OUR MISSION
The Conservation and Survey Division (Nebraska Geological Survey), the natural resource survey component of the School of Natural Resources, is a unique, multi-disciplinary research, service and data-collection organization established by state statute in 1921. The Division's mission is to investigate and record information about Nebraska's geologic history, its rock and mineral resources, the quantity and quality of its water resources, land cover and other aspects of its geography, as well as the nature, distribution and uses of its soils.

WHO ARE WE?
We are a dedicated group of geologists and other Earth scientists who constantly build upon an in-state, national, and international reputation for scientific and service excellence extending back more than 120 years.

WHAT DO WE DO?
We engage in data collection and research dealing with the geology, soils, and physical environment of Nebraska and the enclosing region. Our work includes research, extension, outreach, and teaching.

WHY ARE WE NECESSARY?
We are Nebraska’s designated geological survey and we provide essential, unbiased scientific expertise, not readily supplied from other organizations, which supports the many needs of diverse stakeholders and the citizens of Nebraska. The Conservation and Survey Division is mandated by law in Nebraska Revised Statutes 85-163 and 85-164.
Conservation and Survey Division
Annual Report 2018

Total extension contacts by CSD personnel in 2018: 4,519

Total requests for data and analysis served by CSD personnel in 2018: 565

Total continuing education units for professionals (CEUs) generated by CSD personnel in 2018: 3,396

Total footage of test holes drilled and/or logged by CSD personnel in 2018: 10,487 ft

Total automated groundwater-data entries overseen by CSD personnel in 2018: 382,122

Total groundwater quality results processed by CSD personnel in 2018: 19,214

Total individual measurements of groundwater levels made by CSD personnel in 2018: 7,901

Total number of groundwater-monitoring wells replaced by CSD personnel in 2018: 5

Total number of monitoring wells serviced by CSD personnel in 2018: 33

Total media interviews by CSD personnel in 2018: 23

Total teaching load of CSD personnel in 2018: CSD faculty taught 10 courses with a combined enrollment of 103 students
Publications authored or coauthored by CSD personnel in 2018:


Korus, J.T., 2018, Combining hydraulic head analysis with airborne electromagnetics to detect and map impermeable aquifer boundaries, Water, v. 10, no. 8, p. 975. doi: 10.3390/w10080975


Korus, J.T., and Joeckel, R.M., 2018, Airborne geophysical resolves stratigraphic and hydrogeologic complexity at the eastern boundary of the Great Plains in Nebraska;


Presentations by CSD personnel and their students in 2018:

2018 ENWRA Spring Technical Meeting Presentation. Six Nebraska NRDs and USGS, CSD, and DNR partner agencies, May 3, 2018 (Cameron).

3D Architecture of Miocene Boulder Conglomerates Using Unmanned Aircraft, Photogrammetry, and GPR. 20th International Sedimentological Congress, Quebec, Canada (Korus and Joeckel).

3D Site Characterization Using Unmanned-Aircraft Photogrammetry and Ground Penetrating Radar (GPR): Examples from the Arikaree Group in Western Nebraska. Association for Materials and Methods in Paleontology, 11th Annual Meeting, Lincoln, Nebraska (Korus)

AEM Presentations to Lower Platte North NRD and Producers. January 30, March 13, March 22 (Cameron).


Airborne Geophysics Resolves Stratigraphic and Hydrogeologic Complexity at the Eastern Boundary of the Great Plains in Nebraska. North-Central Section, Geological Society of America, Ames, Iowa, April 17, 2018 (Korus and Joeckel).


Catalysts of Change: An evaluation of the Nebraska Water Leaders Academy. ISSRM, June 20, 2018 (Burbach).


Controls on patterns of upper Colorado River bedrock incision. Joint 70th Annual Rocky Mountain Geological Society of America Section/114th Annual Cordilleran Geological Society of America Section Meeting, Flagstaff, Arizona, May 16, 2018 (Hanson, with others).

Decadal changes in groundwater recharge and nitrate concentrations in a shallow aquifer under changing agricultural practices: application of repeat sampling and machine learning approaches. American Geophysical Union Fall Meeting, December 13, 2018 (Gilmore, with others).

Demonstration of Nebraska GeoCloud and Related Software Tools for Groundwater Practitioners. NRD Water Programs Conference, Kearney, NE. March 6, 2018 (Korus).

Discovery of Zircons in the Ashfall Fossil Beds and Grove Lake Volcanic Deposits of Northeastern Nebraska: U-Pb Ages and Successful Sampling Strategies. North-Central Section, Geological Society of America, Ames, Iowa, April 17, 2018 (Joeckel, with others).

Dune Formation South of the Niobrara River Valley, North-Central Nebraska Sand Hills. North-Central Section, Geological Society of America, Ames, Iowa, April 17, 2018 (Hanson, with others).


ENWRA Update to Lower Elkhorn NRD. February 22, 2018 (Cameron).

ENWRA Update to Lower Platte North NRD. January 8, 2018 (Cameron).

ENWRA Update to Nemaha NRD. February 8, 2018 (Cameron).
ENWRA Update and AEM Presentation. Lower Platte South NRD Board & Water Subcommittee, April 4 and 12, 2018 (Cameron).

Full Range Leadership for Leaders in the Water Arena. Nebraska State Irrigation Association Water Leaders Academy, January 25, 2018 (Burbach).

Haskell Agricultural Laboratory CSD Drilling and Logging Presentation. Aug 14, 2018 (Cameron, Lackey, Marxsen, Seaman).


Improving of Student Accuracy at Determining Soil Texture by Feel. Earth Educators Rendezvous. University of Kansas, Lawrence, Kansas, 16-20 Jul. 2018 (Turk).

Integrating AEM and Borehole Data for Regional Hydrogeologic Synthesis: Tools and Examples from Nebraska, USA. 7th International Workshop on Airborne Electromagnetics, Kolding, Denmark (Korus, Cameron, and others).

Investigation of a Paleolake Environment in the Late Miocene, Nebraska. American Geophysical Union Fall Meeting, December 10, 2018 (Joeckel, with others).

Maximizing Your Civic Capacity by Engaging in Water Issues. Nebraska Association of County Officials (NACO), Institute of Excellence, February 13, 2018 (Burbach).


Nebraska GeoCloud and AEM data integration. Nebraska Water Industries Convention, Kearney, NW. February 13, 2018 (Korus).

Online Data Available from the CSD. Nebraska Association of County Officials (NACO), Institute of Excellence, February 13, 2018 (Burbach).


Rainfall and Formation of Vesicular Pores. Weatherfest. University of Nebraska, Lincoln, April 7, 2018 (Yvette Rosas, Environmentors student of Turk).

Range Soils. Nebraska Range Short Course. Chadron State College, Chadron, NE, June 18, 2018 (Turk).

Rosebud Formation in Niobrara Valley, Nebraska, USA: Silt-Dominated Alluvial to Eolian Deposition on the Oligocene Great Plains. 20th International Sedimentological Congress, Quebec, Canada (Joeckel).

Scientific Investigations on Cretaceous (Albian-Turonian) Strata from the Rose Creek Escarpment (RCE) along the Nebraska-Kansas Border, Cratonic Margin of the Western Interior Basin. North-Central Section, Geological Society of America, Ames, Iowa, April 17, 2018 (Joeckel, with others).

Secondary Aquifers in Nebraska and Surrounding States. Shallow Exploration Drillers Clinic, La Vista, NE, April 18, 2018 (Divine).

Securing Water for and from Agriculture through Effective Community & Stakeholder Engagement. Nebraska Association of Resources Districts, Legislative Conference, January 24, 2018 (Burbach).

Securing Water for and from Agriculture Through Effective Community & Stakeholder Engagement. Nebraska Water Center, Spring Retreat, April 5, 2018 (Burbach).

Soils Training and Field Workshops for Nebraska Onsite Waste Water Association. North Platte, October 30, 2018 (28 participants), and Lincoln, November 1, 2018 (Turk).


Sustainability of Groundwater Resources: Myths and Realities of Water Balance. Nebraska Water Leaders Academy. Lincoln, NE. January 26 (Korus).

The Geology and Characteristics of Nebraska’s Aquifers. Water Topics for Teachers Conference, American Groundwater Trust, Nebraska City, NE (Young).

The Geology of Nebraska in Context. Shallow Drillers Exploration Clinic, La Vista, NE, April 18, 2018 (Joeckel).

The Unified Soil Classification System, Comparisons, and Related Aspects. Shallow Drillers Exploration Clinic, La Vista, NE, April 18, 2018 (Joeckel).


Using High Resolution LiDAR-Derived DEM’s to Interpret Early Holocene Dunes and Their Reactivation Around 4000 yrs ago in Northwest Wisconsin. North-Central Section, Geological Society of America, Ames, Iowa, April 17, 2018 (Hanson, with others).


What is Beneath the Sand? Sandhills Discovery Conference, Ainsworth, Nebraska (Lackey).


Awards attained by CSD personnel and students in 2018:

ASABE Blue Ribbon Award in Educational Aids Competition for Pilot Watershed Science Curriculum for Natural Resources Districts (2018 ASABE Annual International Meeting in Detroit, MI - July 2018) to T. Gilmore and others.

Editors’ Choice on EOS website (eos.org); “Evapotranspiration trends (1979–2015) in the Central Valley of California, USA” Water Resources Research, 54 (doi.org/10.1029/2018WR022704) to J. Szilagyi

Editors’ Pick in journal Sedimentology showcasing “good practice, innovative approaches, and noteworthy advances in our science” for article ”3-D architecture and hydrostratigraphy of cross-cutting buried valleys using airborne electromagnetics, glaciated Central Lowlands, Nebraska, U.S.A.” to J. Korus, R.M. Joeckel, and D. Divine

UNL Soil Judging Team 1st place overall, 3rd place group, 1st, 3rd, and 5th place individuals. Region 5 Soil Judging Contest, Manhattan, KS. 17-21 Sept. 2018 to J. Turk.

Margaret Hawn Mirabile Memorial Best Student Paper Award at the 2019 Eastern Section AAPG meeting was awarded to a paper on which R. M. Joeckel and D. Divine were coauthors.

Organizations for which CSD personnel fulfilled requests for information, consultation, or services in 2018:

Adaptive Resources, Inc.
Alfs Well Drilling
American Association of Petroleum Geologists
APEC Climate Center, South Korea
Bazile GWMA group
Benesch
Black and Veatch Consulting
Bucknell University
Budapest University of Technology
CH2M Hill Consulting
Central Platte NRD
Chinese Academy of Sciences
Citizens opposed to proposed Lancaster County chicken farms
City of Hastings, Nebraska
City of Omaha, Nebraska
City of Waverly, Nebraska
Daugherty Water for Food Institute
Delta Plastics
Desert Research Institute
Downey Drilling
Dr. Mary Anne Holmes
Duck Creek Ranch
EA Engineering
HDR Consulting
Husker Ag LLC
Jefferson County, Nebraska
JEO Consulting
Journal of Hydrology
K2 Geothermal
Kerford Limestone Company
KLKN TV
KODY Radio
KOLN TV
KRVN Radio
Lewis and Clark NRD
Little Blue NRD
Lower Big Blue NRD
Lower Elkhorn NRD
Lower Loup NRD
Lower Platte North NRD
Lower Platte South NRD
Middle Republican NRD
Missouri State University
National Groundwater Monitoring Network
National Park Service
Natural Resources Conservation Service
Nebraska Association of Natural Resource Districts
Nebraska Department of Education
Nebraska Department of Environmental Quality
Nebraska Department of Health and Human Services
Nebraska Department of Natural Resources
Nebraska Environmental Trust
Nebraska Game and Parks Commission
Nebraska Oil and Gas Conservation Commission
Nebraska Public Power
Nebraska State Irrigation Association
Nebraska Water Leaders Academy
Nebraska Well Drillers Association
Nemaha NRD
NET Radio
North Platte area homeschoolers
NTV News
Papio-Missouri River NRD
Pennsylvania State University
Roy Lyles (rancher and NRD candidate)
RTA Petroleum
Santee Sioux Nation
Skylar Loeffler (rancher and NRD candidate)
South Platte NRD
Spear “T” Ranch
Twin Platte NRD
United States Department of Agriculture
United States Forest Service
United States Geological Survey, Nebraska Water Science Center
University of Nebraska-Lincoln faculty and students
University of Nebraska State Museum
University of Nevada-Reno
University of Wisconsin
Upper Elkhorn NRD
Upper Loup NRD
Upper Republican NRD
U.S. Geological Survey
Utah State University
Utah Water Research Laboratory
Village of Springfield, Nebraska
Village of Stuart, Nebraska
Webster Well Drilling

Selected Objectives for CSD in 2019:

- Develop the “Nebraska GeoModeling Workshop,” educating groundwater professionals on the use of geological models in water management.
- Complete multiple geologic maps (STATEMAP, Missouri National Recreational River).
- Completion of Nebraska CarbonSafe Phase II
- Completion of 2018 groundwater-levels report
- Omaha Combined Sewer Outflow tunnel subsurface geology assessment.
- Continue research on geology of Nebraska Panhandle, Niobrara River Valley, Sand Hills, and statewide hydrogeology.
- Continue extensive test-hole drilling and data analysis for Eastern Nebraska Water Resources Assessment (ENWRA).
- Improve and maintain CSD core- and sample-storage facilities at Mead.