PROJECT: ENWRA Groundwater Recharge Mapping and Focus Area Assessments #5312 (awarded December 2021)

DATE: JUNE 30, 2025

FINAL REPORT

See Application 5312 and prior Annual Status Reports For Project Scope and Timeline Details (Water Sustainability Fund Status Reports | Natural Resources Commission)

PROJECT PROGRESS APRIL 2025 TO JUNE 30, 2025:

The U. S. Geological Survey (USGS) and University of Nebraska - Lincoln Conservation and Survey Division (UNL CSD) project team continued presentations and final collaborations for the project in spring 2025 including discussions with the ENWRA partners related to next steps and future plans to build off the project results. The UNL CSD team loaded the FINAL Knox Focus Area files (currently PDFs, interactive layers anticipated mid-July) up to the online map portal https://go.unl.edu/enwra2024map:

- Cretaceous Bedrock Elevation Contours
- Water Level Elevation Contours
- Saturated Thickness Contours
- Map Notes Documentation

The online files, CSD cross sections for each area and Map Notes specifically demonstrate the hydrogeological relationships, refinements, and approach difficulties for typical eastern Nebraska settings in the context of recharge potential and sustainability considerations (quality and quantity related). The Project results are also summarized on the updated ENWRA website projects page: https://enwra.org/projects/enwra-recharge. A presentation of the Project was provided to the Nebraska Groundwater Council (Committee) on April 22, 2025 held with multiple attending agencies (https://youtu.be/iW4Smhe7mDk). The agency group had initial dialog regarding potential implications for eastern Nebraska with USGS, CSD, ENWRA and other water related agencies perspectives/expertise present.

ANTICIPATED ACTIVITIES:

This report and associated digital link documentation is considered the FINAL grant close-out report. A pending copy of the USGS publication for the project is available upon request and will be posted on the USGS (https://pubs.usgs.gov/) and ENWRA websites when available, anticipated in 2025. The live interactive CSD portal: https://go.unl.edu/enwra2024map layers will continue to be updated as CSD's routine survey work coincides with the focus areas over time. Additionally, the ESRI Recharge Potential Map Package is posted under the ENWRA grouping on the Nebraska GeoCloud map page along with AEM, borehole and grid data (request login access here: https://snr.unl.edu/csd/geology/AEM.aspx, Jesse Korus , login page link here: https://geocloud.live/Account/Login?ReturnUrl=%2FOverview). The Nebraska GeoCloud is continually being updated with AEM and related datasets (including plans for updating/upgrading borehole data and select borehole attributes evaluated through this project).

ANTICIPATED CASH FLOW FOR REMAINDER OF THE PROJECT:

The fifth and final reimbursement claim, Claim 5 for $23,719.34 (60% of the last of the eligible USGS and UNL CSD costs) was received by ENWRA on June 27, 2025. This final receipt brings the ENWRA 5312 project claim total to $143,939.33 out the original $144,000 award. ENWRA hereby releases the remaining unclaimed $60.67 back to the WSF in order to close-out the award.

LIKELIHOOD THAT BENEFITS PROJECTED IN APPLICATION 5312 WILL BE REALIZED:

Based on previous project results provided by USGS and UNL CSD and summarized herein, the project achieved the benefits as described in the application. The High Moderate Low Recharge Potential Map (top 50 feet of AEM data and associated deliverables and evaluations) will assist eastern Nebraska NRDs with the following:

- identification of potential high recharge areas and vulnerability evaluations for those readily recharged areas,
- identification of potential low recharge, more protected aquifer areas;

- updates and/or refinements to areas of hydrologically connected groundwater and surface water;
- positioning new geologic test holes, network monitoring locations and/or screen to enhance the NRD monitoring networks, assessment/reporting activities and their effectiveness.
- targeting additional geophysical data gathering (airborne and/or ground-based)
- evaluation of drought or flood actions;
- potential re-evaluation of management area boundaries/rules;
- groundwater modeling projects in progress/planned

The focus area understandings, regional mapping results and deliveries experienced with the project will be used as a roadmap for the next stages of eastern Nebraska hydrogeologic assessment. The project provided a plan and process for future assessment (ex: County and community area scale evaluations), understanding preferential recharge areas and controls, mapping out areas where little to no recharge is occurring, and the complexities of lateral versus vertical recharge where future work is needed. Additionally, the project results fulfil the Department of Natural Resources interest to further understand the effectiveness of airborne geophysical studies in assessing hydrologic connection of aquifers and streams through groundwater modeling tools and the value in collaborations. Board members, the public, NRD staff, ENWRA and other advisory agencies will be able to view and further analyze the project data for other projects and evaluations, likely for local purposes beyond those originally envisioned. This project also advanced the Nebraska GeoCloud, CSD, ENWRA and USGS work methods and presentation footprints through the interagency collaborations. Example: converting/standardizing data with ever changing software products and levels of accessibility for upload and sharing so various levels of constituents can benefit from the results. This project helps the project partners better understand the nature, occurrence, and availability of ground water supplies in eastern Nebraska and appropriately plan for many years to come.