

# Joint Subcommittee Meeting Minutes

2019 NADP Meeting

Boulder, CO  
November 5, 2019

Prepared by: Melissa Puchalski (U.S. EPA; NOS Vice-Chair)

## Welcome and logistics

- Meeting commenced at 8:31 MST with introductions
- Richard Tanabe, NOS Chair, requested a motion to approve the Spring Joint 2019 minutes. Greg Wetherbee moved, Rich Grant second. **Minutes were approved.**

## State of the NADP (Mike Olson, NADP Program Coordinator)

- The 2020 calendar is complete and ready for distribution.
- The 2018 Annual Summary is also complete and ready for distribution.
  - EOS should provide input in the future.
- NADP local outreach/interaction has included:
  - Wisconsin Garden Federation
  - Dane County Environmental Planning
  - Trout Unlimited of Wisconsin
  - UW Arboretum
  - Water@ UW – guest speakers talk about related issues. Interacting with this group may lead to new sites. Mike encouraged other participants at universities to do outreach to similar groups.
- NADP National & International outreach has included:
  - NEON & IMPROVE Networks
  - EPA Region 5 Tribal Environmental Planning meeting. Tribes did not know about NADP.
  - European Aerosol Conference (Gothenburg, Sweden)
  - 14<sup>th</sup> International Conference on Mercury as a Global Pollutant (ICMGP) (Krakow, Poland)
  - Elsevier Energy Transformation & the Environmental Workshop (Qingdao, China)
  - U.S. State Department International opportunities being led by Jamie Schauer
  - AGU fall meeting – NADP is an invited speaker. They will present an overview of the program and PFAS capabilities (Martin)
- The NADP Foundation was approved at the Spring 2019 meeting. ([Website](#)) The foundation is being managed by UW Foundation. Jamie will solicit input from Executive Committee if funds are donated, but he will make decisions on how the funding will ultimately be spent.
  - EOS subcommittee will be tasked with coordinating outreach and promotion of the foundation
  - The PO and NADP PI will report on the state of the foundation at the Executive and Budget Committee Meetings
- At the Spring 2019 Meeting, the Executive Committee approved the policy to evaluate and approve special studies and archive sample requests. The policy was formalized to ensure equality.

- *Guide for Sample Archive Request Evaluation and Approval (Internal)*
  - Request must meet NADP mission, be scientifically sound, and feasible to implement
  - Executive committee has the final authority to decide disposition
  - PO and CAL will work with requestors to get requests approved
- *Disposition of NADP/NTN, NADP/AMoN, and NADP/AIRMoN Archival and Active Samples memo (External guidance)*
- *NADP Requested Sample Information Memo*
  - Memo describes samples that are available for requests
- *Request for National Atmospheric Deposition Program (NADP) Samples*
  - Request form for evaluation and tracking
  - There are typically 5-7 requests annually for archive samples. Most requests are for isotope analyses, with a limited number for toxins, metals and biological studies.
- The first Strategic Planning meeting was held during the Spring 2019 Meeting
  - Established a formal mechanism to develop an NADP Strategic Plan
  - Internal and external stakeholders participating to brainstorm key initiatives and strategies including:
    - Governance structure
    - Existing and new network evaluation
    - Program stakeholder identification, inclusion and expansion
    - Network technology advancement – making networks more valuable
    - NADP product improvements for current and future stakeholders
    - Internal and external research support and expansion – i.e. special studies
    - International engagement
    - Network stability, sustainability including map coverage and thinking about funding limitations
    - PO, CAL, HAL efficiency improvements
- NADP Mercury – MDN
  - During the budget meeting the PO was tasked with developing a plan to address MDN losses
    - Site losses mean poor coverage in the western US
    - There is a draft plan to prevent further contraction of MDN which includes engaging with new stakeholders including:
      - Ecological restoration organizations
      - Commercial and sport fishing groups
      - Municipalities, especially through engagement with the CityDep Science Committee
      - Hg TMDL impaired waterways: many agreements in place, but agencies don't have a way to monitor the level of Hg deposition to waterways
- Addition and Removal of NADP Data
  - Formal processes needed to address the removal of Br<sup>-</sup> data (completed 10/15)
  - Process needs to be approved by the Executive Committee (policy document is being developed)
    - Describes how to identify when actions need to be taken on NADP data
    - Describes approval process and responsible parties

- The PO is developing a detailed SOP describing how changes to data are implemented and the required documentation
- UW Arboretum Outreach monitoring site
  - Site includes NTN, MDN, AMoN (established 2/2019)
  - Arboretum staff continues to work on outreach materials and signage
  - The PO would like to use this site as an example to connect with other arboretums across the US
- Eagle Heights Super Site
  - Slow start because of bureaucracy and need for a MOU
  - Temporary sampling of black carbon (research project)
  - Additional collaboration interest from UW Department of Atmospheric & Oceanic Sciences – atmospheric emitted radiance interferometer (AERI)
- There have been several changes to network sites
  - Site Closures (AIRMoN) – Network is on hold so no event-based sampling but the PO is continuing to explore different technologies
    - NY67 (Ithaca); PA15 (Penn State); TN00 (Walker Branch Watershed); WV99 (Canaan Valley Institute)
  - Site Closures (AMNet)
    - WI07 (Horicon Marsh); MA22 (Boston Univ.); NS01 (Kejimikujik)
  - Site Closures (MDN)
    - PA42 (Leading Ridge); NC17 (Univ. Research Farm); AK98 (Kodiak); WA18 (Seattle/NOAA); PA13 (Allegheny Portage Railroad National Historic Site); PA00 (Arendtsville); PA90 (Hills Creek State Park); OK05 (Hugo); OK97 (Tuskahoma)
    - PA and tribes had difficulty with funding, but Mike is working tribes to assist with writing Hg monitoring into their workplans.
  - Site Closures (NTN)
    - PA90 (Hills Creek State Park); NC17 (Univ. Research Farm)
  - New Sites (AMoN)
    - WI06 (UW Arboretum); WI94 (Bakken's Pond); AB35 (Elk Island); WY92 (Grand Targhees)
  - New Sites (NTN)
    - AB34 (Stony Mountain); TN00 (Walker Bridge Watershed); WV99 (Canaan Valley Institute)
  - Sites Pending (AMNet)
    - Closing: IL11 (Bondville, 12/31/2019); IN21 (Indiana Dunes, 12/31/2019)
    - Opening: MA22 (Boston Univ., TBD)
  - Sites Pending (NTN)
    - Opening: MI98x (Sault Ste Marie Tribe, TBD); ABxx (Wapasu, TBD); WIxx (Eagle Heights, TBD)
  - Sites Pending (AMoN)
    - Opening: MDxx (TBD)
  - Sites Pending (MDN)
    - Opening: WIxx (Eagle Heights, TBD); PA13 (Allegheny Portage Railroad National Historic Site, 11/2019)

- Closing: WA03 (Makah National Fish Hatchery, 10/1/2019) – trying to find support through EPA Region 10 contacts
- Government shutdown (Dec. 22, 2018 – Jan. 25, 2019)
  - Site liaison informed operators of impacts and preventative measures
  - Data loss – 71% completeness for 2019 due to shutdown
  - Greg Wetherbee is leading an effort to minimize impacts in the future
    - Each federal agency has their own needs
    - PO can help facilitate, but agencies need to provide them with contacts, addresses, etc.
  - Nov 21 – potential lapse of funding again so make sure agencies have plans in place before current CR ends
- Publications - 2018
  - 208 publications that included NADP data
  - 14 PhD dissertations
  - 4 agency reports
  - 1 article in Science
  - TDEP Report – use this for outreach (twitter) going through EOS
- NADP Initiatives to improve and expand networks
  - CAL is actively investigating QA/QC improvements and efficiencies (i.e. bag sampling)
  - Standardizing AMNet data processing and expanding expertise amongst staff. Subscribers need to follow guidance
  - Improving shipping methods and exploring options to offer return labels (pilot ongoing)
  - Establishing an annual operator survey
    - Ensuring contact information is correct
    - Feedback from field to improve operations
    - Telemetry available?
  - Investigating suitability of NTN for PFAS sampling, developing a dry deposition Hg product – working through TDEP and MELD, and measuring black carbon in precipitation (collaborating with Univ. of North TX), aeroallergen collaborations with Univ. of Iowa

#### HAL Report 2019 (Mark Olson, PO and HAL Manager)

- Transition to WSLH
  - Move from Eurofins Frontier Global Sciences (EFGS) to WSLH occurred 6/1/2019. The Executive/Budget Committees approved the move for September 2019, but EFGS was moving so timeline was accelerated.
- MDN currently includes 87 sites with 9 sites shuttered in 2019
- Readiness Verification Program (HAL)
  - Mark will discuss the RVP in more detail at the Spring 2020 meeting and future initiatives to identify new partners for MDN
  - Martin, Amy, Richard and Mark made a site visit to EFGS Feb. 12-14, 2019
  - Collocation study began in March 2019 at WA18, WI06, WI31 using dual chimney NCON collectors
  - RVP was approved in April by QAAG
  - USGS provided proficiency testing samples and analyzed the results

- Equipment
  - WSLH had to procure all equipment from EFGS including \$25K for 400 coolers, 250 funnels, and 200 Thistle tubes.
  - WSLH found a local glass blower to make extra funnels and thistle tubes (\$12K for 144 funnels and 200 Thistle tubes).
  - WSLH now has 400+ complete site sets
  - HAL purchased new analytical equipment including a Tekran 2600 (EPA method 1631), Tekran 2700 (EPA method 1630) and Nippon MA300 (EPA method 7473 for litterfall, which WSLH will take over next analysis period (fall 2020)).
- Facilities
  - Shipping/receiving and cleaning at Henry Mall, but under renovations
  - Analytical laboratory is located at Ag Drive
    - 3000 sq ft trace metal clean room
      - Anteroom (Tyvek) and controlled T/RH scale room
      - Acid cleaning room
      - Analytical room with 4 ICPMS
      - Hg Room
- Quality Assurance
  - PETG bottle blanks by lot (HgT and MeHg)
    - Currently using average weight for bottle tare which was adopted from EFGS
  - Sample train blanks (weekly)
  - Acid bath and crock concentrations (weekly)
  - DIW and preservative acid blanks
- Changes from EFGS to WSLH
  - Using boxes for shipping coolers has led to significant savings
  - Labels include acid warning and printed bottle ID
  - One “800 number” for site liaison for all networks
  - WSLH will evaluate acid volume concentration
  - WSLH will evaluate evaporation from PETG bottles
  - WSLH will perform collocated sampling and compare results to established field DQOs
  - WSLH will evaluate minimum sample volumes and variability
    - Bottle tare weight variability
    - Funnel catch variability
- Data delivery has lagged because WSLH incorporated MDN into their LIMS system
- MDN data review now follows system for NTN and thus processed more efficiently
  - Precipitation data are being processed in a more efficient manner
  - Direct comparison for co-located (NTN/MDN) sites
  - Developing and testing data review steps sequentially
  - Working towards 60-90 day turnaround time
- Reports
  - 2018 EFGS will produce the QA report. *Update from 4/15/2020: EFGS will not be producing the 2018 QA Report*
  - 2019 is a split analytical year so both labs will produce the QA report. *Update from 4/15/2020: EFGS will not be assisting with the 2019 QA report*

- New Staff Roles
  - Mark Olson – HAL manager (PO/HAL)
  - Richard Tanabe – Site Support (PO/CAL/HAL)
  - Camille and Martin - QA (PO/CAL/HAL)
  - Christa Dahman – Lab manager (HAL)
  - Amy Mager and others – Receiving and data processing (CAL/HAL)
  - Bob and Casey – LIMS and data processing (CAL/HAL/PO)
  - Dana Grabowski – Data and precip review (PO/HAL)
  - Erin Pierce – Shipping and supply prep (CAL/HAL)
  - Mark gave kudos to staff and thanked EFGS, the QAAG and Greg Wetherbee for effort during the transition

### 2019 CAL Report (Chris Worley, CAL Lab Manager)

- CAL currently has 12 employees. Chris shared the organizational chart with staff roles.
  - Chris serves as the CAL lab manager. Amy, Camille and Martin will fill roles for CAL and HAL.
- Government shutdown impacted NTN sample completeness. There was a 14% drop in completeness from previous year in the winter. It is still unclear if the shutdown will impact the annual maps.
  - Shipping logistics – last minute calls to cancel shipments, intercept and change addresses. AMoN prepped samples couldn't be shipped to some sites.
  - Receiving was busy after government reopened
  - February data set took 2x's as long as normal to publish
  - Staff time consumed with meetings trying to address logistics
- CAL continues to complete SOPs. Six more finished since the Spring meeting but still work to do
- Occurrence management tracking done with software package. Occurrence is an incident that occurs outside normal process
  - Information is logged in system
  - Mis-scanned samples (example) = Amy corrected system and no mis-scans for 2 weeks
- Samples received June 1, 2018 – June 1, 2019
  - NTN: 12,785
  - AMoN: 2,576
  - AIRMoN: 624 (network on hold)
  - Turnaround time for samples received to upload into LIMS: 15 days for NTN and 3 weeks for AMoN
  - Data turn-around from month of sample receipt to published – 120 days for NTN and AMoN – slowed because of HAL and government shutdown
- 261 NTN sites and 107 AMoN sites currently operating
- CAL is using Freezer Pro software to track archived samples to easily retrieve archived samples
  - 5-year archive samples obtained from iCAL and have been logged (60,000+ samples)
  - WCAL has archived 15,000+ samples since June 2018
  - Long-term record from iCAL has been organized and archived
- CAL priorities
  - Camille is performing a systems audit in November and December 2019

- Focus on improving efficiencies in the lab
- Extending calibration range to lower time spent on dilutions
- Reagent holding times
- New tools to improve process efficiency – 2.5 hours saved in AMoN washing process
- Four NADP groups applied for innovation awards which support labs ability to improve WSLH operations, systems, efficiencies and save resources.
- CAL is continuing to cross train all chemists – rotating for 3<sup>rd</sup> time in March
  - There is an ongoing assessment of chemist capabilities, and rotation provides outside perspective and back-up capabilities
- Monthly management meetings held to keep cohesion among lab and PO
- Many CAL staff are also involved in non-NADP WSLH committees
- Bag roll out update
  - Delayed roll-out because losing NH<sub>4</sub><sup>+</sup> using FMDL 1904 solution after 16-hour exposure from unfiltered samples. Continuing to test bags and hope to roll out soon.
  - Will discuss in more detail in NOS this afternoon

#### QAAG Update (Camille Danielson, QAAG Co-chair)

- The QAAG call held on Oct. 30<sup>th</sup> 2019.
  - There are 17 members, but 50% are CAL/HAL/PO so they are looking for outside participation
- Independent site surveys (EEMS) are on track
- CAL QA Plan was approved electronically this summer
  - They will be incorporating the HAL in early 2020 into one QAP
- Camille will perform internal system audits this winter
- HAL lab validation report was presented, but not finalized. QAAG will electronically vote to approve the report next month.
- Minimum sample volume measured for total Hg (1.5 mL is too low)
- NTN bag sampling has been delayed until the spring when more data will be presented.
- DMAG and Data updates
  - An official NADP procedure is being developed for database editing and data removal. The PO has started producing occurrence reports and documenting changes for current data removals.
  - WSLH is updating their LIMS to handle the HAL laboratory analyses
  - Coding and error flagging is being addressed as part of a future coding assessment to provide consistency across the networks.
- AMoN site shelter audit checklist will be sent starting in Spring 2020
  - The survey/checklist was conducted once in 2017
  - Operators receive checklist on site conditions and nearby sources and a request for photos of shelter annually
  - The PO will send the checklist to operators annually
- AMoN acid-matching standards correction. CAL found that there is a small bias if they do not acid match (was not done by iCAL) so they will continue to acid match.
- AMoN anti-static bag study – approved by QAAG as a backup shipping method
  - Pilot project using glass jar and bags included travel blanks

- Bags were the same or better for AMoN blanks
  - No longer dealing with sample breakage so not switching yet
- AMoN moving from triplicates to duplicates. QAAG approved to switch Jan. 1, 2020. This will help offset costs and deal with increasing number of AMoN sites.
- NTN low volume filtration study
  - Approved WI/WD process and change to sample processing will occur Jan. 1, 2020
    - Syringe filter was the same or better than large filter
    - Low volume will be filtered so all analytes can be measured
- CAL/HAL/PO external audit needed – need volunteers
  - Discuss splitting audit into individual lab audits or all together (NOS discussion)
  - Litterfall QA needed
- Greg Wetherbee had several publications related to QA
  - Data for the USGS Precipitation Chemistry Quality Assurance (PCQA) Project for the National Atmospheric Deposition Program (NADP), Sciencebase Data release
  - USGS Precipitation Chemistry QA Project Data (2017-2018), Sciencebase Data release (in review)
  - External QA Project Report for the NADP/NTN and MDN 2017-2018, USGS report (in review)
- Historical precip sensor data access should be made publicly available. Greg will present dataset to QAAG.
- Formal approval of PTGE bottle evaluation study occurred but data access should be publicly available. QAAG will summarize data and publish.
- CAL/HAL QA
  - Many QC samples are being processed by the laboratory
    - Supply testing including buckets, bags, cores, chemicals
      - Used lids have highest rate of supply QC failures
    - Proficiency testing
      - HAL – USGS, ECCC
      - CAL – USGS, ECCC, WMO
  - Annual review of capabilities and documents
  - AMoN QC
    - No exceedances of preparation blanks, hood blanks, room blanks or travel blanks in 2019
      - Very low concentrations for preparation blanks in late 2019
    - Limited exceedances – core, jar, and water blanks
  - MDN total Hg bottle blanks
    - One exceedance from a 1L bottle from a single lot
    - Sample train blanks resulted in some exceedances but none after renewed acid vats. EFGS was not performing sample train blanks.
- Discussion - Tom Butler asked about analyte losses using bags since AIRMoN has been using bags
  - How significant is loss the lab is seeing? Camille noted that it is fairly insignificant depending on sample volume. Bags are generally cleaner than buckets so you can get a



bias. Buckets have shown nitrogen losses. There is additional testing needed to quantify the losses.

- AIRMoN samples are not in the bags as long and then the sample is kept cold which definitely has an impact on the sample.
- NADP will resume testing between bags and buckets at WIO6 in the spring and report back.

Overview of Agendas (see individual agendas and minutes)

- CLAD
- AMSC
- NOS
- EOS

Science and subcommittee report outs (See individual subcommittee minutes)

- CLAD (Mike Bell)
- AMSC (Andy Johnson)
- NOS (Richard Tanabe)
- EOS (Chris Rogers and Catherine Collins)

TDEP Ag Workshop Recap (Greg Beachley, TDEP Co-Chair)

- *Connecting Stakeholder and Science Perspectives to Better Understand the Linkages Between Agriculture and Reactive Nitrogen Deposition* held on Monday in lieu of the TDEP Science Committee meeting
- Workshop objectives included:
  - Improving current understanding of the role of agriculture in reactive nitrogen deposition was identified as an overarching theme in the TDEP white paper
  - Greater collaboration and closer engagement between the science, policy making, and agricultural stakeholder communities to help advance the science of reactive N deposition
  - Gather input from stakeholders on knowledge gaps and research needs
  - Identify opportunities for greater stakeholder engagement through TDEP and NADP
  - Encourage new participation in TDEP
- Feedback on workshop
  - Reaction was overwhelmingly positive
  - Format with presentation and panels was well received
  - Positive comments on stakeholder sessions
  - Good to showcase the successful engagement between federal and state agencies, industry and commodity groups in Rocky Mtn. National Park nitrogen deposition reduction efforts
    - Can be framework for engaging with other stakeholders across US
- Products:
  - Summary report will be posted to NADP website – will involve follow up with panel members

- Agricultural stakeholder engagement plan for TDEP
  - Developed with stakeholder involvement
- Journal article geared toward communication with agricultural community
  - Framed by stakeholder presentations and panel discussions
  - Supported by scientific presentations and panel discussions of the state of the science and research needs
- Initial takeaways
- Session 1: Modeling & source apportionment of reactive nitrogen deposition
  - Key uncertainties included parameterizing the deposition velocities and emission inventories, and capturing episodic emission pulses
  - Need for more measurements at emission sources
  - More comprehensive measurements needed (gas + particles, higher time resolution particularly for NH<sub>3</sub>)
  - Data assimilation in models
  - More model comparisons
- Session 2: Emissions of reactive nitrogen deposition
  - Satellites will play a large role in spatial allocation and identification of emission sources
  - Need for more ground-based measurements but noted the sensitivity of producers to conducting those measurements
  - Activity and management data seen as key need for improving emissions from both CAFOs and crops
  - Need for engagement with local commodity groups to collect information
- Session 3: Spatial and Temporal Patterns of Nr deposition
  - Number of needed improvements for monitoring sites – prioritization depends on science questions/policy questions/location (super sites or hybrid networks).
  - Consider site locations with existing ecological measurements
  - Need for data fusion products (satellites, model/measurements)
- Session 4: Federal Stakeholders
  - There are opportunities to partner with tribal nations on monitoring efforts
  - Panel provided examples of agencies engaging with stakeholders on BMP research
  - Discussion of relationship of BMP costs on producers
- Session 5: Commodity Groups and State Agencies
  - Building partnerships with commodity groups will take time, but achievable if built on trust and communication
  - Commodity groups felt like they should be in conversation going forward
  - NADP and national perspectives are helpful

#### MELD (Colleen Flanagan-Pritz, MELD Co-Chair)

- First official meeting of the ad-hoc science committee on Mercury in the Environment and Links to Deposition (MELD)
  - 35 attendees including universities, LADCO, Tekran, Appalachian Mtn. Club, and federal agencies
- Identified core themes

- NADP supports three Hg related monitoring networks under NADP and this science committee provides a needed link between those networks (MDN, AMNet, Litterfall)
- Mission:
  - Improve our understanding of atmospherically derived Hg sources, pathways, processes and effects on the environment
  - Provide an ongoing forum for technical exchange of information on issues relevant to atmospheric Hg deposition research and monitoring efforts
- Justifications for a Hg Science Committee include:
  - Lacking a forum for the technical exchange of information between NADP's current Hg monitoring efforts
  - Adds ecological relevancy
  - Enhances the utility of the data served by NADP
  - Fills the need for ongoing collaboration within a broader Hg community
- More of a working meeting at Spring 2020 meeting in Madison
- Identified short term tasks (1-5 years)
- Goal is to develop a series of workplans that morph into working groups to address the following:
  - US Hg Assessment report (state of Hg in US)
  - Development of passive, low-tech network
  - Address Hg modeling and emission inventory needs
  - Coordinate with states and partners to put biotic data into a common database, and better link that data to deposition
  - Expansion of air concentration data beyond AMNet

#### Litterfall (Doug Burns, USGS)

- Transitioning the litterfall network to WSLH in 2020, but right now USGS (Troy, NY) is coordinating the program. The analysis will be done at the HAL (WSLH).
- Stakeholders met to discuss and implement transition.

#### Nomination of NADP Secretary (Doug Burns – for Tamara Blett)

- John Walker was nominated by an ad hoc selection committee. Tom Butler moved, Selma Isil second. **Motion approved.**

#### Spring Meeting (Melissa Puchalski, US EPA)

- Meeting will be held in Madison, WI at the Concourse Hotel. Dates: May 11-15<sup>th</sup> 2020.
- Agenda has been shifted to accommodate science and ad hoc committees

#### NADP 2020 (Greg Wetherbee, USGS)

- Knoxville, TN Nov. 2-6<sup>th</sup>, 2022 (Election Week! Vote early)
- Theme is: NADP in a Changing World
- University of TN conference center with Knoxville Hyatt attached to the conference center
- Field trip will be to Great Smoky Mountains National Park. Jim Renfro (NPS/ARS) has organized the whole day

- 50th anniversary of Clean Air Act and 30th anniversary of CAAA. Keynote speakers should be tied to CAAA. Potentially looking at Sen. Lamar Alexander from TN or MT Senator? Greg is looking for feedback on guest speakers.

#### Conclusion

- Motion to adjourn by Melissa Puchalski, second Mark Olson. Meeting ended.