Nebraska Ground Water Monitoring Advisory Committee (NGWMAC) & Nebraska Surface Water Monitoring Council (NSWMC)

Annual Joint Meeting

Tuesday October 20, 10:00 AM-12:00 PM

Meeting via Zoom:

https://us02web.zoom.us/j/81078838078?pwd=Qzhqd0dzZFlNNmdHdEtEVmlmZDRCZz09

AGENDA

1. Welcome and introductions
    a. Participants (56): Nemaha NRD (Chuck Wingert), NDEE (Marty Link, Dan Inman, Ryan Chapman, Mike Archer, Jeff Gottula, Dave Ihrie, Laura Johnson, Amanda Osborn, Tom Heatherly, Dave Miesbach, Tara Anderson, Dave Schumacher, Greg Michl, Tatiana Davila), LLCHD (Nate Hartman, Chris Schroeder, Brock Hanisch, Michael Gude), LLNRD (Tylr Naprstek, Jason Moudry, Dell Harris), UNL (Colleen Steele, Shannon Bartelt-Hunt, Aaron Mittlestet, Paul Hay, Xu Li, Dan Snow, Troy Gilmore), LRNRD (Scott Dicke), LENRD (Brian Bruckner), UENRD (Joslynn VanDerslice), USGS (Nathan Schaepe, Amanda Flynn, Brent Hall, Dave Rus, Ginny McGuire), NDA (Craig Romary), LPNNRD (Daryl Andersen, Tom Mountford), NDNR (Elizabeth Esseks), CPNRD (Courtney Widup), NARD (Dustin Wilcox), ENWRA (Katie Cameron), LPSNRD (Dick Ehrman), LBBNRD (Tyler Weishahn), NWC (Chittaranjan Ray), NEWF (George Cunningham), CSD (Aaron Young), OA (Karen Griffin), UNWNRD (Pat O'Brien), Tyler Goeschel, Josh Wilhelm, Lynn Webster, Jessica Johnson
    b. If you're new to the group and would like future updates, send an email to Dave Rus dlrus@usgs.gov (NSWMC) or Dan Inman dan.inman@nebraska.gov (NGWMAC)
    c. GW people wanting CEUs for today, send a request to dan.inman@nebraska.gov with your license number
2. Presentations:
    a. "Live Demonstration of the Enhancements to the Quality-Assessed Agrichemical Contaminant Database for Nebraska Ground Water (Clearinghouse)", Dave Miesbach and Ryan Chapman, NDEE
        i. Rollout slated for end of calendar year
        ii. Questions:
        iii. How to upload data? Still in progress, but they're meeting regularly with CSD about it;
        iv. Can the State Env. Lab upload data directly? Yes
        v. Will past data associated with newly added analytes be added? They'll take anything that there is a spot for, but that is at the discretion of the local stakeholders;
        vi. DNR registration number vs clearinghouse number – Still resolving
        vii. Will USGS data need to be loaded separately with the NWIS connection?
        viii. DO and pH will be newly added parameters
        ix. Will the data import into GeoCloud? Perhaps

x. Where will the quality flags go? They will still be part of the system at rollout.
xi. Static water level will be added each time it gets entered
xii. Polygons on the map will be a searchable filter
xiii. Is Dave Miesbach wearing Lederhosen? Yes

b. "Exploring COVID19 in Municipal Wastewater", Dr. Shannon Bartelt-Hunt and Dr. Xu Li, University of Nebraska
   i. Analytical method differences? Yes, different methods require different levels of concentration to be able to detect
   ii. This approach has applications to other pathogens (salmonella) and chemical constituents (e.g. illicit drugs)
   iii. Can concentrations be normalized to make them more comparable? Yes, potentially
   iv. How to make the data available quickly using experimental methods
      1. WRF study being used to normalize the SOPs
      2. If all of the labs stick to the same method, this helps
      3. Controls are used to QA the data
   v. How to convert these data to something actionable to health departments at a local level?
      1. Constantly trying to improve understanding of the life history of the virus to help inform the data
      2. Incorporating this into the health dept discussions – This data is one part of that discussion
      3. Hoping to focus on the ability to direct prevention to certain communities
   vi. How does the stage of the virus in a patient impact shedding into the wastewater? Still trying to find that out. Decay kinetics are also unknown. Temporal/spatial variability factors need to be sorted out.
   vii. Coordination is beginning to occur – largely driven by the wastewater community
      1. There needs to be an infrastructure investment into the collection system to make this approach viable long term
      2. Global researchers are trying to standardize the method
   viii. Have there been significant differences between WWTPs vs buildings? Its been a little more variable at the localized buildings
   ix. Cost effectiveness of this approach: $55/sample for analytical supplies plus salary and infrastructural costs;
   x. Sampling considerations
      1. Finding a representative and stable 'manhole' can be complicated
      2. Installing autosamplers is labor-intensive – This is one reason why having pre-existing infrastructure might be useful

3. Agency updates
   a. LENRD

i. Still struggling w/ toxic algae in the NRD lakes (Maple Cr and Willow Cr) and exploring options to mitigate it; Anyone have a silver bullet for HABs
ii. Some parts of counties are in the process of developing a GW management area; NO3 trigger: 20% of wells have 5-9 ppm NO3-N;
    1. Public outreach being planned during the pandemic is challenging
iii. Working to add some real time monitoring to some wells

b. USGS
i. Field operations have been stressed somewhat by pandemic, but data collection has mostly been uninterrupted
    1. Continuous water quality at 14 sites (many more w/ temperature)
    2. Stream sampling at multiple sites on the Missouri and in the Lower Platte River drainage
    3. Streambed chemistry in the lower Niobrara
    4. GW sampling near Ashland and for PMR-NRD
ii. USGS data delivery is being overhauled; Some platforms are being decommissioned as new platforms get stood up; Blog notes on the process.
iii. Many national publications/tools (that include Neb. data) have been released in the last 6 months as the NAWQA program sunsets – See recent national pubs list
iv. National monitoring program focus is shifting towards integrated water availability assessments (Next one likely to be HAB related in the Great Lakes drainage); There's a stakeholder feedback form at https://nrtwq.usgs.gov/nwqn/#/ if you're inclined to weigh in.

c. USACE
i. COVID hasn't impacted field work much this year
ii. ERDC lab has released an R package for using satellite data to detect algal blooms and Brent Dinkel has been using it to estimate Chl A concentrations in Upper Missouri R reservoirs

d. NDEE
i. HABs – Busy year (delayed a little w/ COVID); 8ppb criteria implemented; The new alert level has meant the same problem lakes are getting listed, just for longer; The occasional new lake has popped up (Calamus was a surprise, but the lack of rain might be the driver); Outreach kept the surprise level down for local communities;
ii. Fish tissue report coming out in the month; Last year in the Loup and middle X basin; ~140 advisories for mercury and 6 for PCBs; This year in the Niobrara;
iii. Stream bio program: Heatherly – In the Niobrara and things went smoothly
iv. Ambient monitoring: Missed the sampling in April but resumed after that
    1. Lake monitoring went as planned May-Sept
v. Basin rotation: 42 sites in the Niob; All but 1 week of sampling got accomplished – Things went well

e. LLNRD
    i. Calamus was a hotspot that led to several calls all summer
    ii. New GW sampling effort in phase 3 (area 30) to do nitrate isotope sourcing to characterize the sources
        1. New rule added to have sub-areas identified; 4-yr Median nitrates in some of these subareas were above the trigger level of 8.5 ppm
        2. Still figuring out how to do public meetings
    iii. Added Pibel Lake to the ambient monitoring
f. NGPC
    i. Trying to find good areas to target stream assessment work and trying to find areas where theres a need but no monitoring by other agencies
    ii. Fish management: Fate of fish in canals – What happens to those fish in canals and how does it impact decisions on listing species?
    iii. Legacy conference is virtual and going on now
    iv. Invasive species coordinator hired: Christopher Staehr
g. Water Sciences Lab
    i. Reopened in June and at 50% capacity; Sample analyses are happening again
    ii. 30 year anniversary open house got postponed due to COVID, but hope to have it next year
    iii. Ongoing webinar series, including tomorrow's with Dave Alvarez on passive sampling, http://www.waters.com/EnvironmentalMS
h. DNR
    i. Tom Riley will start as new director on Nov 2;
    ii. Have discovered that teleworking has been successful
    iii. LB632: Development of state flood mitigation plan – due by July 1, 2022
    iv. They've held some virtual public meetings as well as some socially distanced meetings; Elizabeth might be able to provide some tips, but it sounds like staying optimistic is important
i. CSD/Clearinghouse
    i. Data for 2019 from 20 NRDs and 2018 data from 1 NRD were added to the Quality-Assessed Clearinghouse for the fall update. We have over 510,000 analytical results representing about 29,300 wells. Approximately 139,000 of these results are nitrate results.
    ii. Approximately 3,700 pesticide results were added with the fall update.
    iii. We will be addressing outstanding issues from the 2019 processing with collaborating agencies in upcoming months.
j. LPS NRD
    i. Finishing Emerald and Greenwood (and several other communities) studies for GW management
    ii. Carbon black operation near Hallam will require a lot of water and they're looking into the supply available
        1. Near boundary with Nemaha and Lower Big Blue NRD boundaries so trying to coordinate with them as well

k. ENWRA
    i. 3 pilot study sites- Added metals to the analyte list
    ii. Added 2020 AEM map tab to the website (Google Nebraska GeoCloud)
    iii. Aquatroll and monthly sampling in the Firth well
l. Marty is retiring at the end of the year! Congrats Marty!

4. Monitoring council(s) business
    a. There have been many, many Nebraska WQ publications in the last year (See list below). There may be some helpful resources for the issues you're trying to solve
    b. Any meetings of possible interest to share?
        i. National Monitoring Conference, week of 4/19/2021, will be online, https://www.nalms.org/2021nmc/
    c. Fed. Advisory committee on water information (ACWI) has become administratively inactive, https://acwi.gov/

Some recent Nebraska-related publications of possible interest:

Abimbola, O.P., and others, 2020, Predicting Escherichia coli loads in cascading dams with machine learning: An integration of hydrometeorology, animal density and grazing pattern: Science of The Total Environment, v. 722, https://doi.org/10.1016/j.scitotenv.2020.137894

Alexander, J. S., McElroy, B., Huzurbazar, S., Elliott, C., & Murr, M. L., 2020, Deposition potential and flow-response dynamics of emergent sandbars in a braided river: Water Resources Research, 56, e2018WR024107. https://doi.org/10.1029/2018WR024107

Ali, J.M., and others, 2019, Assessing the Accuracy of Citizen Scientist Reported Measurements for Agrichemical Contaminants: Environ. Sci. Technol. 2019, 53, 10, 5633-5640, https://doi.org/10.1021/acs.est.8b06707

Beni, Nasrin Naderi, Daniel D. Snow, Elaine D. Berry, Aaron R. Mittelstet, Tiffany L. Messer, and Shannon Bartelt-Hunt, 2020, Measuring the occurrence of antibiotics in surface water adjacent to cattle grazing areas using passive samplers: Science of The Total Environment, Volume 726, P. 138296, https://doi.org/10.1016/j.scitotenv.2020.138296.

Cherry, Mikaela, and others, 2020, Recharge seasonality based on stable isotopes: Nongrowing season bias altered by irrigation in Nebraska: Hydrological Processes, in press, https://doi.org/10.1002/hyp.13683

Crawford, J.T., Stets, E.G., and Sprague, L.A. 2019, Network controls on mean and variance of nitrate loads from the Mississippi River to the Gulf of Mexico: Journal of Environmental Quality (48) 1789-1799. https://doi.org/10.2134/jeq2018.12.0435

Dudley, R.W., R.M. Hirsch, S.A. Archfield, A.G. Blum, B. Renard, 2020, Low streamflow trends at human-impacted and reference basins in the United States: Journal of Hydrology, Volume 580, https://doi.org/10.1016/j.jhydrol.2019.124254

Duerschner, Jon, and others, 2020, Swine slurry characteristics as affected by selected additives and disinfectants: Environmental Pollution, v. 260, https://doi.org/10.1016/j.envpol.2020.114058

Gibson, Stanford, and John Shelley, 2020, Flood disturbance, recovery, and inter-flood incision on a large sand-bed river: Geomorphology, Volume 351, https://doi.org/10.1016/j.geomorph.2019.106973

Juntakut, Pongpun, and others, 2020, Risk and Cost Assessment of Nitrate Contamination in Domestic Wells: Water 12(2), 428; https://doi.org/10.3390/w12020428

Mac, M.J., Palmer, S., 2020, Stakeholder Involvement in Natural Resource Decisions: The Missouri River: Fisheries, in press, https://doi.org/10.1002/fsh.10364

Naisargi, D. and others, 2020, Impact of an Extreme Flood Event on Streambank Retreat: Cedar River, Nebraska, USA: Journal of the American Water Resources Association, https://doi.org/10.1111/1752-1688.12828

Spurgeon, J.J., Mark A. Pegg, Kevin L. Pope, Lin Xie, 2020, Ecosystem-specific growth responses to climate pattern by a temperate freshwater fish: Ecological Indicators, Volume 112, https://doi.org/10.1016/j.ecolind.2020.106130.

Tenorio, F.A.M. and others, 2020, Benchmarking impact of nitrogen inputs on grain yield and environmental performance of producer fields in the western US Corn Belt: Agriculture, Ecosystems & Environment, vol 294, https://doi.org/10.1016/j.agee.2020.106865

Tesoriero, A.J., Burow, K.R., Frans, L.M., Haynes, J.V., Hobza, C.M., Lindsey, B.D., and Solder, J.E., 2019, Using Age Tracers and Decadal Sampling to Discern Trends in Nitrate, Arsenic, and Uranium in Groundwater Beneath Irrigated Cropland: Environmental Science & Technology 53 (24), 14152-14164, https://doi.org/10.1021/acs.est.9b03459

Young, S.L., and Kettenrign, K.M., 2020, The social-ecological system driving effective invasive plant management: two case studies of non-native Phragmites: Journal of Environmental Management, Volume 267, https://doi.org/10.1016/j.jenvman.2020.110612

Zhang, H., Tang, Z., Bishop, A. et al., 2019, Conservation significantly improves wetland conditions: evaluation of playa wetlands in different conservation status: Wetlands Ecol Manage https://doi.org/10.1007/s11273-019-09696-x

National publications including Nebraska data:

Covert SA, Shoda ME, Stackpoole SM, Stone, WW. 2020, Pesticide mixtures show potential toxicity to aquatic life in U.S. streams, 2013–2017: Science of the Total Environment, https://doi.org/10.1016/j.scitotenv.2020.141285

Hebert, Marie-Pier and others, 2019, The overlooked impact of rising glyphosate use on phosphorus loading in agricultural watersheds: Frontiers in Ecology and the Environment, vol. 17, no. 1, p. 48-56, https://doi.org/10.1002/fee.1985

Johnson, T.D., Belitz, K., Lombard, M.A., 2019, Domestic well locations and populations served in the contiguous U.S. for 2000 and 2010: Science of the Total Environment, v. 687, p. 1261-1273. https://doi.org/10.1016/j.scitotenv.2019.06.036

Medalie L, Baker NT, Shoda ME, Stone WW, Meyer MT, Stets EG, and Wilson, M., 2020, Influence of land use and region on glyphosate and aminomethylphosphonic acid in streams in the USA. Science of The Total Environment 2020; 707: 136008. https://doi.org/10.1016/j.scitotenv.2019.136008

McMahon, P.B., Brown, C.J., Johnston, T.D., Belitz, K., and Lindsey, B.D., 2020, Fluoride occurrence in United States groundwater: Science of the Total Environment, vol. 732, 139217. https://doi.org/10.1016/j.scitotenv.2020.139217.

Murphy, J.C., 2020, Changing suspended sediment in United States rivers and streams: linking sediment trends to changes in land use/cover, hydrology and climate: Hydrol. Earth Syst. Sci., 24, 991–1010, https://doi.org/10.5194/hess-24-991-2020

Musgrove, M., 2020, Groundwater quality in the High Plains Aquifer: U.S. Geological Survey Fact Sheet 2019-3055, 4 p., https://doi.org/10.3133/fs20193055

Norman, J.E., Barbara J. Mahler, Lisa H. Nowell, Peter C. Van Metre, Mark W. Sandstrom, Mark A. Corbin, Yaorong Qian, James F. Pankow, Wentai Luo, Nicholas B. Fitzgerald, William E. Asher, Kevin J. McWhirter, 2020, Daily stream samples reveal highly complex pesticide occurrence and potential toxicity to aquatic life: Science of The Total Environment, v. 715, https://doi.org/10.1016/j.scitotenv.2020.136795

Oelsner, G.P., Sprague, L.A., Murphy, J.C., Zuellig, R.E., Johnson, H.M., Ryberg, K.R., Falcone, J.A., Stets, E.G., Vecchia, A.V., Riskin, M.L., De Cicco, L.A., Mills, T.J., and Farmer, W.H., 2017, Water-quality trends in the Nation's rivers and streams, 1972–2012—Data preparation, statistical methods, and trend results (ver. 2.0, October 2017): U.S. Geological Survey Scientific Investigations Report 2017–5006, 136 p., https://doi.org/10.3133/sir20175006

Robertson, D.M., and Saad, D.A., 2019, Spatially referenced models of streamflow and nitrogen, phosphorus, and suspended-sediment loads in streams of the Midwestern United States: U.S. Geological Survey Scientific Investigations Report 2019–5114, 74 p. including 5 appendixes, https://doi.org/10.3133/sir20195114 plus interactive mapper at https://sparrow.wim.usgs.gov/sparrow-midwest-2012/

Ryberg, K.R., Stone, W.W., and Baker, N.T., 2020, Causal factors for pesticide trends in streams of the United States: Atrazine and deethylatrazine: Journal of Environmental Quality, V. 49, p. 152-162. https://doi.org/10.1002/jeq2.20045

Sarah M. Stackpoole, Edward G. Stets, Lori A. Sprague, 2019, Variable impacts of contemporary versus legacy agricultural phosphorus on US river water quality: Proceedings of the National Academy of Sciences, 116 (41) 20562-20567; DOI: https://doi.org/10.1073/pnas.1903226116

Stets, E.G., and others, 2020, Landscape drivers of dynamic change in water quality of U.S. rivers: Environmental Science and Technology, https://dx.doi.org/10.1021/acs.est.9b05344

Szabo, Z., Stackelberg, P.E., and Cravotta, C.A., 2020, Occurrence and Geochemistry of Lead-210 and Polonium-210 Radionuclides in Public-Drinking-Water Supplies from Principal Aquifers of the United States; Environmental Science & Technology, https://doi.org/10.1021/acs.est.0c00192

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Date/Time	Topics/Theme	Tenative Speakers
October 7, 2020 10:00 am CST	- Significance of mass spectrometry to emerging contaminants research - Environmental informatics and mass spectrometry	• Diana Aga, PhD NYSU Buffalo Chemistry • Randolf Singh, PhD University of Luxemburg Environmental Cheminformatics
October 21, 2020 10:00 am CST	-Innovative sampling through passive sampling -Sample processing for targeted and untargeted methods	• David Alvarez, PhD USGS Columbia Environmental Research Laboratory • Keil Brinster, Waters Corp
November 4, 2020 10:00 am CST	- New LCMSMS technologies, interfaces, and scanning techniques. - Challenges in PFAS method development	• Frank Dorman, Waters/Penn State • Kari Organtini, Waters Corporation
November 18, 2020 10:00 am CST	-Pharmaceuticals, personal care products and antibiotics in wastewater, water and soils - Historical Development of MS technologies	• Mike Meyer, PhD USGS Organic Geochemistry Laboratory • Larry Meeker, Waters Corporation
December 2, 2020 10:00 am CST	- Measuring cyanotoxins ppb levels water, soil, plants and fish tissue. - Anionic pesticides, glyphosate	• Stuart Oehrle, PhD Waters Corporation • Chasity Love-Nkansah, Syngenta Corp
December 16, 2020 10:00 am CST	- UPLC-MS of new classes of insecticides, herbicides and fungicides - Metabolite identification workflows using mass spectrometry	• Daniel Snow, PhD University of Nebraska Water Sciences Laboratory • Gordon Fujimoto, Waters Corporation

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Moderator/Host:

Daniel D. Snow is a Research Professor, and Director of the Water Sciences Laboratory, a part of the Nebraska Water Center and Robert B. Daugherty Water for Food Institute. Dr Snow's research has focused on the studying the environmental fate of emerging contaminants and agrichemicals in ground and surface water, and ways to use this knowledge to maintain productivity while also conserving the water and natural resources upon which agriculture depends.

For additional information or questions, please contact Scott_Toerber@waters.com.