Joint Meeting

Session I: Wednesday May 12, 2021

Minutes prepared by Ryan McCammon (NOS Vice-Chair/BLM)

Only one motion during both sessions:

MOTION from Doug Burns: "The transitional Hg litterfall network shall become an official network of the National Atmospheric Deposition Program (NADP). The publicly available data release will occur after approval by QAAG. Links will be provided on the NADP web site to previous data collected by earlier versions of this network." Dave S. seconded. Motion passed and moved to Executive Committee for further consideration.

Welcome Address by Dr. James Schauer, WSLH Director, NADP PI

- Thanked all who were involved with keeping NADP running during COVID-19.
- Looking forward to the future of NADP regarding collaboration.

State of the NADP (David Gay, NADP Coordinator)

- Program Office Report
    - Current Activities
        - PFAS project with EPA.
        - Eagle Height up and running.
        - Many archive requests.
        - TN/TP sampler.
        - Aeroallergen Project.
        - Changes to litterfall.
        - MDN evaporation study.
        - AMNet dry deposition estimates.
    - Network and Site News
        - For any given week (during COVID-19) only had 10-15 % of sites down.
        - Financially doing fine.
        - Tracking of expenses improving.
        - Saved approximately $45,000 on travel due to COVID-19.
        - NTN remains fairly stable since 2003.
        - Nearly all sites have converted to bag samplers.
        - New idea: Total N and Total P sampler, "SnipIt". Testing has started. $65-85 for each sampler.
        - Number of MDN site closures is a concern. However, no sites have been lost during the last 8 months. Good news: four new sites coming soon. New MDN report will be generated and sent to site supervisors so they can understand the data and place into context in terms of how their money is being spent.

- National Mercury Network bill still in the works in Congress.
- AMoN continues to see a steady increase in sites (four sites since last Fall). Ongoing effort to recoat the cores as a cost-savings measure. SAES project, “Sources and Fate of Ammonia Across the Landscape”. AMoN could be big part of this study, however, the project needs funding first.
- AMNet continues to experience decline in the number of sites because it is expensive to operate a site. Currently working with EPA Region 5 to deploy a mobile monitoring trailer outfitted to meet AMNet specifications.
- Dry deposition estimates of GEM, GOM, and PBM using AMNet data. Goal is to model weekly dry deposition estimates that would line up with the MDN wet deposition measurements to get an estimation of total deposition.
- Some program highlights include the data reporting turnaround times of around 90 days for all of the networks. Also, a new NADP website is coming soon. Version 7 of the Governance Handbook is complete. QMP is complete as well. Ongoing efforts include recycling gloves, which would be a cost-savings as well as a trial run on recycling bags to help reduce costs. Social networking efforts continue to make great progress. Currently counting of 2020 publication highlights, could be well over 200. Site operator training continues to grow along with over the phone “interim site visits”.

Questions/Answers/Comments

10:25:03 From Douglas Burns: Would it be feasible to issue a similar type of report for NTN sites?

10:25:27 From Greg Wetherbee: They're planning/working on that!

10:25:57 From Vid Grande: Will the mercury report be available on the website?

10:26:05 From Donna Schwede: The MDN report is really great. Have you considered making a version of that for recently closed sites to help convince them how important their data is to bring back online?

10:31:06 From Greg Wetherbee: Good suggestions, Vid and Donna.

10:32:46 From Greg Wetherbee: Kudos to the CAL and HAL!

10:33:47 From Greg Wetherbee: Good housekeeping, EOS. Thank you!

10:35:35 From Theresa Crimmins: bravo on trying to cut down on plastic bag use!!!

10:35:55 From Selma Isil: Yes, agree!

10:39:19 From Greg Wetherbee: Could EEM&S do the remote site visits to get more sites at same or perhaps slightly increased cost?

11:00:10 From Eric Hebert: glad to help!

Covid-19 Program Impacts and Recovery (Richard Tanabe/Mark Olson)

- Percent of sites suspended due to COVID-19: NTN=14%, MDN=21% and AMoN=6%. Total=13%. Percent of missed samples: NTN=3%, MDN=7%, and AMoN=1%. Total=5%. Only site lost was SD18 (MDN).

Questions/Answers/Comments

Andy Johnson: Will there be credit for sites that were down? David Gay: We "park" sites that are shut down for a long period of time, and we stop charging them. This has not come up before, however we would (Richard Tanabe also agreed) consider a possible refund if the site supervisor reached out to us asking about a refund. Mark Olson: there was one site down for an extended period of time, and we did give them a refund. Greg Wetherbee: we could take this issue up during the July budget meeting.

Covid-19 Impacts Discussion - NADP Network Sponsors/Program Office

- EPA: ME04 status? Richard Tanabe: We haven't received any samples, however, the site will restart.
- USGS: Site operation has been a big issue. Two sites still need operators (COVID-19 is not helping that endeavor). Kudos to EEMS for a few site installations because of DOI travel restrictions. QA has been diminished due to not having personnel to process samples.
- NOAA: Travel restrictions still in place. Have delayed site installations. Hats off to EEMS as well.
- BLM: Travel restrictions still in place. Kudos to EEMS as well.
- Park Service: COVID-19 impacts to the Parks paper: https://www.sciencedirect.com/science/article/pii/S0006320721000902

Questions/Answers/Comments

None.

Covid-19 Impacts Discussion - CAPMoN, CASTNET, IMPROVE

- CAPMoN: Still under stay at home order. Limited access to building: two analytical lab staff to receive samples and one field staff for parts shipments. Travel restrictions have impacted site audits, and preventative maintenance. Depleting supply of spare instrumentation. CASTNET Egbert audit delayed in November. Delay in capital infrastructure projects like Bratt's Lake. Data has been impacted as well including sample degradation and delays in data reporting.
- IMPROVE: Faced all of the same issue the other agencies have mentioned. Only lost data from 27 out of 160 sites for only two months. Overall, in good shape.

- CASTNET: Currently operating normally. Minimal impacts. Only three sites didn't change filter packs for more than 21 days, will flag data as invalid during that time. Site calibrations/audits paused. CA sites missed their 2020 PE evaluations required for Ozone monitoring. Postal Service delays in shipping filter packs caused issues.

Questions/Answers/Comments

Regarding CAPMoN…Winston Luke: What about the backlog of sample analysis? Jason O'Brien: Checking into other ways of dealing with the backlog. Camille Danielson: Are you doing a study on the effects of storing samples? Jason O'Brien: Have a plan (being developed). Samples are unfiltered. Taking current samples and processing them first at different time intervals to gauge the effects of delayed analyses. Greg Wetherbee: What temperature are the samples stored? Jason O'Brien: 4 degrees Celsius. Greg Wetherbee: what about having Wood analyze the samples? Jason O'Brien: We will consider that. Chris Worley: WLSH can help with some of your samples. Bret Sch: Frozen samples seem to be quite stable for a month. Possible to freeze them? Jason O'Brien: Freezing samples risks puncturing the bags and we'd lose sample.

11:15:29 From Anne Marie Macdonald: It might be a great idea to do some splits or stored samples for comparison with the Wisconsin lab. That may help with the QA study.

11:15:32 From Kulbir Banwait: ECCC don't report Total Nitrogen in precipitation, most affected by not filtering or freezing.

Strategic Planning/MDN Network Viability Update (Greg Wetherbee/David Gay/Mark Olson)

- Executive Committee suggested prioritizing strategic initiatives that Jamie and David developed.
- Priority One: Sustainability of NADP Networks. Start now. Increase funding, implement cost-savings actions, and start new initiatives.
- Priority Two: Expansion of NADP participation, audience, and data users. Start now through 2023. Form new membership groups by engaging agencies, cities, and NGO's linked to the human heath community. Enhance public engagement at the Spring/Fall meetings through expanded outreach using many tools NADP already has.
- Priority Three: New networks and initiatives. Start now through 2022. PFAS, Total P&N, NTN Dry Deposition, and NAPNet/PollenSense (MOU).
- Priority Four: Develop strategies for international engagement and capacity building. Start now through 2022. Collaboration, capacity building, data integration, and funding support. Strategic partnerships with international and global monitoring initiatives. Develop NADP "brand" internationally through participation in global initiatives (e.g., GOS4M, WMO, LRTAP/HTAP). Invite new sites to the network, where feasible. Create an international advisory group to advise the Executive Committee on matters of international engagement.

- Priority Five: Research and Scientific Developments. Start now through the near future. Use existing networks, sample archives and the associated data for new and novel research. Develop new approaches and research areas to add value to NADP's infrastructure, including understanding emerging contaminants of concern, ecosystem impacts, increase data resolution, and new technologies. Key research needs are integral to long-term NADP success.
- Priority Six: New Products to Increase Scientific Relevance. Start now through 2022. Develop approaches to further inform policy on critical loads, mercury deposition, and climate change. Develop approaches for targeted outreach to policy and resource management communities.
- Priority Seven: Use New Technologies. Start now through 2023. Utilize new technologies and/or develop partnerships to better support networks and optimize interpretations and use of NADP data. Utilize new technologies for existing NADP products. Explore the network application of passive and low-cost active mercury samplers to address AMNet data gaps.
- Priority Eight: NADP Governance and Organizational Changes. Start now through 2022. Develop a more codified process to make decisions regarding the introductions and possible closure of new networks and analyses. Review the structure and management of Spring and Fall meetings to ensure stakeholder needs are met, and competition for time between operational and science committees is appropriate.
- MDN Network Viability Update
    - Holes in map in the West. Need five sites in the Western United States.
    - Long-term MDN samples. Mercury Carbon capture experiments (see NOS notes).
    - New Mercury Report. Intended for site supervisors.
    - Dry Deposition of Mercury Mod

Questions/Answers/Comments

Re: Strategic Planning … 12:34:07 From Linda Geiser: Should have pressed 'send' earlier! Exciting strategic plan. Its forward thinking and keeps the program at the forefront of new technologies, emerging pollutants, and engaged with a variety of partners. Agree we should encourage development of practical action items for the components and commitment to implementing them.

Re: MDN…Donna S.: Are you going to make available the driving parameters for the model? David Gay: We will provide assumptions and specific parameters. John Walker: Long-term goal is to provide dry deposition estimates using AMoN data that serve as flux estimates independent of CMAQ…work lags behind at the moment.

PFAS Update (Martin Schafer/Mark Olson)

- 2019-2020 PFAS Pilot Study.
    - Access the efficacy of the NADP infrastructure and current sample collections methods for PFAS studies.
    - Broaden the number of PFAS compounds.

    - Initiate a synoptic overview study of PFAS concentrations in precipitation across the US.
    - Improve the quality assurance documentation of PFAS precipitation studies.
    - Loss of PFAS during collection is minimal for compounds of carbon number <10 under current (and planned) NTN protocols.
    - Losses were observed for longer-chain (>10) PFAS compounds, but recoverable with a methanol rinse of the bucket.
    - Current NTN protocols are "clean" for a broad range of PFAS compounds.
    - Alternate handling/collection protocols can be implemented to address losses of longer-chain compounds (MeOH rinsing).
    - Precipitation (and air) are effective monitoring matrices for detection of trends (likely better than other environmental receptors (e.g., fish)).
    - WSLH-NADP PFAS Toolbox
        - Developed a standardized robust protocol (SOP) for PFAS wet-deposition measurements using the NADP-NTN infrastructure.
        - Incorporates optimized analytical methods.
        - Will support site-specific, state, regional, and national PFAS wet-deposition efforts.
        - Model (process) for other emerging contaminants.
    - Pilot Study: Key Findings.
        - From the 30 sites/37 samples for the Spring and Summer of 2019, levels of many PFAS compounds were low (1 ng/L), though the $\sum$ exceeded 4 ng/L at several sites.
        - Sites in the mid-Atlantic states generally had the greatest number of detectable PFAS specifies and the highest concentrations.
        - PFHxA, PFHpA, PFOA, and PFNA were each present in nearly 70% of all samples.
        - The carboxylic acid compounds were by far the most frequently detected and largest class contribution to the total targeted PFAS.
        - PFAS deposition fluxes: concentrations of 0.2 to 6.0 ng/L equate to a wet deposition PFAS flux of 0.7 to 21 ng/$m^{2/}$day (at an annual precipitation volume of 125 cm/year).
- Wisconsin PFAS Intensive 2020.
    - Used seven NADP-NTN Wisconsin sites for 14 weeks (April-July 2020).
    - Funding from WDNR while NADP and WSLH were partners.
    - Optimized PFAS sampling protocols with MeOH rinsing.
    - Comprehensive analytical protocols.
    - Found PFCA in 94% of samples.
    - PFAS flux at Devils Lake >40 ng/$m^{2/}$day during a particular day in May.
    - Concerning the Wisconsin Marinette sub-study 2020:
        - Major environmental contamination area.
        - Fluorotelomers are a major AFFF component.
        - Measured PFAS in 100% of the samples.

        - 6:2 FTSA mean concentration was the greatest of all PFAS measures (>0.7 ng/L).
- EPA-ORD PFAS in precipitations initiative Eastern US.
    - Data collected from four sites: ME96, NY98, NJ99, and NC30 (triplicates).
    - Using same SOP from the aforementioned studies.
    - Using a new method (screening method) to look at total Fluorine in environmental samples. If high amounts, then will analyze for targeted compounds.
- Ongoing PFAS field QA Projects.
    - Collector lid seal blank studies: Two rounds.
    - New Bag (VIN) blank and sorption studies. PFAS sites not using bags.
    - 3-day sampler blanks: No detection for 33 of 36 compounds.
    - Lid rinse blanks: No detection for 35 of 36 compounds.
    - Lid soak blanks: No detection for 32 of 36 compounds.
- PFAS Initiative in Development.
    - Establish parallel LC/MS/MS (Targeted PFAS analysis) capacity on UW-Madison campus (necessary instrumentation is in place).
    - Method development/validation of air (vapor and aerosol) methods for PFAS.
    - Human biomonitoring.

Questions/Answers/Comments

12:29:04 From Eric Uram : 6:2 FTSA is a common substitute for PFOA and PFOS - the industrial "safe" substitute for the known problem PFAS

12:34:35 From Douglas Burns: Is Martin's strategy to offer a fluorine analysis at a more affordable price than PFAS with an option of a full PFAS analysis if the fluorine concentration is greater than some threshold value that would justify a PFAS analysis?

12:40:16 From Jamie Schauer: Doug, you are correct but we also should to note that the targeted PFAS compounds that we measure may only make up a small fraction of the PFAS compounds in a sample. For this reason, understanding the Total Organic Fluorine (TOF) has value in itself. This approach parallels how we measure VOCs and particulate matter organic carbon. The TOF analysis is cheaper and can be done faster than the PFAS analysis.

CLAD Video - Quantifying Critical Loads to Ecosystem Components (Linda Geiser)

- Not ready for primetime viewing. A total of seven videos will be made. Plan to show one at the Fall meeting.

Questions/Answers/Comments

None.

NADP AMSC Pollen Study (Greg Wetherbee)

- Four different instruments collecting pollen operating at three different locations (and maybe at UNLV soon).
- Data will be compared to traditional pollen methods, and to each other.
- Will determine if the NADP/NTN network can be used to estimate pollen levels in the atmosphere.
- NAPNet proposal – NPN + NADP + Ameriflux + Phenocam + PollenSense = A Network of Networks.

Questions/Answers/Comments

13:06:46 From Linda Geiser: Greg, how much do the Pollen Sense instruments cost and how much do they cost to operate? Answer: $6,000. However, if large volume made, cost could be cut by one third.

13:08:51 From Na Zhang : Can this instrument analyze all kinds of pollens? Answer: Answer not provided.

Session II: Thursday May 13, 2021

Subcommittee Highlights

MELD (Rick Haeuber/Colleen Flanagan-Pritz)

- Mercury updates from the NADP PO.
- Conveyed and discussed the latest on Hg litterfall science and sampling protocols.
- Report out on the January 2021 Mercury Measurement Workshop.
- Updated the MELD community on Minamata Convention on Mercury-related activities, and discussed monitoring recommendations for air, biota, and modeling.
- Shared recent related work on mercury science.

TDEP/CityDep (Greg Beachley/Greg Wetherbee/Katie Benedict)

- Had a MOTION to approve CityDep as working group.
- Greg Wetherbee gave a presentation on urban deposition featuring the SPARROW model.
- EOS update on outreach.
- John Walker gave an update on the stakeholder program.
- Greg Z. gave an update on the USDA agricultural air taskforce.
- Rich Grant gave a presentation on the NCDC agricultural ammonia proposal.
- Announced the formation of a measurement and modeling workgroup.
- Two presentations on the Sands Deposition Project.
- Measurement Model Fusion update. Will complete 2020 modeling using CMAQ Version 5.3.
- Presentation on comparing deposition between CMAQ 5.0.2 and CMAQ 5.3.

- Amada Cole provided an update on the WMO Global Atmospheric Deposition effort.
- Presentation on "Assessment of deposition models from Air Quality Modelling Evaluation International Initiative (AQMEII)" (Paul Makar, ECCC)

CLAD (Jeff Herrick/Emmi Felker-Quinn)

- MOTION to form Working Group 6 was approved. The focus for WG-6 will be on ozone effects and ozone critical levels.
- CLAD seminar series on-going, will end in July. Presentations on the NADP website.
- Discussed how TDep changes (script conversion and CMAQ update) will affect critical loads application and development.
- CLAD members will meet with TDep Summer 2021.
- Working group updates were presented.

AMSC (Andy Johnson)

- Zoom meetings have helped to increase AMSC meeting attendance.
- Approved Fall meeting minutes.
- Aeroallergens are falling more into the climate and health arena as opposed to being its own special topic.
- Unanimously approved a MOTION: The Chair shall request at the Fall 2021 Executive Committee meeting that the AMSC be reauthorized to continue its work as a science committee. The AMSC will prepare and present the necessary documentation to support the request, which will include an updated work plan for the next four years and incorporated as part of its updated charges.
- The PollenSense video was presented.

NOS (Winston Luke)

- CAL/NTN/AMoN Update (Chris Worley/Amy Mager)
    - Status of bag sampling – Nearly fully rolled out. 98% of NTN sites have transitioned to bags, special studies, equipment testing sites, and PFAS sites have not yet. Touched on bag recycling as well.
    - Wet Total N/P Sampler – newest version will arrive at the SLH soon.
    - IL-11 Sample Archive is now at WSLH!
    - Great push by the WSLH to meet the 90-day data turnaround time to the website.
    - AMoN recoating studies – work continues to refine the phosphate coating of the cores, have tested various Radiello diffusive bodies.
- HAL/MDN/AMNet/Litterfall Update (Mark Olson/Doug Burns)
    - Increase in A coded MDN data after switching to PETG bottles.
    - HAL will take over the USGS system blank program in 2022 and will continue to study the field duplicates, spike experiment, ACM evaporation studies.
    - Studied MDN duplicates in a dual-chimney NCON collector with good results ($r^2 = 0.95$).

    - Acid study to determine sufficiency of the acid charge on large sample volumes – looks good.
    - Similarly got good results on the spike and blank Hg studies.
    - Discussed the proposed revised Litterfall sample processing to reduce cost and labor effort - plan is to composite all samples from a given collector and subsample 10% of the mass – this will be freeze dried, the remaining sample will be oven dried.
    - Also discussed potential changes to L/F (multiple seasons, expanding the type of material to collect and sample (lichens, bark, deadfall, etc).
    - Discussed a motion to approve the Hg litterfall network as an official NADP network but this was tabled and will be discussed here in Joint before presentation to Exec.
- Quality Assurance Update (Camille Danielson)
    - General Update – Network MDLs largely unchanged or slightly lower (in the case of NTN after the switch to bags.
    - Similarly, AMoN QC, travel blanks, jar blanks, etc. look good -travel blanks continue to trend lower.
    - NTN supply QC largely good – some Cl- exceedances on syringe filters were noted, some bucket lids failed for Ca and Cl-, but enhanced cleaning resolved this issue.
    - Discussed the entry of leaf area and weather conditions on the AMoN field form.
    - MOTION: Revised the AMoN field forms to eliminate Boxes 5 (leak cover data) and 6 (weather conditions during deployment) but no immediate changes to existing forms – will be phased out when new forms are printed.
    - Discussion to use mesh screen on the ETI gauges in a few locations (Florida) to keep frogs from jumping into the gage – effects on precipitation catch efficiency will be examined using existing data with and without the mesh.
    - In the interest of operator safety, passed a motion to allow 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.
- Equipment Testing (Mark Olson/Richard Tanabe/Bob Larson)
    - Compare duplicate NCON collectors with independent sensors – good agreement
    - However, agreement between the NCON and ACM collectors (grid sensor was poorer – ACM tended to miss low precip events.
    - Catch efficiency reported by the new KJJ collector could occasionally significantly lower than the NCON and ACM collector, but at other times performed well.
    - Conversely the NCON collector can capture precip in low rain events that are detected by the rain gages.
    - Comparison of NTN Chemistry to Site Historical Data for Determination of Sample Validity (Zac Najacht).
    - Outlined the SL coding score that takes into account reported analyte concentrations in a given sample and compares to historical data at that site

(exceed 90th percentile, exceed max, etc). Given enough variation in analyte concentrations from historical norms, the sample can be given a QR code of C (invalid).
    - ** 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).
        - Similar measures to adjust the length of the historical data record as a basis for invalidating samples at existing sites will be evaluated – not put into the motion.

- 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 and Bob have been talking with ETI manufacturer to address equipment failures.
    - Belforts: found 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.
    - 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 is 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.
    - Found numerous positive longitude values that need updating.
    - New news: replacing Belforts with OTT gages for NADP PO. Installing GOES data transmission USGS.
- 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%)
- 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 M. volunteered to be part of data completeness group.
- 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.

EOS (Catherine Collins/Chris Rogers)

- Governance Handbook changes:
    - Added approved (EC Fall 2019) EOS section changes.
    - Updated U of I to UW, added MELD and AMSC committees to the science committee section.
    - Moved/consolidated paragraphs from the Technical and Science committees regarding committee voting, motions, and minutes (new section is under A).
    - Added a requirement to post minutes within 60 days of meetings.
    - Deleted number of committees.
    - Modified all diagrams, inset text boxes to include EOS, MELD, and AMSC.
    - Fixed minor editorial comments.
- MOTION to approve the aforementioned changes and sent to EC for final approval.
- Social media updates showed types of posts created.
- Working on a draft NADP fact sheet.
- Working on educations learning modules (committee to meet and develop work plan).

- Creating a “Mercury Matters” brochure. Will have final version by Fall 2021 meeting.
- Developed an NADP Wikipedia page.
- Work on the new NADP website continues with the migration happening after the Fall 2021 meeting.
- Completed AMoN brochure and Foundation letter, both appear on the NADP webpage.
- Judged 19 papers/posters from the 2020 Fall Science Symposium.
- Added two additional meetings (Summer and Winter) to discuss education and outreach topics.

QAAG (Camille Danielson/Martin Schafer)

- Added Jason O’Brien to committee (acting head of CAPMoN).
- Site surveys are on track.
- Site support issues discussed include: AMoN meteorological conditions, AMoN leaf cover conditions, frog deterrent, and pesticide use for AMoN, MDN, or NTN.
- Tim Sharac provided an update on siting criteria.
- Presented an update on the DQO.
- New tool for lab staff: data review metrics reports in LIMS.
- A new code, “q” was added this past January for AMoN and NTN.
- Lab QA update: New MDL’s for AMoN and NTN, performing lid QC, and pH stirring were introduced on 5/3/2021 to help improve accuracy and precision of measurements.
- Information about the “q” notes code:
    - Qualifier “flag” (notes code) to indicate possible problem with an analyte result=minor QC issue=Quality rating of “B”.
    - Has been added to NTN and AMoN (MDN was built with a “q” note at WSLH.
    - Indicates analytical QC issue with leads to “B” (lacking this in NTN entirely – lab issue=QR C or no flagging).
    - The entire sample rated “B” – lacking way to flag individual analytes (have to look at notes to determine which analyte had the issue and detailed notes and codes for QR B samples are only on reports, not on website).

DMAG / NADP Website Update (Bob Larson)

- Labs meeting their 90-day targets.
- Working on integrating precipitation review and integrating NTN with digital precipitation data into LIMS.
- Going to conduct internal data workshop among PO and CAL/HAL personnel to address the design and select features that meet user’s needs.
- Discussed the new website. A work in progress.
- Working on data retrieval system.
- New website will not be able handle conference management features. Looking for alternates (cloud-based).

<u>Questions/Answers/Comments</u>

Re: CLAD…Greg Wetherbee: please comment on which ozone networks we should be contacting for engagement with CLAD and NADP more broadly. Answer: we will discuss that during the Collaborative Network Discussion on Friday.

Re: DMAG…Winston Luke: can we provide input to website features? Answer: we conducted a survey last Fall soliciting end user input for webpage design. Willing to take additional input.

CASTNET Update (Melissa Puchalski)

- New site: UMA009, WA Confederated Tribes of the Umatilla Indian Reservation.
    - Small footprint, ozone monitoring site install November 2020.
    - Includes AMoN.
    - Tribe is preparing to add MDN in 2021/2022.
- New Site: CAV436, NM Carlsbad Caverns National Park.
    - Ozone monitoring site installed March 2021.
    - Heavy oil/gas development.
- Research: Addressing the gaps in the total nitrogen budget.
    - Improving characterization of reduced nitrogen at IMPROVE and CSN monitoring sites.
    - AMoN Site Characterization Study.
    - Water Soluble Total Nitrogen Pilot Study.
- Research: National Park Service
    - Carlsbad Caverns 2019 special study prompted follow up study this summer in collaboration with EPA/ORD & EPA Region 6.
    - 2017 VOC study at 4 parks (Grand Canyon; Great Basin; Joshua Tree; and Carlsbad Caverns) published in Atmospheric Environment.
    - 2002-2020 Yellowstone Winter Use Report (?).
    - Designing and deploying a PM monitoring sensor array for fugitive dust emissions impacting Joshua Tree National Park, CA.
    - Understanding Long-Term Variations in Surface Ozone and its Impacts on Vegetation in the Greater Yellowstone area (likely funded by the Greater Yellowstone Coordinating Committee in collaboration with SUNY ESF).
    - Smoke monitoring pilot study.
    - Reactive nitrogen deposition measurements in RMNP during COVID-19.
    - Organic nitrogen measurements (Amy Sullivan).
- Research: Publications and Outreach
    - Modernization of the TDEP MMF scripts
        - Code is now available in ArcPy and python because AML is no longer supported.
        - Better documentation and ability to share and update code.
        - Publication coming.
    - Coordination of Special Issue in Atmospheric Environment: The 30th Anniversary of the Clean Air Act Amendments of 1990
        - Highlighting trends and environmental results from CAAA.

        - 11 papers published.
    - EPA/ORD and Region 7 deployed a PANDORA spectrometer at Konza Prairie to measure total column concentrations during agricultural burns in the Flint Hills, KS.
        - May deploy 1+ PANDORAs to inform researchers on elevated ozone concentrations.
        - Data will be published to the pandonia global network website.
- Challenges
    - COVID-19 global pandemic
        - Wood laboratory continued operating.
        - Site operators continued to visit sites every Tuesday.
            - Minimal impact on data and completeness.
        - Calibrations were delayed and rescheduled to comply with travel restrictions.
    - Storm damage & Wildfires
        - Duke Forest, NC (DUK008) flux tower damaged the last week of 2020. Instruments are being re-installed now.
        - Cherokee Nation, OK (CHE185) Meteorological sensors were damaged due to high winds/tornado in Spring 2020.
        - Centennial, WY (CNT169/WY95) Equipment was removed due to the threat of Mullen fire in October 2020. It was reinstalled about a week later.
        - Rocky Mountain NP, CO (ROM206/ROM406) East Troublesome fire burned almost 200,000 acres within the park. The evacuation of Estes Park left the co-located sites at ROM vulnerable in October 2020.
        - Sequoia & Kings Canyon National Park (SEK430) operators were required to check the AQI before making site visits due to poor air quality caused by Complex wildfire.
    - Addressing new administration's priorities.
    - Building tribal monitoring capacity.
    - Establishing routine communication with tribal partners.
    - Monitoring persistent pollutants.
    - Modernizing ambient air monitoring networks and infrastructure.
    - Building in climate resiliency.

<u>Questions/Answers/Comments</u>

None.

CAPMoN Update (Jason O'Brien)

- New Site: Bratt’s Lake, SK
    - Construction underway.
    - Measurements anticipated in early 2022.

- Laboratory Accomplishments
    - Sent out all sampling media to all sites.
    - 25,000+ samples awaiting analysis.
    - Got caught up on data reporting, training, and updating SOP's.
    - Special assignments for Lab staff.
    - IM/IT development of CAPMoN Lab applications, and e-SHF.
    - Drafted plan for special study to access stability of backlogged samples.
    - Performed workplace planning.
- Working on a LIMS-type Lab application.
- Field Accomplishments
    - Maintained instruments in field.
    - Updating SOP's.
    - CAPMoN infrastructure projects.
    - Training courses.
    - VINS precipitation sample bag issues.
    - CAPMoN site status board.
    - Modification to field operations Lab for COVID-19 safety.
    - Ozone remote audit procedures.
- New Instrumentation
    - Field
        - Continuous $PM_{2.5}$ with temperature-controlled enclosure (March 2020).
        - D400 upgrades (actuator covers/actuator testing).
    - Lab
        - New FIA (NH_4 and TN) March 2021.
        - New ICP (metals) awaiting approval.
- Return to the workplace: work currently on hold due to COVID-19.
- Recent publication: "Inorganic chemical components in precipitation in the Eastern U.S. and Eastern Canada 1989-2016: temporal and regional trends of wet concentration and wet deposition from the NADP and CAPMoN measurements".
- CAPMoN data can be accessed at: https://open.canada.ca/en/open-data, search CAPMoN.

Questions/Answers/Comments

14:54:53 From Greg Wetherbee : Jason: If you guys are looking for an important activity to accomplish during lockdown, I have one, and I can help. We need to write another paper on the NADP/CAPMoN co-located site data comparisons at PA15 and Friehligsburg. Sorois,Vet, and Lamb did the first one, then I published a follow-up (2011?), and now it's your turn again! Kidding, of course, but you could take the lead on that. First task is to turn the event-based CAPMoN data into weekly data for comparison to NADP. Just an idea!

14:57:29 From Amanda Cole: Greg, you and I should talk about that soon!

14:57:29 From Camille Danielson: What brand of FIA did you get Jason?

14:58:00 From Cheryl Sue: we got the FIA lab flex

14:58:46 From Cheryl Sue: we haven't done comparisons yet but will share after done

14:59:38 From Camille Danielson: That would be great to see and to hear how you like it - did you have Lachat before?

15:00:00 From Cheryl Sue : yes we had Lachat.

USGS NGWOS Update (Mike McHale)

- Tabled until Friday at NOS. See NOS notes.

Questions/Answers/Comments

Status of Methylmercury Measurements (Camille Danielson/Martin Shafer)

- Methylmercury is analyzed from composite samples from seven MDN sites.
- Composites are collected monthly.
- When composite is complete, samples are distilled according to EPA1630.
- After distillation, samples are analyzed on a Tekran 2700. Maximum volume that may be analyzed is 30 mL.
- Of the 6,197 taken between 1996 and 2015, only 76 samples had concentrations ≥ 0.33 ng/L…no contamination or debris, QR=A or B.
- Since WSLH started analysis of methylmercury samples in precipitation:
    - 122 samples analyzed.
    - Only 4 of the 122 samples were above the detection limit of 0.1 ng/L.
        - All were < 0.2 ng/L (LOQ=0.33 ng/L).
        - In 3 samples, at least one component of the composite was given a debris note.
        - The one sample with no debris note was measured at 0.10 ng/L.
    - 27 composite samples were created and tracked that ultimately contained insufficient volume (<30 mL) to be analyzed.
- Methylmercury in precipitation is largely not detectable. When detectable, it is challenging to determine if the methylmercury was:
    - Deposited as methylmercury or,
    - Contaminated by mishandling, debris, insects, etc.
- In either case, biotic alkylation of inorganic mercury in the environment after deposition should quickly outpace direct deposition of methylmercury.
- Proposals from WSLH:
    - Discontinue analysis of methylmercury in precipitation except for special projects. The method will be maintained by WSLH to support surface water monitoring programs.

- Stop composting samples. Methylmercury will be analyzed from individual samples with a volume greater than 200 mL (aliquot collected before bromination for total Hg). This could either include or exclude debris/contamination samples.

Questions/Answers/Comments

15:12:29 From Sandy Steffen: sorry my computer doesn't like zoom. While I am not a water expert I am an analytical chemist and this is not good.

15:12:55 From Sandy Steffen: I think a full sample once every month or 2 months should be started to see how the numbers change.

15:13:13 From Sandy Steffen: If there is little change then I would stop measuring.

15:14:52 From Sandy Steffen: I just don't like cutting things off right away and logically seeing what the real issue is. We likely know that there is no MeHg there but prove it to yourself.

15:15:53 From Sandy Steffen: Yes its worth it to discuss to MELD but maybe collect this other info first before you bring it to the experts in the fall?

15:16:27 From Sandy Steffen: I think he is on holidays.

15:16:39 From john offenberg : Is it safe to assume that the MeHg effort was initiated without a 'threshold in order to continue' built in? Is it too much of a revisionist history approach to make that determination now?

15:19:21 From Sandy Steffen: I agree with Jamie, but I would start with the idea of doing MeHg samples only for a few times (non-composite samples) before you bring it to MELD. Is there a huge rush to decide now?

15:19:51 From Sandy Steffen: I am here because Greg mentioned it but...I can't speak for others.

15:22:08 From Douglas Burns: So organize a small meeting under the MELD umbrella to discuss MeHg in precipitation and try to get participation by a group of key scientists? Makes sense to me.

15:22:24 From Ryan McCammon: I agree with Doug.

15:25:06 From Joshua Ray: I operate the NJ MDN site only, I don't actually look at the data, but I will be passing on this information on to our air monitoring director

15:26:01 From John Offenberg : I agree w/ Jamie's comments on the distinction between an ability to measure vs importance, and wonder if a quantitative criteria for 'deciding how to proceed / or stop' should be determined prior to any switch from compositing to non-composited or other possibilities that might be considered.

15:27:34 From Ryan McCammon: Greg has a good point: if nobody's using the data, then let's get some sites in the west to fill-in the gaps.

15:30:02 From Ryan McCammon: Good to know about the Minnesota details. I've changed my mind :)

15:30:08 From Sandy Steffen: I think this is the hail mary toss to assess if the data is worth pursuing but i think its worth it to convince ourselves by tying the non-composite samples and make this an issues at MELD in the fall

CD: Let's try option 2 first, then circle back. KM: agreed.

DG: Go back to State of Minnesota and present this issue to them to see what they want to do (since they are paying for most of the sites).

HAL Lab manager (Christa Dahman): Stop compositing on all Minnesota sites. KM: Report out results at Fall meeting.

Virtual CAL, HAL, and PO Audits (Richard Tanabe/Greg Wetherbee)

- CAL, HAL, and PO are supposed to be reviewed every three years.
- CAL and HAL are overdue to be thoroughly reviewed per NADP requirements.
- PO has not been reviewed since move to WSLH.
- Combined CAL/HAL reviews planned for September 2021.
- Progress to date:
    - Guidelines for Virtual Lab Reviews have been drafted, and should receive QAAG approval soon.
    - Review Team
        - Greg Wetherbee (USGS) – Lead, QA/QC
        - Cheryl Sue (ECCC) – Analytical operations, QA/QC
        - Tim Sharac (EPA) – HAL and AMNet
        - Melissa Puchalski (EPA) – AMoN
        - Emmi Felker-Quinn (NPS) – Nominated for Hg Litterfall Network
        - Chris Rogers (Wood) – IT
    - Facilitators
        - Richard Tanabe (PO/NED)
        - Camille Danielson (CAL)
- Scope
    - Are laboratory activities appropriate and effective?
    - Are laboratory activities documented in the laboratory QAP and SOP's?
    - Do laboratory practices comply with the QAP and SOP's?
    - Do laboratory practices ensure data quality consistent with the expectations of the NADP?
- Records to be reviewed:
    - QMP and SOP's.
    - Quality Assurance reports.
    - Training records.
    - Internal review reports/finding.

    - Health and Safety documentation.
    - Primary focus:
        - Analytical data records and scanned logbook pages for Review Team-selected sample analyses.
        - Field data/sample login forms (e.g., FORF's and MOF's).
    - Other relevant documentation for specific issues.
- Timeline for Virtual Laboratory Reviews: from early August 2021 to presenting results to QAAG and NOS at the Fall 2021 meeting.

Questions/Answers/Comments

CW: Why isn't the PO being reviewed as well? GW: There's too much to do all at once. Need to do the PO review with people are more advanced in management (different skills/angles) for doing a PO review.

Fall Meeting 2021 and Science Symposium (John Walker)

- As of 7/20/2021, both will be virtual. See John's July 20th email.

Spring Meeting 2022 (Ryan McCammon)

- April 18-22, 2022, at The Concourse Hotel.
- Hybrid virtual/in-person meeting.
- Deadline for reservations: March 20, 2022.
- Do we need to reevaluate how we conduct our meeting (i.e. streamline our efforts)?

Questions/Answers/Comments

DS: Disagrees somewhat with suggestion. We have more time to devote to NADP science working groups meeting in the Spring as opposed to Fall. Agree that we have too many duplicate presentations.

WL: Coordination between the NOS chair and the other subcommittee chairs.

RT: We should send subcommittee draft agendas out the Google/NADP "Announce" email list and potentially reach more people rather than having them drilldown on the NADP website for those agendas.

RG: Cut back on the science committees report out at Joint. Could just talk about topics that weren't talked about in subcommittees.

CR: Past Chair tasked with providing (per the Gov Handbook) coordination of meeting agendas for the science committees and subcommittees. We just need determine how to implement this.

DG: We could add an additional room for a third competing subcommittee or could meet at night.

KM: We have many more subcommittees now. So, it takes longer to report out in Joint. Need to determine how many people don't attend EC meetings and look for that summary at the end of Joint. If that audience does not exist, then report out could be done EC.

RT: With new website coming, we can post report outs faster.

CC: Couldn't we just mention motions in Joint? GW: Likes idea.

CD: Should we combine agendas into a single day's agenda with breakouts listed in time order.

DS: Why is NOS and Joint split?

RM: Just have NOS in one day.

RT: Have Joint earlier in the week.

CD: Distinguish updates/science presentation/some topic requiring discussion.

Ad-hoc subcommittee to determine Spring 2022 block agenda. RT, MO, SI, and CD.

15:51:18	From Nathaniel Javid: The spring 2022 contract is not finalized but in the works and we have the space reserved
15:54:40	From Jamie Schauer: April 22, 2022 is Earth Day - We should try to have some event at the meeting to honor Earth Day
15:55:08	From Douglas Burns: Duplication of presentations is one issue but another is two meetings going on simultaneously, which poses a tough decision for those who are interested in both topics.
15:56:36	From Mark Olson: We clearly need more time in NOS than the 4 hours dedicated this year.
15:57:17	From Melissa Puchalski: since there are fewer overlapping meetings, it might not be necessary to do the subcommittee reports in joint
15:58:49	From Eric Hebert : and motions
16:00:17	From Alexander Nyhus : I think it is important to keep the interest of scientific research, as it keeps the interest of site operators and those who want to invest in NADP collection. Also unless redundancy is needed, it would be best to keep topics specific and separate.
16:03:04	From Mark Olson : Agree subcommittee reports should not be in both Joint and Exec
16:06:21	From Eric Hebert : topics by subject not committee?

16:09:06 From Andrew Johnson - Maine DEP : Another way to get at the same point Kristi made about Joint vs. EC participants, is how many EC members haven't already been present at Joint, except for maybe Dave Beuler (sp?)?

Final Discussion/Questions/Wrap-up (Winston Luke)

None. Ran out of time. There was no motion to adjourn.

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