

ANNUAL REPORT 2019

Conservation and Survey Division
School of Natural Resources
University of Nebraska–Lincoln

127 YRS
CSD
1893-2020



CONSERVATION AND
SURVEY DIVISION

School of Natural Resources

Photo: Describing cores and correlating
strata for Omaha CSO deep tunnel project

Conservation and Survey Division

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.

Conservation and Survey Division

Annual Report 2019

February 2020

R.M. Joeckel

Director, Conservation and Survey Division
Senior Associate Director, School of Natural Resources

University of Nebraska–Lincoln

CSD 2019 Accomplishments at a Glance

Extension contacts by CSD personnel in 2019: 3,082

Requests for data and analysis served by CSD personnel in 2019: 660

Footage of test holes drilled and/or logged by CSD personnel in 2019: 16,058 ft

Automated groundwater-data entries overseen by CSD personnel in 2019: 489,216

Groundwater quality results processed by CSD personnel in 2019: 6,977

Teaching contribution of CSD personnel in 2019: CSD faculty taught ten (10) different courses in four (4) different programs, producing 831 student credit hours

Students advised by CSD personnel in 2019: 21 graduate students and 3 undergraduate research students, including 2 UCARE students

Continuing education units for professionals (CEUs) generated by CSD personnel in 2019: 525

Total grant funding with which CSD personnel were associated: \$3.35 million

Total scientific publications of all kinds authored or coauthored by CSD personnel: 44

Peer-reviewed scientific journal articles: 18

Comments on scientific journal articles: 3

Survey reports, bulletins, and field guides: 4

Geologic maps: 2

Major field trips run or co-run by CSD personnel in 2019: 2

Presentations by CSD personnel in 2019: 45

Media interviews by CSD personnel in 2019: 4

Social media involving CSD in 2019: 108 tweets and 91,000 impressions

Total page views of CSD website in 2019: 86,298 page views from 67 countries

Publications Authored or Coauthored by CSD Personnel in 2019

- Aslan, A., Karlstrom, K., Kirby, E., Heizler, M., Granger, D., Feathers, J., **Hanson, P.R.**, Mahan, S., 2019. Resolving time-space histories of Cenozoic bedrock incision along the Upper Colorado River, USA. *Geomorphology* 347, article no. 106855.
- Baldauf, P.E., Burkhart, P., **Hanson, P.R.**, Larsen, A.K., 2019. Chronology of White River Badlands eolian sedimentation, northern Great Plains, South Dakota. *Aeolian Research* 37, 14-24.
- Burbach, M.E.**, Floress, K., and Prokopy, L., 2019. Catalyzing change: Social science for water resource management. *Journal of Contemporary Water Research & Education* 167, 1-5.
- Burbach, M.E.**, and Reimers-Hild, C., 2019. Developing water leaders as catalysts for change: The Nebraska Water Leaders Academy. *Journal of Contemporary Water Research & Education* 167, 6-22.
- Cameron, K.**, and **Olafsen Lackey, S.**, 2019. Hydrogeologic framework of eastern Nebraska—recent deeper (Early Cretaceous to Cenomanian) exploration. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-327000
- Czap, N.V., Czap, H.J., Banerjee, S., and **Burbach, M.E.**, 2019. Encouraging farmers' participation in the Conservation Stewardship Program: A field experiment. *Ecological Economics* 161, 130-143.
- Divine, D.P.**, Cherry, M., **Gilmore, T.**, Orvis, K., Little, N., Thorburn, J., and Onnen, M., 2019. Characterizing aquifer properties in the vicinity of a groundwater mound in the High Plains aquifer, south-central Nebraska. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-326319
- Feitl, M., Kern, A.K., Jones, A., Fritz, S.C., Baker, P.A., **Joeckel, R.M.**, Salenbien, W., and Willard, D., 2019. Paleoclimate of the subtropical Andes during the latest Miocene, Lauca Basin, Chile. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 534, article no. 109336
- Gilmore, T.E.**, Johnson, M., **Korus, J.T.**, Mittelstet, A., Briggs, M.A., and Zlotnik, V., 2019. Streambed flux measurement informed by distributed temperature sensing leads to a significantly different characterization of groundwater discharge. *Water* 11, 2312, <https://doi.org/10.3390/w11112312>
- Hallum, D.R.**, 2019. Observations of stream-groundwater interaction at parcel, ranch, and reach scale, west-central Nebraska. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-326093
- Haigh, T.R., Otkin, J.A., Mucia, A., Hayes, M., & **Burbach, M.E.**, 2019. Drought early warning and the timing of range managers' drought response. *Advances in Meteorology*, Article 9461513
- Haigh, T., Schacht, W., Knutson, C.L., Smart, A.J., Volesky, J., Allen, C., Hayes, M., and **Burbach, M.**, 2019. Socioecological determinants of drought impacts and coping strategies for ranching operations in the Great Plains. *Rangeland Ecology & Management* 72: 561-571.
- Hallum, D.R.**, 2019. Informing water use decision-making for waterfowl and agricultural production on a ranch along the North Platte River, Nebraska. *Conservation and Survey Division, Open File Report* 205, 276 p.
- Hallum, D.**, Terry D., Leite, M., **Sibray, S.**, Balmat, J. 2019. Exploring the Northwest Margin of the High Plains Aquifer: Structure, Depositional History and Hydrogeology. Nebraska Geological Society Field Trip. *Conservation and Survey Division Guidebook* 35. Lincoln, NE: University of Nebraska, Conservation and Survey Division. 43 p.
- Hanson, P.R.**, and **Howard, L.M.**, 2019. Surficial geology of the Monroe 7.5 Minute Quadrangle, Nebraska. USGS STATEMAP

Cooperative Geologic Mapping Program
[<https://snr.unl.edu/data/geologysoils/STATEMAP/index.aspx>].

Ivester, A.H., **Hanson, P.R.**, O'Brien, S.T., Elliott, D.T., Jennings, T.A., 2019. Luminescence dating and archaeological site formation processes, Sand Hills of western Georgia, USA. *Book of Abstracts, UK Luminescence and ESR Dating Meeting* (Roskilde, Denmark August 26-28th).

Joeckel, R.M., 2019. First report of widespread polygonal ground in Nebraska and its association with eolian landforms. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-326243

Joeckel, R.M., 2019. Omaha underground: Revised stratigraphy and significance of Upper Pennsylvanian strata below Nebraska's largest city. *Geological Society of America Abstracts with Programs* 51(5), doi: 10.1130/abs/2019AM-338598.

Joeckel, R.M., Divine, D., Howard, L., Cameron, K., and Waszgis, M. 2019. Geology of Southeastern Nebraska. Conservation and Survey Division, Nebraska Well Drillers Association and Nebraska Geological Survey. *Conservation and Survey Division Guidebook* 36. Lincoln, NE, University of Nebraska, 62 p.

Joeckel, R.M., Hanson, P.R., and Howard, L.M., 2019. Solving a periglacial puzzle: Pleistocene polygonal ground in North-Central Nebraska. *Great Plains Research*, v. 29 (2): 153-168.

Johnson, W.C., Halfen, A.F., Spencer, J.Q.G., **Hanson, P.R., Young, A.R.**, Mason, J.A., 2019. Late MIS 3 Stabilization of dunes in northeastern Kansas, USA. *Aeolian Research* 36, 68-81.

Korus, J.T., Joeckel, R.M., and Tucker, S.T., 2019. Giant, bouldery fluvial bars in an exhumed Miocene paleovalley, Nebraska Panhandle. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-326196

Korus, J.T. and Howard, L.M., Maps showing the Physical Hydrogeology and Changes in Saturated Thickness (Predevelopment to Spring 2016 and Spring 2011 to Spring 2016) in the Middle Republican Natural Resources District, Southwestern Nebraska. University of Nebraska-Lincoln, Conservation and Survey Division, 30 p.

Ludvigson, G.A., Layzell, A.L., **Joeckel, R.**, Möller, A., and Mandel, R., 2019. Record of the Middle Cenomanian Event from the Cretaceous Western Interior Seaway (WIS) in Kansas. *2019 AAPG Mid-Continent Section Meeting Oral Presentation Abstracts* (Wichita Kansas) [<http://aapgmcs.org/images/2019sm/OralAbstracts.pdf>].

Ludvigson, G.A., **Joeckel, R.M.**, Layzell, A.L., Möller, A., and Mandel, R., 2019. Expression of Middle Cenomanian Event along the cratonic margin of the Cretaceous Western Interior Seaway (WIS). *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-326757

Ma, N., and **Szilagyi, J.**, 2019. The CR of evaporation: a calibration-free diagnostic and benchmarking tool for large-scale terrestrial evapotranspiration modeling. *Water Resources Research* 55 (8): 7246-7274, doi:10.1029/2019WR024867

Ma, N., **Szilagyi, J.**, Zhang, Y., Liu, W., 2019. Complementary-relationship-based modeling of terrestrial evapotranspiration across China. *Journal of Geophysical Research: Atmospheres* 124, doi: 10.1029/2018JD029850.

Mahoney, G., **Hanson, P.R.**, Bringelson, D., 2019. Understanding archaeology in the dunes: OSL dating of the Tolleston Beach at Indiana Dunes National Lakeshore and its implications for interpreting the archaeological record. *84th Annual Society for American Archaeology Meeting*, p. 504.

Miao, X., **Hanson, P.R.**, Stohr, C., and Wang, H., 2019. Evidence supporting Holocene loess in Illinois with new proxy data and historical, regional perspectives on loess deposition in the

- upper Mississippi River Valley. *Quaternary Science Reviews* 216: 119-123.
- Möller A., Ludvigson G.A., Smith J.J., **Joeckel R.M.**, McLean N.M., Hallman J.A., Sitek B.C., and Turner E., 2019. Is DZ Driving You(r) MAD? Volcanogenic Zircon in Mature Paleosols Better Determine the Maximum Age of Deposition [Abstract]. *Goldschmidt Abstracts 2019*, 2314 (Annual Conference of European Association of Geochemistry and the Geochemical Society [https://goldschmidt.info/2019/abstracts/abstractView?id=2019005473]).
- Möller, A., Smith, J.J., Ludvigson, G.A., McLean, N.M., **Joeckel, R.M.**, Hallman, J.A., Graham, M., Sitek, B.C. and Turner, E., 2019. Improving chronostratigraphy of continental deposits with integrated geochronology and geochemistry: Case studies in the mid-continent US High Plains. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-327631
- Robertson, C.H., Ludvigson, G.A., **Joeckel, R.M.**, Kirkland, J.I., and Davis, J., 2019. Stable isotope paleohydrology of the Lower Cretaceous (Aptian) Poison Strip Sandstone Member of the Cedar Mountain Formation, eastern Utah. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-326661
- Smith, J.J., Field, H.L., **Joeckel, R.M.**, Möller, A., Tucker, S.T., and Layzell, A.L., 2019. New approach to U-Pb zircon and carbon isotope geochemistry of paleosols in the upper Miocene Ogallala Group, north-central Nebraska, USA. *Geological Society of America Abstracts with Programs* 51 (2), doi: 10.1130/abs/2019SC-327630
- Smith, V., and **Joeckel, R.M.**, 2019. Carbon storage and the characterization of the Lansing-Kansas City Group through cores and logs. *2019 AAPG Mid-Continent Section Meeting Oral Presentation Abstracts* (Wichita Kansas) [http://aapgmc.org/images/2019sm/OralAbstracts.pdf].
- Smith, V., **Joeckel, R.M.**, and Main, J., 2019. Lansing-Kansas City correlations from outcrop belt to Red Willow County, Nebraska. *2019 AAPG Mid-Continent Section Meeting Poster Presentation Abstracts* (Wichita Kansas) [http://aapgmc.org/images/2019sm/PosterAbstracts.pdf].
- Sweeney, M.R., McDonald, E.V., Chabela, L.P., **Hanson, P.R.**, 2019. The role of eolian-fluvial interactions and dune dams in alluvial fan and ephemeral wash dynamics, late Pleistocene-Holocene, Mojave Desert, USA. *Geological Society of America Abstracts with Programs* 51 (5), DOI: 10.1130/abs/2019AM-337211
- Szilagyi, J.**, 2019. Comment on “A hybrid approach combining the FAO-56 method and the complementary principle for predicting daily evapotranspiration on a rainfed crop field” by Kim et al., *Journal of Hydrology* 578,doi:10.1016/j.jhydrol.2019.124031
- Szilagyi, J.**, Crago, R., 2019. Comment on “Derivation of a sigmoid generalized complementary function for evaporation with physical constraints” by S. Han and F. Tian, *Water Resources Research* 55, doi: 10.1029/2018WR023502.
- Szilagyi, J.**, Jozsa, J., Nagy, E.D., Kramer, T., and Spitzerne, M.F., 2019. Catchment size is an important factor in mapping long-term flood behavior, comment on Blöschl, G. et al. “Changing climate both increases and decreases European river floods” in *Nature*, 573, 108-111, (2019); https://doi.org/10.1038/s41586-019-1495-6.
- Tracy, J., Johnson, J., Konikow, L., Miller, G., Osborne Porter, D., Sheng, Z., and **Sibray, S.**, 2019. *Aquifer depletion and potential impacts on long-term irrigated agricultural productivity*. Council for Agricultural Science and Technology (CAST) Issue Paper 63.
- Turk, J.K.**, and Young, R.A. 2019. Field Conditions and the Accuracy of Visually-determined Munsell Soil Color. *Soil Science Society of America Journal* doi: 10.2136/sssaj2019.06.0196

Young, A.R., Burbach, M.E., Howard, L.M., Waszgis, M.M., Lackey, S.O., and Joeckel, R.M., 2019. Nebraska statewide groundwater-level monitoring report – 2018. School of Natural Resources, University of Nebraska-Lincoln, Water Survey Paper 86.

Young, A.R., Waszgis, M.M., and Howard, L.M., 2019. Surficial geology of the Crete South 7.5 Minute Quadrangle. USGS

STATEMAP Cooperative Geologic Mapping Program [<https://snr.unl.edu/data/geologysoils/STATEMAP/index.aspx>].

Zagyvai-Kiss, K., Kalicz, P., **Szilagyi, J.,** Gribovszki, Z., 2019. On the specific water holding capacity of litter for three forest ecosystems in the eastern foothills of the Alps. *Agricultural and Forest Meteorology* 278, doi:10.1016/j.agrformet.2019.107656.

Presentations by CSD Personnel and their Students in 2019

A Conceptual Model for Assessing Whether and How Community-Led Engagement Builds Community Capacity to Address Complex Environmental Challenges in Agricultural Landscapes. International Symposium on Society and Resource Management, Oshkosh, WI, June 4, 2019 (**Burbach, M.E.**).

An Alternative Method for Teaching Field Determination of Soil Texture. Soil Science Society of America International Soils Meeting, San Diego, CA, January 6-9, 2019 (**Turk, J.K.**).

Aquifers of Nebraska and Surrounding States. Countryside Community Church, Omaha, NE, October 9, 2019 (**Divine, D.P.**).

Boundary Spanners and Trust Development between Stakeholders in Integrated Water Resource Management. American Water Resources Association, 2019 Specialty Conference, Omaha, NE, March 27, 2019 (**Burbach, M.E.**).

Boundary Spanners: A key Resource in Developing Trust between Stakeholders in Integrated Water Resource Management. International Symposium on Society and Resource Management, Oshkosh, WI, June 4, 2019 (**Burbach, M.E.**).

Characterizing Aquifer Properties in the Vicinity of a Groundwater Mound in the High Plains Aquifer, South-Central Nebraska. Joint Meeting of North-Central, South-Central, and Rocky Mountain Sections, Geological Society of America, Manhattan, KS, March 26, 2019 (**Divine, D.P.**).

ENWRA Annual Update. ENWRA Annual Meeting at NRD Legislative Conference, Lincoln, NE, January 29, 2019 (**Cameron, K.A.**).

ENWRA Update. NRD Managers, York, NE, August 27, 2019 (**Cameron, K.A.**).

Exploring Social Network Analysis as a Resource for Supporting Community-Led Stakeholder Engagement to Manage Water and Agricultural Challenges in Rural Communities in Nebraska and Pennsylvania. International Symposium on Society and Resource Management, Oshkosh, WI, June 4, 2019 (**Burbach, M.E.**).

First report of widespread polygonal ground in Nebraska and its association with eolian landforms. Joint Meeting of North-Central, South-Central, and Rocky Mountain Sections, Geological Society of America, Manhattan, KS, March 26, 2019 (**Joeckel, R.M.**).

- Full Range Leadership for Leaders in the Water Arena.* Nebraska State Irrigation Association, Water Leaders Academy, January 24, 2019 (**Burbach, M.E.**).
- Geology and Water.* Boy Scout Troop 81, North Platte, NE, April 30, 2019 (**Hallum, D.R.**).
- Giant, Bouldery Fluvial Bars in an Exhumed Miocene Paleovalley, Nebraska Panhandle.* Joint Meeting of North-Central, South-Central, and Rocky Mountain Sections, Geological Society of America, Manhattan, KS, March 26, 2019 (**Korus, J.T.**).
- GIS Modeling to Locate the Lone Star Ranch Spring.* Nebraska GIS/LIS Symposium, LaVista, NE, April 25, 2019 (**Hallum, D.R.**).
- Great Plains Ranchers Management for Vegetation Heterogeneity: The Need for Partnerships.* . International Symposium on Society and Resource Management, Oshkosh, WI, June 4, 2019 (**Burbach, M.E.**).
- How to Calibrate Your Fingers: A Guide to Improving Field Estimates of Soil Texture.* 2019 ASA-CSSA-SSSA International Annual Meeting. 2019 ASA-CSSA-SSSA International Annual Meeting, San Antonio, TX, November 13, 2019 (**Turk, J.K.**).
- Hydrogeologic Framework of Eastern Nebraska—Recent Deeper (Early Cretaceous to Cenomanian) Exploration.* Joint Meeting of North-Central, South-Central, and Rocky Mountain Sections, Geological Society of America, Manhattan, KS, March 27, 2019 (**Cameron, K.A.**).
- Introduction to Groundwater: Correcting Some Common Myths and Misconceptions.* Helena Agroindustry, Training Program for Sales Personnel, Ashland, NE, December 3, 2019 (**Korus, J.T.**).
- LiDAR Applications.* UENRD Board of Directors, O'Neill, NE, November 25, 2019 (**Hallum, D.R.**).
- Mapping the Boundary of the High Plains Aquifer in Nebraska with AEM and Hydraulic Head Data.* AGU-SEG Workshop on Airborne Geophysics, Davie, FL, June 13, 2019 (**Korus, J.T.**, and Polashek, J.).
- Nebraska GeoCloud Update.* Nebraska Water Industries and Nebraska Well Drillers Association, Kearney, NE, February 12, 2019 (**Korus, J.T.**).
- Nebraska's Groundwater Resources.* Nebraska Chapter AFS Rivers and Streams Technical Committee Conference, Aurora, NE, December 3, 2019 (**Young, A.R.**).
- Nebraska Spotlight: On-going Maintenance Needs for Phragmites in the Platte River.* USDA Water for Food Project Meeting, Lincoln, NE, September 26, 2019 (**Burbach, M.E.**).
- Northeast Nebraska Geology and Hydrogeology Overview.* Nebraska Water Conference, Norfolk, NE, October 9, 2019 (**Lackey, S.O.**).
- Observation of Common Field Soil Texture Methods by Video Analysis.* Soil Science Society of America International Soils Meeting, San Diego, CA, January 6-9, 2019 (Kemper - student of **Turk, J.K.**).
- Observations of Stream-Groundwater Interaction at Parcel, Ranch, and Reach Scale, West-Central Nebraska.* Joint Meeting of North-Central, South-Central, and Rocky Mountain Sections, Geological Society of America, Manhattan, KS, March 25, 2019 (**Hallum, D.R.**).
- Omaha Underground: Revised Stratigraphy and Significance of Upper Pennsylvanian Strata Below Nebraska's Largest City.* 2019 Annual Meeting of the Geological Society of America, Phoenix, AZ, September 25, 2019 (**Joeckel, R.M.**).
- Paleosols as Source Rocks for Uranium Deposits in Wyoming and Nebraska.* 2019 Rocky Mountain AAPG, Cheyenne, WY, September 16, 2019 (**Sibray, S.S. and Hallum, D.R.**).

Personal Empowerment – Continuing to Develop Your Leadership Capacity. Nebraska Water Leaders Academy, Nebraska City, NE, November 21, 2019 (**Burbach, M.E.**).

Precision Water Management. Microsoft/ University of Nebraska Marquee Partnership, Conversation, Lincoln, NE, January 22, 2019 (**Korus, J.T.**).

Securing Water for and from Agriculture through Effective Community & Stakeholder Engagement. American Water Resources Association, 2019 Specialty Conference, March 27, 2019 (**Burbach, M.E.**).

Surface and Groundwater Presentation. Girl Scouts Our Earth Our Future, North Platte, NE, October 5, 2019 (**Hallum, D.R.**).

Sustainability of Groundwater Resources: Myths and Realities of Water Balance. Nebraska Water Leaders Academy, Lincoln, NE, January 25, 2019 (**Korus, J.T.**).

Tapping into Your Motivation to Serve and Inspiring Others in Their Service. Nebraska Water Leaders Academy, Nebraska City, NE, November 21, 2019 (**Burbach, M.E.**).

TAPS in Context: Observations Provide Insights. Nebraska Department of Environment and Energy Environmental Quality Council, North Platte, NE, June 20, 2019 (**Hallum, D.R.**).

The Effect of Lighting Conditions on the Visual Determination of Soil Color. Nebraska Society of Professional Soil Scientists Symposium, Lincoln, NE, March 8, 2019 (Strand, Petersen, and UNL Soil Judging Team - students of **Turk, J.K.**).

The High Plains Aquifer; an Overview of Geology and Water Resources in Nebraska. Sandhills Discovery Conference, Ainsworth, NE, July 11, 2019 (**Young, A.R.**).

The Relationship between Surface and Ground Water at Spring Creek. Water Riches Field Day, Keystone, NE, April 29, 2019 (**Hallum, D.R.**).

The Surface Water and Groundwater of Nebraska. Nebraska Youth Range Camp, NCTA, Curtis, NE, June 11, 2019 (**Hallum, D.R.**).

Understanding the Hydrogeological Characteristics of an Aquifer and Groundwater as a Natural Resource. Water Topics for Teachers, American Ground Water Trust, May 30, 2019 (**Waszgis, M.M.**).

Untangling Geological and Hydrogeological Complexity in Northeastern Nebraska Using Multiple Methods. Nebraska Department of Natural Resources Brownbag Seminar, Lincoln, NE, May 24, 2019 (**Korus, J.T.**).

Water for Ag Project Update. Water for Ag Annual Meeting, Mesa, AZ, October 15, 2019 (**Burbach, M.E.**).

Water for Agriculture and Local Leadership Teams. Central Platte Region Local Leadership Team, Wood River, NE, February 5, 2019 (**Burbach, M.E.**).

Water in West-Central Nebraska. LincUP Lincoln County–Union Pacific Community Advisory Panel, North Platte, NE, February, 25, 2019 (**Hallum, D.R.**).

Where Does Your Water Come From? Workshop at Legacy of the Plains Water Ways Exhibit, Scottsbluff, April 4, 2019 (**Burbach, M.E.**).

World Water and Geological Background for Understanding Groundwater in Nebraska: Nebraska Water Leaders Academy 2019. Nebraska Water Leaders Academy, Lincoln, NE, January 25, 2019 (**Joeckel, R.M.**).

Awards Attained by CSD Personnel and Students in 2019

UN-L Soil Judging Team: 1st in Group Judging and 3rd Overall in National Contest at San Luis Obispo; 1st overall at the Region V Contest for the third year in a row (Turk, J.K.)

University of Nebraska Board of Regents Kudos award: (Joeckel, R M., co-recipient for work on “Cherish Nebraska exhibit at University of Nebraska State Museum).

Organizations for which CSD Personnel Fulfilled Requests for Information, Consultation or Services in 2019

Adaptive Resources, Inc.
Alfs Well Drilling
American Association of Petroleum Geologists
American Geophysical Union
AmeriCorps
APEC Climate Center, South Korea
AquaGeo Frameworks
Atarah Management Holdings LLC, Long Pine, Nebraska
Battelle Memorial Institute
California State University-Long Beach
Canadian Centre for Meteorological and Environmental Prediction, Dorval, Canada
Central Platte NRD
China Science and Technology Network
Chinese Academy of Sciences
City of Omaha, Nebraska
Clerk of Nebraska Legislature
College of Architecture, UN-L
Countryside Community Church (Omaha)
Dougherty Water for Food Global Institute
Duck Creek Ranch
EA Engineering
Eastern Nebraska Water Resources Assessment
Groundwater and surface water levels/temperatures along the South Platte River
Groundwater-surface water interaction on Duck Creek Ranch, Nebraska Hyannis High School, Nebraska

HDR, Inc.
I2M Consulting, LLC (Houston, TX and Seattle, WA)
IANR Education Abroad Program
Institute of Geomatics and Civil Engineering, University of West Hungary
Institute of Technology, Bombay, India
Jacobs Engineering Group
Lewis and Clark NRD
Little Blue NRD
Lower Elkhorn NRD
Lower Loup NRD
Lower Niobrara NRD
Lower Platte North NRD
Lower Platte South NRD
Met European Research Observatory, Italy
Middle Niobrara NRD
Nanjing University, China
National Association of Boards of Geologists
National Association of State Boards of Geology
National Parks Service
Nebraska Association of Resource Districts
Nebraska CarbonSAFE
Nebraska Department of Environment and Energy
Nebraska Department of Health and Human Services
Nebraska Department of Natural Resources
Nebraska Environmental Trust
Nebraska Extension Flood Response Team

Nebraska Game and Parks Commission
 Nebraska Oil and Gas Conservation Commission
 Nebraska Public Power District
 Nebraska Society of Professional Soil Scientists
 Nebraska State Irrigation Association
 Nebraska Water Center
 Nebraska Well Drillers Association
 Nemaha NRD
 North Platte NRD
 Papio-Missouri River NRD
 Pennsylvania State University
 RTA Petroleum LLC
 Rural Futures Institute, UN-L
 School of Biological Sciences, UN-L
 Shallow Exploration Drillers Clinic
 Shannon-Wilson, Inc.

Strategic Discussions for Nebraska
 Thiele Geotech
 Tri-Basin NRD
 U. S. Geological Survey
 Universidad Estadual Paulista, Rio Claro, Brazil
 University of Arizona
 Upper Elkhorn NRD
 Upper Niobrara-White NRD
 US Forest Service
 USDA Conservation Stewardship Program
 USDA Natural Resources Conservation Service
 USDA Office of Operations
 U. S. Geological Survey
 Westminster Presbyterian Church (Lincoln)

Selected Objectives for 2020

- Two geologic mapping projects will be completed for the U.S. Geological Survey STATEMAP Cooperative Geologic Mapping Program
- Continue improvements of Nebraska GeoCloud, Oil and Gas Database and Test Hole Database; contribute to upgrade of Agrichemical Database
- Eastern Nebraska Water Resources Assessment (ENWRA)
- Identification of irrigation-precipitation feedback mechanisms in Nebraska
- Meteorological-data based estimation of evapotranspiration rates and their long-term trends across the coterminous US
- Characterizing the geologic and hydrogeologic frameworks of eastern Nebraska using AEM
- Investigation and characterization of aquifer-bearing Cenozoic fluvial sediments of the High Plains
- Investigation and characterization of Pennsylvanian bedrock in Omaha area (Omaha CSO Project)
- Evaluation of watershed-scale groundwater transit- time distributions from field sampling and numerical modeling
- Groundwater transit times and nitrate delivery to Bazile Creek, Nebraska
- Hydrologic monitoring and groundwater age-dating in the upper Little Blue River Basin
- Watershed Science Education: Multi-Agency Collaboration
- Installation of sampling network for stable isotopes in precipitation
- Development of programming, facilitation of sessions, and evaluation of the Nebraska Water Leaders Academy

CONSERVATION AND SURVEY DIVISION 2019

16,058 feet of test holes drilled and/or logged

\$ Involvement in
3.35 million
of ongoing external funding



86,298
PAGE VIEWS
related to CSD

Supervised **21**
graduate students,
3 undergraduate
research students,
including **2 UCARE**



3,000+



STAKEHOLDERS served
by extension & outreach
activities

44

Publications,
including

**18 peer-reviewed
journal articles**



3 comments on scientific
journal articles
2 geologic maps
4 survey reports, bulletins
and field guides



45

Local, national
and international
PRESENTATIONS



108
TWEETS

91,000 impressions

489,216

**Groundwater level
data entries**

6,977

Groundwater quality results processed



831

CREDIT HOURS

Taught **10** different
courses in
4 programs



525

CONTINUING EDUCATION UNITS
(CEUs) generated for professionals

4

Media
interviews



**CONSERVATION AND
SURVEY DIVISION**

School of Natural Resources

127 YRS



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