

Network Operations Subcommittee (NOS) Meeting Minutes
2018 NADP Fall Meeting
Albany, NY
November 6th, 2018

NOS Chair: David Schmeltz (USEPA)

NOS Vice-Chair: Richard Tanabe (Environment & Climate Change Canada/WSLH)

NOS Secretary: Melissa Puchalski (USEPA)

1. **Approval of NOS minutes from Spring 2018 meeting (Milwaukee, WI)** – Richard Tanabe
 - **Motion:** Greg Wetherbee; second: Mark Olson. NOS minutes from Spring 2018 were unanimously approved.

2. **NADP's Quality Assurance Advisory Group (QAAG) Fall 2018 Report** – Greg Wetherbee
 - QAAG held their bi-annual conference call on October 19th, 2018. Greg noted that anyone can participate in QAAG. Highlights included:
 - i. Site surveys are on schedule
 - ii. NED/Site liaison activities are on track
 - iii. Training videos and SOPs have been edited and are ready to be posted to the website
 - iv. New Androids have been purchased to replace aging PDAs
 - v. MDN: HAL documents need approval. HAL 2017 QA report has been reviewed; HAL is updating QAP.
 - vi. AMNet: The Tekran 2537 A, B, X comparison white paper, being led by Mark Olson and Tim Sharac, is almost finished. Mark has finished the Data Management Manual and the Guidelines for Evaluation/Approval of Equipment needs to be reviewed for AMNet. Mark is still working on the SOP for site surveys.
 - Camille Danielson then provided an update on AMoN quality assurance changes that were discussed on the QAAG call including:
 - w-CAL is reviewing historical AMoN data to update QA/QC processes. They are looking for ways to improve the accuracy of the data for the end users.
 - w-CAL is updating the MDL calculations for AMoN (network and laboratory). w-CAL will use "d" flag to reflect annual MDLs.
 - w-CAL will flag travel blanks with a "t" flag and a B code when the blanks are > 0.02 mg L⁻¹ NH₄⁺
 - w-CAL is changing AMoN extended analysis ("y" flag) from 16 to 21 days which includes shipping and analysis time.
 - w-CAL is looking at way to improve shipping to reduce breakage and costs
 - Camille is drafting the laboratory's Quality Assurance Plan (QAP)
 - w-CAL proposed that the Program Office should censor all MDN and AMoN "C" coded data following the procedures that NTN and AIRMoN have adopted. They noted that users can still request "C" coded data.

- Greg noted that he does not like this proposal and the process for “C” coding NTN and AIRMoN data should also be reviewed. Are valid data being flagged as invalid (“C” coded) during the validation procedure?
- Kristi Morris suggested that NOS get Bret Schichtel’s input on “C” coded data.
- Greg noted that the laboratory Readiness Verification Report and results were discussed on the QAAG call and will be discussed in a separate presentation.
- Camille and Martin Shafer are now the official co-chairs of QAAG.

3. **Ammonia Monitoring Network (AMoN) Update** – Melissa Puchalski

- There are 96 active sites and no sites lost in 2018
- Highest concentration was Logan UT (UT01)
- Melissa showed annual trends increasing at three sites in different source regions: Logan (UT01); Detroit (MI96); and Connecticut Hill (NY67). These trends are representative of most sites in the network.
- Melissa provided an update on historical QA procedures and goals moving forward including:
 - Requesting that w-CAL continues to monitor blanks in the lab including exposed room and hood blanks
 - Triplicates have and should continue to be deployed at 5% of the sites each sample period. Precision in 2017 was 3.23%, calculated as coefficient of variation.
 - Uncertainty should be calculated using previous 3-years of triplicates (2σ) for quartile ranges. Uncertainty values should be added to the database.
 - There was a small increase in travel blank concentrations in 2017 (incomplete record). Limit of detection (LOD) should be calculated and used to flag ambient data below LOD.
- Melissa provided an update on the reduced nitrogen (NH_x) study supported by EPA’s Office of Air Quality Planning and Standards (OAQPS) with participation from the Office of Research and Development (ORD) and the Office of Air Programs (OAP) through CASTNET.
 - The goal of this study was to determine if acid-impregnated filters could be used in existing networks (Chemical Speciation Network and IMPROVE) to measure NH_x .
 - Acid-impregnated filters were deployed in Gainesville, FL and Duke Forest, NC in CSN and IMPROVE samplers co-located with URG denuder/filter packs, CASTNET and AMoN
 - URG denuder/filter pack results compared well with AMoN
 - Data are being presented in a final summary report with recommendations to OAQPS
- Melissa provided an update on the AMoN site characterization study designed to build a bi-directional NH_3 flux model for the 2-week integrated measurements
 - Field sampling is complete and laboratory results are being processed

- Second phase is to build a flux model using results from field campaign and literature/existing data sets to test sensitivity of the model to different measured parameters
- Preliminary results showed variability in air-surface compensation point between AMoN pilot sites and within site variability between vegetation types.

4. Atmospheric Mercury Network (AMNet) Update – Mark Olson

- There are currently 18 sites participating in the network which is the fewest number of sites in the history of the network.
 - Alert, Nunavut is not included in the count as they submit data but are not officially part of the network.
 - The site at Denali National Park (AK03) is closing soon but now there are new GEM sites joining: Cass Lake (MN06) and Indiana Dunes (IN34)
 - The Presque Isle (ME97) and Stillwell (OK99) sites still need operators
- There is NADP-owned instrumentation at Bondville, IL (Speciation), Clifty Falls, IN (Speciation), Leach Lake, MN (GEM), Boston, MA (GEM) and Indiana Dunes, IN (GEM will turn into Speciation). The PO has AMNet equipment available for sites interested or in need of equipment.
- Mark made 12 site visits in 2017 and performed one installation. Mark will visit Horicon, WI soon and will invite WSLH staff for training on equipment and audits. There is a need to expand knowledge across the program.
 - There is a UW PhD student assisting Mark with AMNet data and WSLH is working on identifying an AMNet site liaison back-up. Currently Richard is acting as the AMNet backup.
- The 2017 data is available on the website and the password has been removed.
- Mark provided an update on the status of AMNet documentation
 - The 2017 QA plan is ready for review
 - The AMNet Data Management Manual has been updated to include QR codes, but will need the Tekran 2357X updates
 - The Evaluation of AMNet Equipment is ready for review
 - The AMNet Operators Manual has been updated with 2537X and is ready for review
- There was a workshop in September 2018 in Manila on the Asia Pacific Mercury Monitoring Network.
- Japan has supplied manual GEM systems to 8 countries. Japan will conduct the analysis of the samples.
 - Greg suggested that the Japanese laboratory participate in the USGS interlaboratory comparison program for Hg. Mark will talk to the laboratory about participating.
- Tekran and the University of Toronto have designed Hg passive samplers that are being tested.

5. NADP Site Liaison Report – Richard Tanabe

- The toll free 800 number (800-952-7353) is now forwarded to a dedicated cell phone so there should be fewer missed calls. Richard noted that he received two calls today and last Tuesday he only received one call. There have been very few issues in the field.
- Richard did note that the number of calls peaked in June 2018 during the transition from the University of Illinois to WSLH, but the calls have been declining with a small increase in October due to summer help leaving parks, etc.
 - Calls are sorted based on issues: Precipitation related issues (42%) calls related to shipping, data download, etc.; AMoN issues (14%) including breakage, pilot for laboratory comparison; NTN related calls (41%); and AIRMoN (1%)
- WSLH trouble ticket system generates tickets for missing precipitation data as samples are received. Quicker responses and data recovery by assisting operators with their equipment or data download issues.
- There are several issues with the current data download options including equipment no longer being supported. The goal is to discontinue use of PDAs in the network.
 - An Android pilot project is underway. The PO purchased 11 Samsung J3 Android phones without SIM cards. The phones require Bluetooth and have Campbell LoggerLink app for transferring data.
 - They selected sites for testing that have had issues with data downloads but submit reliable data.
 - The feedback from operators has been positive. The PO is continuing to tweak settings.
 - The goal is to get up to 42% of sites using the Androids for transferring data. The PO purchased another 100 Android devices.
- Training CAL staff on all field equipment and sample procedures has been a priority. The PO brought field sampling equipment to the laboratory for a demonstration and training.
 - Mark Olson will also provide PO and w-CAL staff with training at Devil's Lake (WI31).
 - Richard has completed 9 training videos (with help from his daughter).
- The PO is developing an operator/site support section on the website with a tab for each network.
- A new numbering system is being developed for the SOPs so they easier to find and track.
- The PO has purchased three ETI NOAH IV raingages and five outer shells so they can implement an ETI repair/loaner program for sites which are experiencing load cell issues and optical sensor failures. The PO will try to repair equipment in-house.
- The PO purchased Ott Pluvio 2L's to upgrade the remaining Belfort sites with electronic gages
- The PO is testing options for telemetry:
 - A wifi option with a Campbell CR3000 that would allow Android and iPhones to download data via logger link app
 - A WiSnap RS-232 serial adapter is being tested

- The PO is working on data collection improvements. They purchased two CR1000KD keypads to resolve incorrect site ids and data logger time issues at sites
- The PO purchased two field laptops from WSLH IT department to send to operators for recovering missing data and loading data logger programs when required.
- The PO is looking for options for another collector for testing as there is only one option currently approved. Mark Nilles asked if they had considered Belfort? It is unclear if it was approved or approved for testing. Testing of the Belfort was performed at Bondville.
- The PO has asked the UW College of Engineering to develop/design a prototype of an event-based precipitation sampler. There are three students working on the project. The prototype will be completed by April and presented by the students at the Spring meeting.
- Greg is collecting old equipment after sites shutdown. There is potential to ship recovered equipment to sites that need updated equipment.

6. FY2019 USGS Precipitation Quality Assurance Project – Greg Wetherbee

- Greg noted that because of all of the work during the transition, he only supported the core QA projects excluding the field audit and system blank programs.
 - The monthly NTN interlaboratory comparison program included 11 labs. There was a brief discussion about including Prairie Research Institute (U. of Illinois).
 - The monthly MDN interlaboratory comparison program dropped to quarterly submittals in 2018. There were 5 labs participating. In 2019, the goal will be to include East Asia labs.
 - Greg did not run the co-located sampler program for in 2018 but will resume in 2020.
- Greg provided an update on the Denver NUANC research sites
 - CO13 will begin at Colorado State University as new NTN site this month with the possibility of one additional site in east Fort Collins, CO. This would bracket eastern and western Fort Collins to pick up the urban signal and agricultural impacts.
 - Greg might move the CO87 site to Aurora, CO.
- Greg provided an update on the QA Reports and working papers:
 - He produced the biannual USGS SIR 2015-2016 Report.
 - He is the lead author on a paper in the TDEP STOTEN Special Issue on Urban deposition.
 - He is an author on Nitrogen isotopes from urban samples.
 - His study on Plastic in rain will be presented at the NWQM conference.
 - He is also working on incorporating a Sutron data logger/GOES transmitter and soil moisture/temp – real time at monitoring sites using existing infrastructure (NADP sites).
- Next Greg will look at “C” coded data (see QAAG Report) and focus on modernizing the USGS QA website.
- Potential project in Rocky Mountain National Park looking at plastics in precipitation.

- Marty Risch sent a letter for Greg to read. This is included as Attachment A.

7. Long-Term Sample Archive – Martin Shafer

- Martin presented a sample strategy for the long-term archive records for NTN, AIRMoN and AMoN.
- NTN proposal for long-term archive
 - Most of the archive is still at being held at the University of Illinois (i-CAL). i-CAL held samples for 5-years from all sites (except certain sites).
 - w-CAL plans to drive to pick up archive samples (60,000 samples) with a refrigerated truck.
 - Proposal presented by w-CAL is to continue to keep 5-years of samples, but keep samples frozen. Existing archive samples from i-CAL archive will remain refrigerated.
 - Martin noted that freezing the samples will improve sample viability for emerging parameters and certain traditional analytes. Freezing the samples will not harm NADP analytes.
 - Archived samples will be offered to the community on their 6th birthday. Three months past the 6th birthday samples will be discarded.
- Proposal for NTN forever sites
 - There are currently three long-term forever sites (NH02, NE15 and IL11). w-CAL proposed to add WIXX.
 - The long-term forever samples are frozen and will remain frozen.
 - w-CAL will have a structured plan for keeping long-term random sample archive. i-CAL kept 1:100 samples. w-CAL will follow these criteria:
 - a. Fixed sites from 5 geographic regions of the country
 - b. Two sites from each geographic region
 - c. Monthly samples from each of the ten sites
 - d. Total of 120 samples per year
 - And selected sites based on these criteria:
 - a. Sites with a long history with the program
 - b. Stable funding likely into the future
 - c. Well-operated and maintained per EEMS site audit results
 - d. Comply with large margins all siting criteria
 - e. Co-located with other networks if possible
- w-CAL presented their proposal for the AIRMoN long-term archive
 - i-CAL kept all AIRMoN samples refrigerated for 2-years.
 - w-Cal proposes to keep all AIRMoN samples frozen for 3-years.
 - Archived samples will be offered to community on 4th year and then discarded.
- W-CAL presented their proposal for the AMoN long-term archive
 - i-CAL kept all AMoN samples from all sites frozen for 2-years.
 - w-CAL will keep all AMoN samples from all sites for 3-years.
- Martin noted that he does not believe that there will be any impact to samples if they are frozen versus refrigerated. w-CAL will split 150 samples into frozen and refrigerated

archived samples. They will analyze in 1-year increments for 5-years to compare frozen and refrigerated samples.

- **Motion:** Approve the plan as outlined above (as presented). Moved: Greg Wetherbee; Second: Mark Nilles. Motion carried.

8. **NOS Secretary** – Richard Tanabe

- **Motion:** Richard nominated Winston Luke as incoming NOS secretary. There was a second by Eric Hebert. Motion passed.

9. Motion to adjourn meeting by Richard Tanabe; Second: Greg Wetherbee. Meeting adjourned.

Attachment A Tribute to NADP from Marty Risch

Dear NADP Family,

Happy 40th birthday! It was a privilege and a pleasure to be part of this long-lived and highly successful organization for so many years. Life goes on and many of us in this family have scattered like autumn leaves in the wind. But we shall always remember our friendships and accomplishments together. What better time than a birthday to celebrate these good feelings? In searching for a way to express birthday congratulations, I turn to lyrics from songs of the legendary rock group, Low pH.

(to the tune of *Smoke on the Water* by Deep Purple)

“It started many years ago when pollution filled the air.
The lakes were acid. The fish were dead. It seemed like no one cared.
Scientists said the problem was coming from the sky.
Just give us some funding and we will find out why.
And we will sample the water that’s falling from the sky.
Sample the water.”

“Now we’ve been at it (40) years and some of us turned gray.
Some have left us. Some have retired. And some just rode away.
Now you young bloods, pick up the torch so our work won’t be in vain.
It could take another 40 years of sampling the rain.
Sample the water that’s falling from the sky. Sample the water.”

(to the tune of *Who’ll Stop the Rain* by Credence)

“Long as I remember, the rain’s been coming down.
Clouds with mercury falling deposits on the ground.
Emissions from the smokestacks drift across the plain.
And I wonder, still I wonder “What’s in the rain?”

I’ve been catching every drizzle and downpour
With micrograms so tiny, they’re easy to ignore.
Mercury keeps on falling and kills cells in my brain.
And I wonder, still I wonder “What’s in the rain?”

And finally, (to the tune of *Eleanor Rigby* by the Beatles)

“Oh, we are NADP people. Oh, we are NADP people.
NADP people, where do they all come from?
NADP people—it’s where we all belong.”

I raise a glass and offer a toast to your continued successes.
Your friend,
Marty Risch