

**Nebraska Ground Water Monitoring Council
Spring 2025 Meeting
10 AM – 12 PM, April 22, 2025
NDEE Room 023, Lower Level
245 Fallbrook Blvd.**

- **Introductions**
- **Election of new Council Chair**
- **Ground water related updates, news and announcements from NDEE, NARD, NRDs, UNL, USGS and other agencies**
- **Short Break**
- **Presentations**

**Jason Moudry, Water Programs Specialist, Lower Loup NRD and
Chris Hobza, Lead Hydrologist, U.S.G.S. Nebraska Water Science Center**

"Examining the effect of fertilizer application practices on soil nitrate and water quality"

Summary

Across Nebraska, groundwater resource managers have struggled to identify effective, yet politically durable management actions that can reduce nitrate concentrations in groundwater. Fertilizer application rates that exceed in-season crop demands can result in leaching of nitrate into groundwater. The Lower Loup Natural Resources District (LLNRD) is actively working to improve groundwater quality and reduce the amount of nitrate entering the groundwater system, which in some areas exceeds 10 milligram per liter. The LLNRD and the USGS Central Plains Water Science Center have developed a program of study to support potential water-quality management actions. LLNRD staff worked with willing producers to select 10 different fields for study which used either fall-applied commercial fertilizers, manure or sidedress applications. Repeated soil sampling indicated changes in nitrate and ammonium for the three different fertilization practices over an entire growing season. Potassium bromide was used as an applied tracer to estimate the maximum rate of nitrate movement through well drained loess soils for each field. While data collection and analysis is ongoing preliminary results and lessons from the first year of data collection will be shared.

**Kathleen “Katie” Cameron, Survey Hydrogeologist / ENWRA Coordinator,
CSD-UNL**

“ENWRA Recharge and Focus Areas Assessment Project”

Summary

The Eastern Nebraska Water Resources Assessment (ENWRA) Groundwater Recharge Mapping and Focus Area Assessments Project, one of the Nebraska Water Sustainability Fund (WSF) awards in 2021, is a collaborative effort between the ENWRA sponsors, Conservation and Survey Division, School of Natural Resources, University of Nebraska-Lincoln (UNL-CSD), and the U.S. Geological Survey (USGS). The Project utilized historical water-quality data conjunctively with an improved hydrostratigraphic framework to determine the effectiveness of using Airborne Electromagnetic (AEM) Survey as a tool to assess groundwater vulnerability and recharge potential. Available water-quality, age tracer, and water-level data has been grouped and evaluated using the interpolated AEM soundings to produce High, Moderate, and Low (H, M, L) recharge potential areas within the ENWRA region. The resulting preliminary regional Recharge Potential Map, as well as subsequent refinements and related map products specific to the Focus Areas are available online through an interactive webmap: go.unl.edu/enwra2024map. A U.S. Geological Survey Scientific Investigations Report will accompany the map and discuss the statistical analyses, study results and recommendations for Focus Areas relative to groundwater quantity and quality management concerns crossing ENWRA NRD boundaries. The Recharge Potential map, once published, will be uploaded to the Nebraska GeoCloud, a statewide platform (one of the early WSF funding awards with continued NRD sponsorship) housing Nebraska’s geophysical and supporting geologic products with uniform standards and guidelines.