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

Tuesday, October 24, 2017, 10:00 AM-1:00 PM
Lower Platte South NRD, 3125 Portia St, Lincoln, NE

AGENDA

1. Present: Matt Moser, Dave Bubb, Dave Schumacher, Dave Miesbach, Dave Rus, Dave Ihrie, Eric Prenosil, Greg Michl, Marty Link, Dan Inman, Sam Radford, John Bender, Tom Heatherly, Ryan Chapman, Dick Ehrman, Jason Moudry, Colleen Steele, Elizabeth Esseks, Anna Carlson, Ginny McGuire, Brock Hanisch, Paul Woodward, Jennifer Swanson, Adam Rupe, Daryl Andersen, Michelle Koch, Dan Snow, Shannon Bartelt-Hunt, Troy Gilmore, Karen Griffin, Katie Pekarek; Carla McCullough, Brian Barnes

2. Agency updates
    a. USGS
        i. New website at https://ne.water.usgs.gov/myscience/
        ii. Our director, Bob Swanson, is retiring at the end of the year
        iii. Ongoing stream sampling at NAWQA sites, in the Lower Platte Corridor, and on the Missouri River;
        iv. Groundwater sampling in the Lincoln wellfield, for the Papio-Missouri NRD, and wrapping up bedrock sampling in eastern Nebraska;
        v. Continuous water quality: Some sensors being removed for the season; New site on the South Loup and discontinued work on Cub Creek; Includes 3 continuous nitrate sites; https://waterwatch.usgs.gov/wqwatch/map?state=ne&pcode=00095
        vi. New Geocloud project might be relevant for conceptualizing aquifer vulnerability
    b. NDEQ-SW
        i. Human health ambient criteria coming out for microcystins (probably going to 8 ppb in December);
        ii. Ambient stream monitoring: Up to 101 sites(Added Lower Bazile); Quarterly metals analyzed by EPA R7; 30 lakes sampled
        iii. Basin Rotation just wrapped up North and South Platte Basins; Next year on the Republican and the Blue basins
        iv. EPA National Lake Assessment completed; Went fairly well. Starting on the EPA National River Assessment in 2018-19
        v. Fish Tissue data through 2016 available next week on NDEQ website; Total number of advisories went down some; Still analyzing sites with historical PCB issues.

vi. SNAP program using eDNA to look at local impacts of nutrients; Also collecting eDNA to track e.coli sources
vii. New state standards on hold pending gubernatorial review of all state rules/regulations
viii. Purchasing new IDEXX sealers for the NRDs pending trade-ins at the existing units at the NRDs
ix. Looking to purchase a microcystin autoanalyzer thingy; Where the data end up is still TBD; Will private sample results be used for assessment?
x. 319 program was funded for the next 5 years

c. NDEQ-GW
   i. The uranium mine at Crawford is not currently mining, but just in reclamation. Why? 1) since the Japan earthquake and tsunami, uranium price have really sunk. 2) NRC still slow on license.
   ii. GW has permitted the exploration holes for the niobium mine near Elk Creek (SE Nebr), but the proposed mine has to propose the waste water discharge. They are considering seriously a Missouri River discharge. Waste water from the deep mining they will be doing is very very salty.
   iii. A 3000+ foot deep monitoring well has been drilled near Sutherland to explore the suitability of deep formations for a possible Class I UIC well.
   iv. Annual GW Monitoring Report due to the legislature Dec. 1.
   v. http://deq.ne.gov/Press.nsf/pages/PR102417 Clean Diesel Rebate Applications accepted through Dec 13, 2017. Includes conversion of diesel irrigation pumps to electricity for 60% of the cost up to a maximum of $16,200.
   vi. Hope to get a grant to add data to the USGS National GW monitoring network;
   vii. Risk-Communication workshops: 2 day; 1st one in Bazile; Upcoming at Nemaha NRD, Hastings, Upper Big Blue NRD, and LPS NRD; Goal is to bring in all of the stakeholders (producers, agronomists,…)
      1. Source water grant money likely to have higher demand this year; RFP will be earlier

d. Quality-Assessed Agrichemical Contaminant Database for Nebraska Ground Water
   i. Data for 2016 from 21 NRDs and 2014 and 2015 data from the NDEQ were added to the clearinghouse in September. We now have over 487,000 analytical results representing over 28,000 wells. Approximately 125,000 of these results are nitrate results.
   ii. The clearinghouse web site will be updated by December with the newly added quality-assessed data. This update will also include non-quality inspected data for 2016 from the Nebraska Department of Agriculture for the ELISA (Enzyme-linked immunosorbent assay) data link, which is accessible from the Quality-Assessed web site. The website address is https://clearinghouse.nebraska.gov/Clearinghouse.aspx

iii. We will begin sending requests for 2017 data to collaborating agencies soon and addressing outstanding issues from processing the 2016 results. Nebraska Ag Chem Clearinghouse
iv. NDEQ is considering some updates with the Clearinghouse: Expanded analyte list (to include dissolved oxygen?); Maybe include non-water (like vadose zone)

e. NGPC
   i. Working on sharing information about what NGPC science is going on
   ii. Implementing the Cold Water Stream Plan;
   iii. Seeing declines in small fish in some streams that they're considering for listing (This will be a public process that will begin early next year if it begins)
   iv. Serving on GW Management Plan Advisory groups: They're willing to provide agency representation if desired; Just contact Michelle.

f. NDHHS
   i. Public drinking water program is being moved to the Atrium building;
   ii. 1st water-borne disease outbreak occurred last spring. (The subject of Anna Carlson's talk)

g. LPSNRD
   i. Airborne electromagnetic survey finishing up for eastern district; western next year; Wellhead protection areas getting flown;
   ii. Waverly drinking water protection plan ongoing will include Vadose zone monitoring;

h. LLNRD
   i. South Loup special monitoring study (partnering with USGS and NDEQ) to focus on bacterial source assessment

i. UNL-Shannon Bartelt-Hunt
   i. Her team has started some exploratory microplastics monitoring in urban lake sediments in Omaha via citizen science; Hope to continue the work; See factsheet attached
   ii. Nebraska Watershed Network: In transition right now; Elkhorn River research station to continue under UNO-biology; Citizen Science focus on the Elkhorn in 2018

j. Papio Missouri NRD:
   i. Reviewing/revising the districts GW Management plan;
   ii. Focusing on more monitoring in the areas of wellhead protection areas, especially where AEM data exist between Springfield and Gretna

k. DNR
   i. Trying to coordinate quantity planning efforts
   ii. Water-quality projects are eligible for the Water Sustainability Fund,
      1. Existing WSF projects in AEM are helping to assess vulnerability

3. Short presentations:
   a. Responding to a waterborne disease outbreak – Anna Carlson, NDHHS

i. Presentation to be posted; Lots of interest/discussion in what lessons can be learned from this event.

b. Getting water information out to the public – Katie Pekarek, UNL
   i. How do our communication strategies stack up when many of our stakeholders want information now and rely on social media to get answers?

4. Lunch featuring Phat Jack's BBQ

5. NSWMC and/or NGWMAC items that we didn't get to…
   a. Upcoming meetings:
      i. October 26-27; 2017 Nebraska Water Center Symposium, Lincoln, NE
      ii. November 7-9, 2017; Joint meeting of the NWEA, APWA, and AWWA, Kearney, NE, http://nebwea.org/images/conferences/2017-JFC/2017-Fall-Conference-Mailer-v3.pdf
      iii. November 29, 2017; Webinar: Multivariate Statistical Analysis in Water Quality; https://acwi.gov/monitoring/webinars/index.html
   b. Bringing our monitoring efforts to stakeholders and the public
      i. Last year's survey (https://www.surveymonkey.com/r/V6V2PXF) on the relative importance of water quality asked for ideas to improve outreach on the importance of water quality:
         1. *…I think buy-in by non-agency partners and linking it to either community or personal farm economics is key for GW nitrate…*
         2. *Promoting the effects that contaminants could have on the public through drinking water*
         3. *A multi-organization group should start a coordinated campaign bringing water quality issues to the public. Such an effort has a start, but we need to keep pushing on this.*
         4. *News articles and stories on what research is being done in Nebraska and why it is important*
         5. *PUBLIC SERVICE MESSAGES ON THE ISSUES RELATED TO NITRATES, URANIUM AND OTHER CONTAMINANTS DESCRIBING THE IMPACTS TO HUMAN HEALTH WOULD BE GREAT!*
         6. *Public/Stakeholders need to be better educated about the threats to water quality from contamination*
   c. Spring meeting of NSWMC: Date TBD, but presentations likely on: (1) How data support the permit process; (2) Findings from the USGS Midwest Stream Quality Assessment
   d. Recent publications:

Joseph D. Ayotte, Laura Medalie, Sharon L. Qi, Lorraine C. Backer, and Bernard T. Nolan, 2017, Estimating the High-Arsenic Domestic-Well Population in the Conterminous United States: Environmental Science and Technology, http://pubs.acs.org/doi/abs/10.1021/acs.est.7b02881

Barbara J. Mahler, Peter C. Van Metre, Thomas E. Burley, Keith A. Loftin, Michael T. Meyer, Lisa H. Nowell, Similarities and differences in occurrence and temporal fluctuations in glyphosate and atrazine in small Midwestern streams (USA) during the 2013 growing season, Science of The Total Environment, Volume 579, 1 February 2017, Pages 149-158, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2016.10.236.

Brinley Buckley, E. M., C. R. Allen, M. Forsberg, M. Farrell, and A. J. Caven. 2017. Capturing change: the duality of time-lapse imagery to acquire data and depict ecological dynamics. Ecology and Society 22(3):30. https://doi.org/10.5751/ES-09268-220330

Patrick W. Moran, Lisa H. Nowell, Nile E. Kemble, Barbara J. Mahler, Ian R. Waite, Peter C. Van Metre, Influence of sediment chemistry and sediment toxicity on macroinvertebrate communities across 99 wadable streams of the Midwestern USA, Science of The Total Environment, Volumes 599–600, 1 December 2017, Pages 1469-1478, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2017.05.035.

National Water Quality Monitoring Council, 2017, Water Quality Monitoring: A Guide for Informed Decision Making, https://acwi.gov/monitoring/pubs/WIS_2017_fs/Desgin%20Overview%20Factsheet%20NWQMC.pdf

National Water Quality Monitoring Council, 2017, Integrating Water Monitoring Data: Water Quality Indices, Report Cards and Multi-metric Web Portals, https://acwi.gov/monitoring/pubs/WIS_2017_fs/Indices%20and%20Metrics%20Factsheet%20NWQMC.pdf

Nowell, L.H., et al., Complex mixtures of dissolved pesticides show potential aquatic toxicity in a synoptic study of Midwestern U.S. streams, Sci Total Environ (2017), http://dx.doi.org/10.1016/j.scitotenv.2017.06.156

Nicole R. Schuster, Shannon L. Bartelt-Hunt, Lisa M. Durso, John E. Gilley, Xu Li, David B. Marx, Amy M. Schmidt, Daniel D. Snow, 2017, Runoff Water Quality Characteristics Following Swine Slurry Application under Broadcast and Injected Conditions, Transactions of the ASABE. 60(1): 53-66. (doi: 10.13031/trans.11370)

Song, K., et al., Relative importance of external and internal phosphorus loadings on affecting lake water quality in agricultural landscapes. Ecol. Eng. (2017), http://dx.doi.org/10.1016/j.ecoleng.2017.06.008

Michael W. Van Liew, Charles S. Wortmann, Daniel N. Moriasi, Kevin W. King, Dennis C. Flanagan, Tamie L. Veith, Gregory W. McCarty, David D. Bosch, Mark D. Tomer, 2017, Evaluating the APEX Model for Simulating Streamflow and Water Quality on Ten Agricultural Watersheds in the U.S., Transactions of the ASABE. 60(1): 123-146. (doi: 10.13031/trans.11903)

Microplastics in Nebraska

Shannon Bartelt-Hunt, Professor, Department of Civil Engineering, sbartelt2@unl.edu

Microplastics are defined as plastic pieces less than 5 mm. Primary microplastics are plastics produced for use primarily in personal care products (i.e. toothpaste, soaps, etc). Secondary microplastics are produced by weathering of macro sized plastics. The shapes of microplastics can include fibers, spheres and angular, irregular shapes. There have been many studies of marine microplastics, but terrestrial or freshwater microplastics remain under investigated.

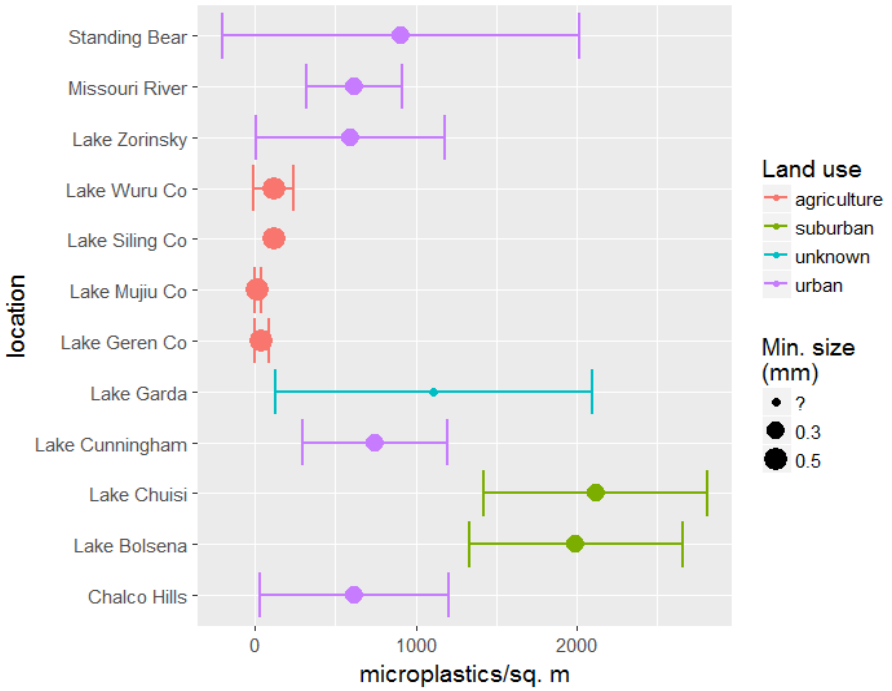

Figure 1. We observed high levels of microplastics in bed sediments along u waterways. (Bartelt-Hunt and Mahon). Average concentrations of micropla per square meter of bed sediments with error bars represent ± standard devia were collected from the literature.

In 2016, my Introduction to Environmental Engineering class conducted a study of microplastic occurrence in Nebraska, which represents the only data collected to date on microplastic occurrence in the state (to my knowledge). We evaluated the occurrence of microplastics in shoreline sediments from five waterbodies near Omaha. The concentration and sizes of microplastics observed are in Figure 1. A graduate student also evaluated the occurrence of microplastics in wastewater effluent and biosolids (Figure 2). In November 2017, my undergraduate environmental engineering laboratory class will again evaluate the occurrence of microplastics in surface waters around Omaha. Future work includes evaluating understudied transport routes for microplastics including air phase transport of fibers, the influence of land use on microplastic occurrence, the potential for microplastic occurrence due to land application of municipal biosolids and improved methods for citizen scientist generated microplastic occurrence data (grant in review at the National Science Foundation).

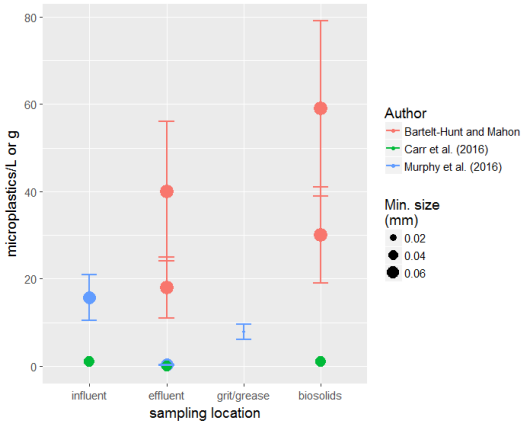

Figure 2 Microplastic occurrence has been studied in WWTP influent, effluent, and solids. We observed higher concentrations in biosolids in NE than previously reported (Bartelt-Hunt and Mahon) and expect this is due to both site to site variation as well as methodological differences