Francus focused on both public water systems and private well health programs. Geological conditions influence groundwater quality throughout the state, contributing to concerns involving nitrate, arsenic, manganese, fluoride, and lead. Participants also discussed ongoing PFAS monitoring and lead reduction programs in schools and drinking water systems.

State health programs demonstrate how public health agencies can support homeowners by providing testing resources, interpretation services, and treatment guidance.

Missouri Priorities

- Lead reduction
- Private well testing

- Public education
 - PFAS monitoring
 - School drinking water safety
-

Key Themes from Breakout Discussions

Across seven discussion tracks, participants identified several recurring challenges.

Water Quality

The contaminants and water quality sessions identified nitrate, PFAS, lead, arsenic, uranium, sediment, and pesticides as major concerns throughout the region. Expensive testing requirements and fragmented monitoring programs contribute to persistent data gaps. Participants also noted growing tensions between regulatory requirements and limited community resources.

Health Impacts

Health-focused discussions emphasized insufficient regional research linking contaminant exposure to health outcomes. Participants called for greater investment in long-term epidemiological studies, improved data sharing, and stronger partnerships between health and water sectors.

Communication

Communication groups identified trust as a central issue. Scientific information often fails to reach communities in practical and understandable ways. Participants stressed the importance of using trusted local messengers, emphasizing solutions rather than fear, and sharing relatable success stories.

Community Engagement

Participants highlighted persistent challenges in engaging private well owners, younger residents, agricultural stakeholders, and underserved populations. Successful engagement efforts often depend on local leadership, extension programs, citizen science initiatives, and education-focused partnerships.

Infrastructure

Aging water infrastructure remains one of the most significant barriers to long-term water security. Many small systems lack sufficient capital for upgrades and struggle to recruit qualified operators. Participants stressed the need for long-term planning, stable funding, and stronger legislative support.

Policy and Funding

Discussions on policy and funding consistently emphasized the need for stable, proactive investment. Participants noted that existing funding structures often reward emergency response rather than prevention and long-term planning. Better coordination among local, state, and federal entities was repeatedly identified as a priority.

Innovations Creating Opportunity

Participants highlighted an impressive range of innovations that could transform drinking water protection efforts across the region.

Technology and Data

- Artificial intelligence tools
- GIS-based decision support systems
- Remote sensing technologies
- Advanced groundwater monitoring networks
- Machine learning approaches for health studies

Agricultural Innovation

- Precision nutrient management
- Improved soil health practices
- Enhanced fertilizer efficiency technologies
- Water reuse systems
- Conservation-focused production approaches

Community-Based Innovation

- [Know Your Well program](#)
- Water Ambassadors initiatives
- Citizen science projects

- Educational gaming and simulation tools
- School-based water education curricula

Success will depend not only on technological innovation but also on building trust, engaging diverse stakeholders, and shifting from reactive problem-solving to proactive, long-term water stewardship.

Regional Action Framework

Goal 1: Build Interstate Collaboration

Establish a structured Central Plains network connecting researchers, agencies, healthcare professionals, extension programs, and water utilities across state lines. Create routine opportunities for peer-to-peer collaboration and information exchange.

Goal 2: Develop Shared Data Infrastructure

Create regional databases and a neutral third-party data platform supporting access to water quality, infrastructure, environmental, and health information. Standardized data systems would improve transparency and accelerate research.

Goal 3: Expand Regional Research

Develop collaborative proposals for large-scale federal funding opportunities aimed at understanding complex relationships between drinking water contaminants and rural health outcomes.

Goal 4: Strengthen Rural Water Systems

Increase investments in infrastructure modernization, workforce development, source water protection, and technical assistance programs that support rural communities.

Goal 5: Increase Public Engagement

Expand communication initiatives that empower communities with practical information, accessible testing resources, and clear pathways for participation in local water quality efforts.

Strategic Recommendations

The symposium generated five priority recommendations:

1. Launch a Central Plains Water and Health Data Hub

Develop a collaborative regional platform supporting access to monitoring data, research findings, mapping tools, and decision-support resources.

2. Establish an Interstate Peer Network

Create structured cross-state partnerships among professionals working in public health, water management, extension, education, and policy.

3. Pursue Regional Research Investments

Advance proposals supporting a Central Plains Regional Water Quality and Health Research Center.

4. Bridge Agriculture and Healthcare

Create formal opportunities for collaboration between agricultural producers, health professionals, researchers, and community organizations.

5. Invest in Public Education

Expand successful programs that increase awareness, improve testing participation, and encourage proactive stewardship of drinking water resources.

Acknowledgments

The Planning Committee gratefully acknowledges all participants, presenters, facilitators, and sponsors whose expertise and engagement made the symposium possible. Their contributions established a strong foundation for future regional collaboration focused on drinking water quality and rural health.

Planning Committee

Scott Ishman	Kansas Geological Survey
J. Tom Mueller	Kansas Center for Rural Health
Hannah Horinek	Kansas Geological Survey
Hanna Szydlowski	Kansas Geological Survey
Matthew Kirk	Kansas State University
Elizabeth Sorensen Montoya	Kansas State University

Crystal Powers
Daniel Snow
Audrey Tran Lam
Katherine Nelson
Caitlin Hodges
Steven Bender

University of Nebraska, Nebraska Water Center
University of Nebraska, Nebraska Water Center
University of Northern Iowa
University of Missouri
University of Oklahoma
National Wildlife Federation (Oklahoma)

Symposium Sponsors

- Kansas State University, Kansas Water Institute
 - University of Kansas Cancer Center
 - University of Kansas, Kansas Center for Rural Health
 - Kansas Geological Survey
 - Kansas Water Office
 - University of Nebraska Medical Center
 - Daugherty Water for Food Global Institute
 - Nebraska Water Center
-

Closing Reflection

The Central Plains Drinking Water Quality and Rural Health Symposium demonstrated that while states face differing circumstances and regulatory frameworks, their underlying challenges are remarkably similar. Participants left with a shared understanding that protecting drinking water and improving rural health will require stronger partnerships, better data, sustainable investment, community trust, and coordinated action across state boundaries. The symposium marked the beginning of a regional effort capable of transforming how the Central Plains addresses water quality and health for future generations.

For more information about the symposium, please refer to the event webpage:
<https://kgs.ku.edu/central-plains-water-and-health-symposium-2026>