**Spring 2021 NADP (Virtual) NOS Minutes**

**Zoom Meeting ID: 989 5057 6751**
**Registration Link: https://zoom.us/meeting/register/tJwkcumtqT0tH9X1ITA_vqBSUcyGh4iQ-TTD**

Adopted Motions

1) Motion from Richard Tanabe: "Site operators to note what insect controls are being used and when in the field form. Allow minor use of pesticide within 30 m of the collector."
Mark Olson seconded. Motion carries.

2) Motion from Richard Tanabe: "Make a motion to remove boxes 5 and 6 from the AMoN site forms. But there will be no physical changes to the current form."
Eric Hebert. Seconds the motion. Any additional discussion? None. Winston Luke: Greater than 50 votes in support. The motion carries.

3) Motion from Zac Najacht. "For new NTN sites, do not use historical chemistry data comparison for determination of sample validity until the site has completed one year of sampling and is considered established. This would also include the requirement for any new analyte(s)." Second: Eric Hebert. The Motion carries.

**Wednesday May 12, 2021: 1430-1830 EDT**

**14:30-14:35 Welcome (Winston Luke)**
**14:35-15:10 CAL/NTN/AMoN Update (Chris Worley/Amy Mager)**

Staff update

- Chris Worley announced plans of retirement; to retire in roughly one year.
- Some lab members have been helping with sample grinding for litterfall samples and a staff member will be replaced by an undergrad.

a. Status of bag sampling

- Bag supplies were sent to sites between Oct – Dec 2020. Sites were asked to start as soon as supplies received. 96% of sites were converted to bag sampling by the end Feb 2021. 98% of sites converted as of May 9, 2021. Handful of sites haven't converted yet due to special studies at sites.
- Operator training sessions have occurred by Zoom. Site operators found these trainings useful to share experience with each other. Reduction in shipping costs & labor savings. Nice not to wash buckets.
- On-going supply shipping; proactive shipping model (spreadsheet tracks site supplies). Initial issues with supply and demand; evening out now. Tweaking schedule as needed. 20-25 supply boxes sent out each week.
- Glove recycling: started Jan 2021 with TerraCycle out of NJ which recycles gloves into composite flowerpots. Bag recycling: started April 2021 with a company out of IL, which recycles bags into composite furniture. Total for all recycling costs $5,000/year. Checking in with TerraCycle about recyling PETG bottles; unclear on options at this point.

**Chat:**
Donna Schwede : The recycling is a great initiative. A display on this for the fall meeting would be nice. TerraCycle has a lot of different programs and we used the company at my sons' school to recycle many items.

b. Wet Total Nitrogen/Phosphorous Sampler
   - SNIPIT (sampler for nitrogen and phosphorus in total). Current status: multiple iterations. Expect 5 of newest versions within the week. One SNIPIT will be installed within an arboretum using 2 NCON samplers w/single sensor. Two SNIPITs will be sent to John Walker for field testing. All chemistry tested has reported less than the MDL.
   - QuikChem method for both N and P. Allows for analysis of TN and TP from same digestate. TN applicable range: 0.005-0.5 mg N/L as NO2 + NO3
   - TP applicable range: 0.010 to 1.0 mg P/L. Reagents and hardware are in house for TP and TN methods. Unclear, but unsure whether there's any organic N in sample. Not seeing N values summing to be a negative; encouraging results. Questions raised on the TN/TP path forward. Are we filtering SNIPIT samples (acidified nitrate samples)? Need direction on this process. Review of CAL recent changes.

c. Proficiency testing:
   - ECCC rated the CAL "Good" (scale of poor, fair, good, and very good) out of 111 analytes. WMO rated "Good" for 3 samples, although 1 pH reading as marginally high. USGS SRS: found 10% MPV.

d. VIN Bag follow-up from fall conference.
   - Solutions are typically 2-3 x MDL. Found that all differences are below MDLs for all analytes. Also, blank solutions are performed to look for contamination issues; all below MDL. Statistical comparison of difference : VIN bags minus bucket concentrations to Degage bags; although n sample size was a bit small, so Greg Wetherbee recommended a permutation (randomization) test: a student under Jamie Schauer is particularly skilled with R statistics and did not find statistically significant differences using the permutation statistical testing in R.

e. Passive NH3 sampler evaluation.
   - Recent literature suggest that blue Radiello bodies produce low biased and most variable NH3 data compared against other NH3 samplers. Atmospheric Environment study found that blue Radiello had a negative bias; but could not decouple the effects from the effects of the body types from two different labs. More results to come.

f. IL-11 Sample Archive Update
   - Sample archive. 5-years worth of every sample with enough volume; oldest year rotated out – refrigerated. Forever sites, save every sample forever (WI06, IL11, NH02, NE15) are frozen. Fixed sites, save one sample per month (CA99, CO99, FL11, NC41, NY20, OR97, TN11, TX16, WV18,

WY00) are frozen. IL11 forever samples are now in Wisconsin. All samples out of the Biotron (temporarily stored samples in this storage facility) – cost savings.

- Many archive requests recently for special studies, avg 1/month: PFAS, COVID, blizzard, pollen (UT01 and NC30), wildfires, etc.

**Chat:**

From Greg Wetherbee : Are the WI93 samples from Eagle Heights also being saved for pollen analysis? I hope so.

From Mark Olson : The aerochem (93WI) samples are being collected for pollen analysis.

From Eric Uram : We have been collecting a separate sample just for the pollen study. No need for relying on a subsample from other program.

From Douglas Burns : With a TP detection limit of 0.01 mg/L isn't it likely that 98%+ of the samples will be less than detection limit values?

g. Data review and reporting.

- Data are reviewed and reported based on monthly data sets. The goal is 90 days after receiving data from lab. PO publishes data to the NADP website (goal = 30 days after receiving from lab).
- AMoN and MDN have been on track, but NTN have been more difficult to get on schedule due to additional challenges. Getting to 90-day review for NTN: weekly data/field ops meetings; notes from site operators lead to QR codes that must be reviewed.
- Program has been working with site operators to pre-screen chem data by Chris Worley for missing and problem values. Last 3 months doubled up the person-hours for NTN reviews. Approach review by QR code "B" first, which is the most likely to change. How to stay at 90 days for NTN reviews, branched vs linear data review. Review and resolve field operations within 1-2 weeks, gaps/overlaps, site ops, and precip issues.

h. Lab Info Management System.

- LIMS. Always trying to improve and enhance LIMS program and application; working on improving functionality, little things to save time. Also working on queries: reports run by staff right from LIMS; also helpful for sample info and data.

i. AMoN recoating studies

- Trying to improve AMoN budget by doing core dip coating in-house (dipper method). Currently AMoN costs $51k/year cost (pro version). Initial field testing comparisons of pro method vs dipper method compared well, until a 3-week study at a high-ammonia slurry pit near Mark Olson's house showed very significant differences between the two technologies (66.87 vs 21.05 mg/L).
- AMoN dip coating: found 5-fold differences between mean phosphate concentrations between pro and dipper methods, where pro version is much higher. Possible solution: reduce %

phosphoric acid – too "viscous" may limit penetration; double-dip; or heat/sonicate phosphoric acid during dipping. Acquired a free dipping station.

**15:10-15:45 HAL/MDN/AMNet/Litterfall Update (Mark Olson/Doug Burns)**

a. HAL Update
   - HAL and MDN moved from Eurofins in June 2019. 2019 QA report found, but resolved. MDN sample coding by lab ("A", "B", and "C" – where "C" = invalid). Found that "A" proportion is increasing over time; may be attributed to switch in bottles from glass to PTFE. HAL ongoing QA: acid bath and crock concentration (monthly) basis; solutions used to clean sampling train hardware. Did not find any exceedances. Moved to a different lab, which should improve acid cleaning operations. Found a single exceedance in the Type 1 water over 18 months. Perform bottle blanks. New MDN prep lab improvements in May 2021. Lab fume hood to be replaced after issues found. Lab is a former BSL-3 lab, all costs covered by State.

b. MDN Field QA
   - USGS system blank program NADP in 2022. Arboretum WI06, N-CON dual chimney to resume. Devil's Lake WI31 to 31WI MDN field duplicates study using N-CON dual chimney from July 2020 to present. Mount Horeb – Aerochem evaporation study to resume in summer; collector open loss or gain is complete. Lab – acidification study is complete.
   - WI31 MDN duplicates using N-Con Dual Chimney: 10 instances when the RPD > 10%. Resulted in a coefficient of regression ($R^2$) of 0.95.

c. MDN Evaporation Study
   - Acidification study. Is 20 mL pre-charge of 1% HCl sufficient for preservation? Took excess NTN samples for pH testing; store for 7 days and measure pH. pH 2.7 +/- 0.01.
   - Stability study pH collected on 0, 7, 14, 21, and 28 days. pH on 1L sample = 2.7 throughout study; pH on 750 mL sample = 2.6 throughout study.
   - MDN collector loss or gain study. Blank and spiked samples were placed in N-CON dual chimney. Collector was opened exposing funnel during non-precip events. Open a total of 73 hours through week (168 hours in a week). Spiked sample initial concentration = 5.05 ng/L. Spike after 7 days = 5.02 ng/L. Blank after 7 days = 0.01 ng/L < MDL. No problems identified.

Greg Wetherbee: I just put into the chat, was wondering if Guey-Rong Sheu has re-done his evap experiment with PTGE bottles because I think he did his experiments with glass and you're showing insignificant evaporation and mercury loss and Guey-Rong showed quite significant evaporation and mercury loss. I suspect that this loss is due to the contact between the thistle tube and the PTGE bottles that's so much better, so we've now solved that evaporative problem. But this need to be verified. Mark Olson is not aware of any evaporative study that he's done, but Guey-Rong uses a 2L PTGE bottle and a J-tube that David and Mark designed years ago. Mark Olson did see Guey-Rong's study on spiking where Guey-Rong sees significant losses, spiked with 10 ng and didn't see any later in the week. Greg Wetherbee: I saw some of his studies, but it's been a while, wasn't sure whether Guey-Rong now uses PTGE bottles or this previous work was with the standard MDN sample train.

Mark Olson: As far as evaporation study, the results look really good. Focused on AeroChem, but the results were even better with a trace of brominion chloride. Without brominion chloride, saw 80% recovery. Something that might need to be revisited.

d. AMNet Update 2021. Down to 13 sites, peaked in 26.
    - In 2020: lost IN21 and NY43; NY06 (Bronx) moved to NY98 (Whiteface). MS12 will move to Barrow, eventually.
    - Current network: 4 GEM-only and 9 are fully speciated. Last site visit was December 2019. Loaner program has been helpful for quick replacement of malfunctioning parts; 1135 to OH02 and NJ30 to minimize downtime.
    - 2019 AMNet data has been validated and QAR is near completion. 2020 QAR has not be started, but most data have been loaded.
    - A Wisconsin DNR trailer was donated to NADP in 2019, called the Midwest Mercury. US EPA interested in air quality in East St Louis, IL area. Trailer will be deployed June 2021. Trailer will be set up to analyze GEM and GOM and will run through December 2021. Mark Olson will train US EPA staff. Lots of industrial facilities in East St Louis, IL. Mark Olson was sampling there back in 2002, saw the highest ambient mercury concentrations in this area.

e. Status of MDN Reports.
    - Still working on these.

f. Hg Litterfall SOP
    - Litterfall was transferred to NADP in 2020. Reduced annual cost from $2,800 to $2,000. Lost 2 sites, but gained 2 sites. Total network is 21 sites in 2020. 2 hours in MELD dedicated to litterfall discussion. Collection techniques will remain the same, but analytical changes are proposed. Lots of effort to freeze dry large samples. Proposing taking a small subsample for processing instead of freezing and grinding a small sample.
    - For QA, there's excess samples from 2019 (8 collectors): will assess the variability with from 10% of these samples. Freeze dry, grind, and analyze. The compare triplicates to each other and original concentration. Will report again in 6 months (Fall conference).
    - MELD litterfall recap; only focusing on deciduous trees in the fall months. The network is missing coniferous, red oak, and other species. Pine needles fall all year, should these be sampled more frequently? Select core sites to expand measurements (lichens, moss, tree growth, canopy, bark, and dead fall)?
    - Litterfall is still a transitional network. Unclear what next steps are for Litterfall network. Spring 2017 it was approved as an NADP network. Adoption was opposed by ISWS Interim Director in Executive Session. Next steps? The Program Office is not here to advocate for creation of a new network, we're here to do what the community supports.
    - Doug Burns: I made a presentation and outlined the scientific background behind the importance of litterfall collections and had three Hg experts: Dave Krabbenhoft, Charley Driscoll, and Daniel Obrist. Found that wherever litterfall Hg is collected, it reports higher amounts than wet deposition of Hg. Charley Driscoll was sampling at Huntington Forest. Litterfall is a messier measurement than wet deposition; some sites are sampled year-round due to year-round

litterfall deposition in some regions. Daniel Obrist said we need to clarify the expectations of the network and what measurements represent. Will need to modify Marty Risch's 12-pt plan. Need to follow up with the panel. Data collection has been on-going since 2007. How long does it take to convert to a network after 14 years of sampling?

- Doug Burns introduced a motion, "The Hg litterfall network shall be a permanent NADP network". Greg Wetherbee: I propose an adjustment to the motion: "The Hg litterfall network will be an official NADP network using all data going back to 2020 and previously collected data will be considered valid will be considered valid and grandfathered in as appropriate". Winston Luke: Do we need to consider this motion here in NOS? Doug Burns: Or do we need to bring this up in Exec? Greg Wetherbee: Addition of new networks is really a Joint subcommittee issue because resources will be spent on this network that will affect other networks. Doug Burns: I think this needs to be brought up in Joint. David Gay: This motion to make it permanent would need to be brought up in Exec. EOS can propose this. Winston Luke: We can go over this tomorrow in tomorrow's Joint session.
- Camille Danielson: will this have to have a QAPP? Current QA routines are ad-hoc in a spreadsheet; seems things need to be treated more properly – including data review and data posting. Mark Olson: Data review, data hosting of archived Litterfall data. Changing to an official network, would require staff hours to manage.
- Greg Wetherbee: One complication is data access. If made into an official network, these data must be publicly available through a USGS data release or NADP website. Doug Burns: All Litterfall are all available on USGS data release. Greg Wetherbee: Burden of data hosting on either USGS or NADP. Maybe keep on USGS, but provide a link through NADP. Camille Danielson: Not as simple as flick a switch when becoming an official network, lots of QA work involved. Doug Burns: Maybe consider working with Tribes for these data.
- David Gay: Any changes recommended in MELD for changes within the lab operations? Mark Olson: Tried to document changes so there's no step function change. Greg Wetherbee: In Fall conference when you present variability data; you will have to show the possible step function change that could occur. Already these samples have a high degree of variability due to the nature of solid collections. Mark Olson: Changes in concentrations is very tight. Doesn't see that they'll see huge differences. Colleen Flanagan-Pritz: Willingness of Mark Olson to review these data, maybe there would be a review panel to discuss the data prior to Fall Conference MELD meeting.
- Mark Olson: Hope to get these data turned around by end of summer 2021 to process 2020 samples. Hope for data and a meeting prior to MELD. Doug Burns: Another suggestion; could you oven-dry samples for a few days large bulk samples. But this may impact methyl mercury.
- Doug Burns: Is methyl mercury important for litterfall? Mark Olson: Not important, but someone mentioned that it's important. David Gay: Suggests doing total mercury instead of methyl. Winston Luke: Should we consider the motion tomorrow? Greg Wetherbee: Yes, discuss tomorrow.

**15:45-16:15 Quality Assurance Update (Camille Danielson/Martin Shafer)**

a. General Update

- Camille Danielson: Internal audit. Did a systems internal audit of the CAL and HAL 12/2020. Only 11 findings and ~15 recommendations; most are resolved (documents, SOP management, list of spreadsheets use in the lab, and traceability issues). Metadata out of date, sample IDs not on web, and need "q" codes. Equipment thermometer verification overdue. Customer service survey sent to 400+ NADP customers.
- NTN MDLs IC and FIA. MDL remained the same in 2021 vs 2020, 2021 NTN MDL based on processed bag blanks. NTN network MDL is used for QC assessment at the bench and report/website reporting. Results will not shown values below the MDL, will only report the MDL. Sodium MDL is the same; Calcium significantly lower MDL.
- AMoN and MDN MDLs. AMoN MDL uses bench level QC. MDN MDL based on travel blank. MDN MDL did not change this year.
- AMoN Field QC duplicates, 308 pairs sent in 2020. 90% of 308 sets <15% RSD. AMoN Field QC travel blanks 2020, shows the mean travel blank 0.35 ug/m3. None of the travel blanks exceeded the criteria. AMoN travel blanks are trending down; looking good for cleanliness. AMoN supply testing in the lab (e.g., jar blanks and preparation blanks). Some jar blanks exceeded criteria, will continue to monitor. < 3% of AMoN QA routines have exceeded criteria.
- NTN supply QC. Zero bags exceeding criteria. Issue with lids; started having exceedances due to new lids; found out that new and used lids were failing consistency; new cleaning routines attempted. Tracked down Henry Lab contamination; possible not clean enough on the Henry Lab desk contamination.

**Chat:**

15:50:35 From Mark Olson : I'd like to propose we commit more time at the Spring meetings to NOS. It's clear we have a lot to cover and this is our only time (the Spring) to dedicate this time. We NEED a full day to NOS! Does that need a motion?

16:08:18 From Donna Schwede : I think the proposal for the TDep virtual meeting was only for the Fall meeting.

16:09:25 From Amanda Cole : Yes, Donna is correct, it was mostly not to conflict with the CLAD workshop in the fall

16:10:09 From John Walker : Correct, TDep virtual is only proposed for fall meeting

b. It's Raining Frogs?!

- Eric Hebert: Only a few sites have frog guards. Should frog guards be installed at all sites, or should they be tested? Mark Olson: We should look at data completeness with and without the frog guard. I think use of the screen is better than collecting frogs. Do we need collocated studies with and without the frog guard. Dana Grabowski: This site is FL11; they have very good data.

- Camille Danielson: when was this deployed? Eric Hebert: Unclear when this started. Likely when the samples started becoming cleaner. Camille Danielson: Recommend looking at this more. Mark Olson: Data completeness in the mid-35s; likely put the screen on in Jan 2021 and collection efficiency around 100%.
- Winston Luke: Can we do testing at Eagle Heights? David Gay: Suggests comparing gage with filter against PRISM. Data will be reviewed
- Camille Danielson: Review in QAAG, then NOS in the Fall.

**Chat:**

15:53:02 From Andrew Johnson - Maine DEP : With the reported world-wide decline in amphibian populations, I guess this is a "good" problem to have, no? :-)

16:00:13 From maria jones : We are heading into the rainy season in Florida, and it rains a lot!! Does that mesh going to make any difference during the rainy season. Torrential rains!!!

16:11:56 From maria jones : The gage is the equipment that is mostly impacted.

16:13:18 From maria jones : The site operator will not know there are creatures in the gage unless they have to dismantle it.

c. <u>Approved Wasp Sprays for Field Use</u>
   - Site operators need to know what they can use for insect control. Anything that's approved or not approved? Richard Tanabe: operator safety comes first; they need to use whatever will work. Need to write down what they use to stay safe.
   - ****Motion: Richard Tanabe: Site operators to note what insect controls are being used and when in the field form. Allow minor use of pesticide within 30 m of the collector.**
   - **Second: Mark Olson**
   - **Motion carries.**
   - **** Motion: Mark Olson: Dedicate a full day to NOS in Spring.**

d. Use of Met and Leaf Cover Data on AMoN Field Forms

- AMoN field form leaf cover and "weather". Issues raised on field form. Site observations during filter removal and meteorological observations. Neither of these items are used by the CAL for data review. Should these continue be collected by site operators?
- John Walker: Has not used these site forms for leaf-out or meteorological observations; he relies on other sources of meteorology to address those questions. David Gay: Thinks the questions asked were for Henry's Law work. Eric Hebert: Most of the information asked in the AMoN form are already asked within the CASTNET form. John Walker: This information may have served a point earlier before leaf-area index information was available.

- **Richard Tanabe: ** Make a motion to remove boxes 5 and 6 from the AMoN site forms. But there will be no physical changes to the current form.**
- **Eric Hebert: Seconds the motion.**
- **Any additional discussion? None.**
- **Winston Luke: **Greater than 50 votes in support. The motion carries.**

**Chat:**

15:41:48 From Melissa Puchalski : We have the data in the CASTNET database but no longer use it because we use tdep (cmaq) for the deposition velocities

15:44:36 From Mark Olson : If we're not recording the data no point in gathering it.

15:51:11 From Greg Wetherbee : Melissa: If you have that CASTNet Foliage Data, we should be giving that to the National Phenology Network.

**16:15-16:30 Data Quality Objectives Summit and Workgroup (Camille Danielson/Martin Shafer)**

*Moved to May 14, 2021

**16:30-16:45 USGS External QA Report (Greg Wetherbee)**

*Moved to May 14, 2021

**Chat:**

16:25:13 From Greg Wetherbee : Data for sensor sensitivity has been part of my USGS External QA Reports forever. You can learn about how these different sensors affect NADP data in: https://www.sciencedirect.com/science/article/pii/S0269749116326999?casa_token=ZMR0zG3MFKMAAAAA:w_4gNx0F2TWd_BgAya9NNkpuOkasA07hH7zucScQxwggD-FlUIUTuzFSFPYozbis8TV2UGm-Z8w

**16:45-17:15 Network Equipment Depot and Equipment Testing (Mark Olson/Richard Tanabe/Bob Larson)**

a. Eagle Heights (Olson)

b. KJJ NTN collector testing (Olson)

- 10 posts with power. KJJ NTN, NCON NTN, Aeorchem NTN, Ott Pluvio raingage, etc.
- WI93, 93WI, and EX93 -> Ott Pluvio + KJJ.
- Also have a site at the Arboretum, WI06 and 06WI. Two NCON samplers are connected attached to the same sensor. WI93 NTN and MDN NCON exposure. 5.17 hours vs ? NCON vs ACM: 5.17 hours (34 cycles) vs 3.75 hours (4 cycles). ACM is only collected large precip samples. Study period April 13 to present; no rain in first 2 weeks. The ACM did not collect anything, but the NCON did sample 7 mm of precip. Arboretum vs Eagle Heights are seeing significant precip differences although only 5.3 km apart.
- Sample catch efficiency. KJJ sampler: pros: uses a linear actuator, cycle and hour meter, and wet and dry side toggle. Cons: open cell foam lid seal (basically a sponge) – modified upon arrival, sensor grid grounding activates collector; birds love this sensor.
- In the Fall 2021 conference, will add to data. WI06 and WI93.

**Chat:**

16:38:03 From john offenberg : Mark, et al., recall that at NC30 we (due to PFAS Special Study triplicate sampling) are running a simlar comparison of 3 NTN N-Con samplers. John Walker should speak to the details of sensor data recording relative to Rain Gauge (independently operating on 3 separate Theis rain sensors). I think my point is that whlie our focus has been / is on PFAS there is a set of data related to your effort, I think. So far ~ 6 months w/ differing operational set-up... for future/forthcoming comparisons.

16:41:09 From John Walker : Thanks, John O. Yes, I'd be happy to summarize a triplicate NCon comparison from Duke Forest at some point.

16:43:12 From Mark Olson : John x 2, I'd be happy to include the data in my next presentation of capture efficiency/performance

c. Operator training and Outreach (Tanabe)

- Improve operator engagement. Started in Feb 2021, meetings every other month based on feedback from site operators. Roughly 50-60 participants in the first two sessions. No registration required, should it be? Are the same people attending? Outreach – operator turnover is a continuing challenge. Many sites are good about updating information, but many do not let us know. PO exercise to review field note initials to check site operator. Operator of the year certificates – new idea.

**Chat:**

16:40:03 From Winston Luke : I will definitely nominate Hoss for special recognition!

16:41:33 From Mark Olson : I'd also like to say RT is doing a fabulous job with this training and outreach!!!

16:45:17 From Winston Luke : Yes, kudos to RT for his efforts on training and outreach. Site operator of the year - great idea, and Hoss can be the very first! We'll have to figure out a good way to announce/communicate this.

d. PO Update on Utilizing Site Survey Results

- In Spring 2020 meeting, was identified that PO needs to improve review of EEMS spot survey reports. Summarize on a quarterly basis with site funding agencies. Monthly meeting between PO/EEMS/USGS. EEMS shared their calendar. PO Sharepoint site, EEMS field team has access. PO knows where EEMS is headed. EEMS is still creating trouble tickets. Quarterly summaries: summarize quarterly results and communicate to site sponsors; indicate past performance, etc. Keep site operators engaged.
- Virtual site survey. How does the PO keep sites engaged and aware of their sites. Ideally something that can be done by phone. Sites with no internet -> hard copy. Focus on site photos, equipment photos, vegetation height around collector(s) and raingage, 45 degree rule and 30 degree guidelines.
- Site operators can take photos; hopefully site operators will fix problems.

**17:15-17:45 NADP Site Survey Report (Eric Hebert)**

*Moved to May 14, 2021

**17:45-18:00 Siting Criteria Workgroup (Tim Sharac)**

*Moved to May 14, 2021

**18:00-18:15 Comparison of NTN Chemistry to Site Historical Data for Determination of Sample Validity (Zac Najacht)**

- NADP NTN prelim data review dealt with on a monthly basis. Sample validity is determined, in part, based on presence of visible debris in sample and comparison of individual analytes chemistry data to site historical values. Individual analytes, pH, etc. are compared against historical averages, which is used within screening level (SL) coding. Compare pH and conductivity against $10^{th}$ and $90^{th}$ percentiles; which are composited into "SUM" scores within LIMS system. Sample contamination flagged within field and lab observations. Analytical chemistry data uploaded from chemistry lab. SL score and SL code. If SL composite score is 4 or higher and debris is visible, then automated SL score of "C", which means invalid sample. Site operators do reach out to the PO asking on what sites can do to reduce frequency of "C" coded data. Two criteria: "New" NTN sites vs "Established" NTN sites. "New" sites require 10 submitted samples that are not "grossly contaminated". After 10 samples have gone through preliminary review, site considered "established". Could vary greatly from site to site due to location or season. N=10 sample size may lead to a high probability of new maxima being achieved.
- Proposed adjustments to SL coding. Substitute one full year of samples from the sites before applying SL coding for validation instead of 10 samples at new sites. Propose to evaluate and determine a set time period to apply recent site history for SL Coding comparison (i.e., 10, 15, or 20 years) instead of complete data history.

- **** Motion: Zac Najacht. For new NTN sites, do not use historical chemistry data comparison for determination of sample validity until the site has completed one year of sampling and is considered established. This would also include the requirement for any new analyte(s).**
- **Second: Eric Hebert.**
- **** Motion passes.**

- David Gay: Move this proposed second motion on "established" sites to QAAG:
- For established sites that have completed one year of sampling, limit historical comparison to a set time period of recent years of the site's analytical chemistry data. This needs further evaluation before determining.
- John Offenberg: Zac, have you considered similar criteria in order to add a new analyte at an established site (as opposed to adding a new site)? Does this mean that less than one year is impossible for a new analyte (or a new site)? Bob Larson: samples are valid unless invalidated by debris found. John Offenberg: interested in fluorinated fluxes; very important to know whether a sample is valid or not. John wants to know if they would need a full year's worth of data. Bob Larson: Also suggesting the use of network-wide percentiles for when less than a year of sample data exists. Greg Wetherbee: "C" coded data are hidden from public use, and "C" codes affect the use of the data for data completeness requirements to be included within the map.

**Chat:**

17:00:27 From Robert Brantlinger : I have been receiving "C" ratings on dry samples (No sample in Bucket), the rain gage recorded .01" of precipitation. Previous years dry samples were rated A.

17:04:42 From john offenberg : Zac, have you considered similar criteria in order to add a new analyte at an established site (as opposed to adding a new site)? Does this mean that less than one year is impossible for a new analyte (or a new site)?

17:25:48 From Timothy Sharac : ** Motion: Zac. For new NTN sites, do not use historical chemistry data comparison for determination of sample validity until the site has completed one year of sampling and is considered established. This would also include the requirement for any new analyte(s).

17:28:21 From Amanda Cole : Zac, we don't have the same automated scoring for CAPMoN but we do compare to the previous 5 years of data when finalizing

17:28:23 From Andrew Johnson - Maine DEP : Move to Adjourn.

17:29:26 From Zac Najacht : Thanks Amanda. We will definitely be looking into what other networks are doing in our evaluation.

Donna Schwede moved to adjourn. Greg Wetherbee seconds this motion to adjourn.

The meeting ended at approximately 17:30.

**Friday May 14, 2021: 1030-1200 EDT**

**May 14, 2021. Note: NOS meeting ran out of time on Wednesday and was re-started on Friday.**

**10:45-11:15 NADP Site Survey Report (Eric Hebert)**

- 2020 Site Survey Report; some site audits were cancelled (Canada, etc). 62 sites, 79 collectors, 62 rain gages. Performed ~24% of sites. There are now 20 more sites on the list of not meeting each site every 4 years.
- As-found electronic raingage accuracy, very accurate at weighing sample weights. Inactivated ACM sensor temperature, show most ACM sensors reach max temp within 6 minutes. Sensors are still working. Still needed to tighten N-CON set screws, which leads to poor lid seal on the bucket. Approximately 50% of sites have non-tightened set screws, even with Loctite.
- What did EEMS see in the field? Maintenance issues, equipment issues, and siting criteria failures. Found broken battery terminals, broken/cracked batteries, broken wiring connections in need of repair. Also seeing ETI sensor corrosion; applying dielectric grease to address corrosion issues in ETIs. Richard Tanabe and Bob Larson have been talking with ETI manufacturer to address equipment failures.
- Belforts were found to cross-over problems above 6" of rain, the pen goes off the paper. The gage bucket was found to be filled, the site operator found that the bucket didn't need to be emptied. Many sites using herbicide to control vegetation around samplers, as noted in audits. ACM lid seal problems; historically lid seals were sent new ones every year, but left to discretion of site operator; ultimately resulting in lid seal problems. EEMS reminds site operator to request new lid seals. EEMS works to tighten lid hardware. Some sites having problems with plastic bags. Camille Danielson: can we request lid-seals be replaced annually? David Gay: new bucket and new lid seal every year would be a good idea. Amy Mager: we will discuss further.
- Insects infestation. OTT cleaning routines, some need attention due to mud dobbers, snakes, etc. Widespread use of pesticide to address insect infestation.
- OTT firmware being updated, can also do direct calibration checks. N-CON motor spacers: foam to keep motors in space, or some other factory-option.
- Frog screen. EEMS sees this as an unapproved equipment modification.
- Found that many extra bottles are being shipped.
- Site operator – first site survey, site operator changed sample on a Wed one day, then the site operator kept sampling on Wed over the next few years?
- Drone videos shown. At site AR03, many siting violations; but there's land on this property that would meet siting criteria without trees being cut down. Concentric circles around the collector can be shown on the drone image.
- Found numerous positive longitude values that need to be updated.
- New news: replacing Belforts with OTT gages for NADP PO. Installing GOES data transmission at USGS sites.

**Discussion:**

- Eric Hebert: maybe virtual site survey would include an inspection of lid seals and buckets. David Gay: doing a FaceTime of a site would be very helpful. Richard Tanabe: said video of 45-degree rule violations would be very helpful. Not many lid seals are being replaced, seeing old Illinois Water Survey stickered-lid seals.

**Chat:**

10:03:43 From Camille Danielson : How expensive are lid liners?

10:04:26 From Camille Danielson : Could we just go back to sending all sites new liners once a year?

10:04:51 From Chris Worley : Agree!

10:05:43 From Camille Danielson : We have lots of buckets now! We could also send them a new bucket once a year - replace liner and dry side buckets and maybe wet side buckets annually?

10:05:58 From Winston Luke : I was thinking the same thing - the liner condition is extremely important for data quality - let's revisit automatic shipping?

10:06:27 From David Gay : agreed. a new liner and bucket every year or two might be worth it.

10:07:08 From Amy Mager : Yes, we will discuss. We can easily do a yearly replacement of both wet and dry buckets. I'll talk with NED about new lid liner each year.

10:07:13 From Camille Danielson : No Hg thermometers - insist they remove it!

10:10:41 From Mary Lynam : I kept a couple of spare buckets at the ANA-115 site. My dry side bucket freezes in the winter time and I have to leave it to thaw and then use my spare bucket to put in the dry side. It never hurts to have one of two spare buckets on site.

10:11:49 From April Hathcoat : I'm curious what you used to remove the ants.

10:14:07 From john offenberg : what is the 'active ingredient' in Never-Seez? any chance it is per-fluorinated?

10:16:31 From Amy Mager : We have been communicating with sites to find out what is on hand and ask them to send back. Also developing an on line inventory program they can fill out each week so we can adjust what we send them.

10:17:55 From Kulbir Banwait : The screen on the opening of the gauge may prevent frogs to go in but will not prevent their excretions going in which may or may not be obvious depending on the precipitation volume in the sample and sample not invalidated.

10:19:02 From Kulbir Banwait : ...or at least certain analytes of sample not invalidated.

10:22:35 From Amy Mager : Yes, FL00/FL03 issue has been resolved in the LIMS and database

10:28:00 From john offenberg : It appears that 'different' possibilities are available through in-person vs virtual site visits? have these differences been tabulated so that the group can evaluate the relative importance and trade-offs of the two approaches?

10:32:09 From Chris Worley : Richard, what frequency are you planning for virtual site visits (once/yr)?

10:35:23 From Richard Tanabe : Initially, we will send out to all sites that are not on the EEMS schedule for 2021. Depending on the response we'll reevaluate how frequent.

10:55:45 From Ryan McCammon : I'll be happy to help with "Data Completeness".

10:59:53 From Chris Worley : ECCC showed positive bias for Cl and specific conductance.

**11:15-11:30 Siting Criteria Workgroup (Tim Sharac)**

- Only 24% of sites meeting all siting criteria in the 2019 EEMS Audit Report. Currently 23 siting criteria rules.
- Debris counts impact proportion of QR codes; plant, dirt, and animal debris are the most impactful types.
- Siting criteria violations span all QR “C” percentiles bins, suggesting that some common siting criteria violations may not be negatively impacting data completeness. Useful to examine % QR “C” percentiles to target sites in need of additional support. Should consider changing NTN collector 30 degrees to a tree as a rule instead of as guidance. The high proportion of siting criteria failures (76%) does not reflect the average low % QR “C” coded samples (14%)

**11:45 AM Data Quality Objectives Summit and Workgroup (Camille Danielson/Martin Shafer)**

- MQO/DQIs. Have had numerous DQO workgroup meetings. Trends, data completeness, deposition, network uncertainties, parse network uncertainties. Will reach out to new proposed members of workgroups soon. Ryan McCammon volunteered to be part of data completeness group.

**11:55 AM USGS External QA Report (Greg Wetherbee)**

- Greg sent out the USGS External QA report. Everything looks ok. Conclusion: not approved by USGS, so not for distribution. MDN seeing 1 ng/L negative bias. Max MDN contamination of 0.09 ng/L.
- Data for sensor sensitivity has been part of my USGS External QA Reports forever. You can learn about how these different sensors affect NADP data in: https://www.sciencedirect.com/science/article/pii/S0269749116326999?casa_token=ZMR0zG3MFKMAAAAA:w_4gNx0F2TWd_BgAya9NNkpuOkasA07hH7zucScQxwggD-FlUIUTuzFSFPYozbis8TV2UGm-Z8w