Joint Meeting

Session I: November 1, 2021, 11:00 - 13:30 EDT

Minutes taken by Ryan McCammon

Welcome and Introductions (John Walker/Jamie Schauer)

State of NADP (David Gay)

- COVID effects
  - Missed 699 samples (5% of a normal year).
  - PO and Labs have been operating continuously throughout.
  - NTN: 170 of the 260 active sites met NADP completeness criteria.
- NTN
  - Lost 6 sites (CO83, CO13, CO85, TX02, MO05, and WV99). Added two sites (CO82 and OR07). Will gain 4 sites in 2022.
  - "Snipit" TNTP
    - Total P seems to be working fine, mostly small contributions
    - Total N (and Org N by difference).
      - Some good.
      - Some negative O Nitrogen, so we have work still to do.
      - Likely to add more sites and more samplers.
- MDN
  - Lost one site: IL11 (AMON/NTN will continue).
  - Still have map holes, mainly in the west.
  - Should have the 2020 report out before the end of 2021.
- AMNet
  - Lost one site (MS12), gained two sites (AK95 and IL69).
  - Dry deposition estimates: NADP will need to review and decide if/how it wants to release the Muge study results.
- AMoN
  - Gained one site (MD01).
  - Ongoing effort on recoating cores.
    - Largest cost to AMoN ($15/core=$50,000/year with 110 sites).
    - Still working on this issue.
- Litterfall
  - 23 sites running.
  - Considering an analytical change for improved efficiency (will discuss during Joint 2nd Session).
- General news
  - 2020 map summary
    - Available on the web

        - Printing 1500 copies to distribute to operators, supervisors, and Federal agencies.
    - New website is up and running.
- 2022 Spring NADP Meeting
    - Hybrid at the Concourse Hotel.
- 2022 Fall NADP Meeting
    - In-person in Knoxville, Tennessee at the University of Tennessee.
- Recycling issues
    - Cost a big problem.
        - Gloves (~$1200/year).
        - 60,000 bags (~$4000/year).
    - We are starting a new partnership with Reynolds and our entire bill for recycling may go to about $1000/year.
- John "Jack" Beach death: https://www.onlineathens.com/obituaries/p0158783.

Questions/Answers/Comments

Greg Wetherbee: Two new NTN sites: MO46 and TX41. TN00 moved to University of Tennessee. OK17 moving to OK06.

Winston Luke: How many site operators are participating in online training? Richard Tanabe: 50-60.

Amy Mager: send in your bags for recycling.

Donna Schwede: Regarding sites moving: we need to know if a site moves for modelling purposes. David Gay: if a site moves more than 10km, need a new siteID (due to model grid size).

NOTE: Even if a site moves < 10km it might move outside the existing 12km grid depending on where it was located within the grid. This is important to know for model evaluation and NADP does not currently track/report site moves that occur but are less than 10km from the original site location.

10:18:57 From Kristi Morris to Everyone:

AK02 is NPS :)

10:31:00 From Cari Furiness to Everyone:

Is there a tentative date for the spring meeting?

10:32:08 From Tom Butler to Everyone:

Do I send my used NTN bags back to Madison, so they are recycled?

10:32:53 From Ryan McCammon-BLM-WYSO to Everyone:

We have a hard date: 4/18-22.

10:33:14 From Colin Kelly to Everyone:

At one of last week's sessions, one of the presenters suggested that moving forward meetings/symposiums should have a mixed format of in-person, and online. The reason the person gave was they probably would not have attended if was in person due to cost/travelling logistics. I think this is a good idea.

10:33:38 From Kristi Morris to Everyone:

no worries!

10:39:29 From Melissa Puchalski to Everyone:

@Donna - at least the site we are helping with (TX02 -> TX41) the site will change IDs. Is there anything you need besides the stop/start dates and new IDs? I don't think we ever came to a consensus on what to do with the sites that move < 10km.

10:41:09 From Donna Schwede to Everyone:

@Melissa - we did not come to a consensus. If the site ID changes, then it isn't a problem. More problematic is when they move < 10km. Maybe the site file needs to have a date on it to indicate when it was updated and all previous versions need to be provided?

10:43:13 From Greg Wetherbee to Everyone:

Picking up on Colin's suggestion - Just like if sponsors don't fund sites, we don't have a network, so it goes with symposia where if we don't have paying attendees, we don't have a symposium. Therefore, if we are going to have a hybrid meeting with virtual attendance, I would strongly suggest that if someone wants to present a talk or poster, then they need to be in attendance in person, and we keep the virtual attendance to a YouTube live stream. Just my opinion.

10:46:13 From John Walker to Everyone:

I agree, Greg. With a hybrid option, which I support, we need to think about how we can keep in-person attendance at a healthy level. Requiring presenters to attend in person would help.

10:54:09 From Greg Beachley to Everyone:

I'm glad that we will discuss the hybrid option and some guidance for virtual and in-person attendance. I think we also need to consider the science (and other) committees as well. TDep has experienced a spike in attendance with the remote access, so there is a lot of benefit in the virtual. Also we have had virtual presentations at in-person meetings, so I agree that we need to stakeout a balance between the virtual and in-person attendance.

10:55:15 From colin kelly to Everyone:

possible suggestion for Hybrid meeting model; Free, viewer only on YouTube, Full Price for in-person attendance, a nominal fee for those that want to participate via Zoom.

10:56:07 From Doug Burns to Everyone:

I think that we should consider allowing some international presenters to attend virtually just to keep our meeting open to those who would like to present but don't have the funds to attend the meeting.

10:56:21 From Cari Furiness to Everyone:

Cost is likely to be higher for hybrid technology

11:00:57 From Colin Kelly to Everyone:

another that came out of some of the sessions last week- inviting government agents to attend the symposium to increase exposure of our work, and more actively engage and inform them.

11:01:00 From Greg Wetherbee to Everyone:

Priority 4 - International Participation and Collaboration - USGS is going to reach out to David Kelleghan (Rep. of Ireland) on integrated deposition/ecological monitoring network strategy that they are implementing. Is there potential to incorporate Nat. Phenology Network to do the ecological monitoring part to correlate with NADP? Just a thought. We'll talk to David in the next week or two.

11:02:38 From Andrew Johnson - Maine DEP-BAQ to Everyone:

I support the hybrid meeting format, but just want to note that by offering a remote attendance option will make it challenging for some (including me) to get approval to spend travel funds for in-person attendance.

11:04:58 From John Walker to Everyone:

Good point, Andy. I suspect that might be an issue for some Feds too.

11:09:37 From Emmi Felker-Quinn to Everyone:

The fall NADP meeting has grown into a two week event. What if in the future we had an online week of science symposium and an in-person/hybrid week of committee meetings?

11:10:23 From Greg Wetherbee to Everyone:

Right, Andy. Let’s say that several people from the same agency want to go to the meeting and someone in that same agency says "oh, I just want to attend virtually," and that leads management to decide that everyone will attend virtually to save money. If that happens enough times, then we cannot pay for the $50/gallon coffee bill for the in-person meeting. We pay about $10-15K for meeting space and(or) food. That's a lot of registrations. I predict that if you do the hybrid meeting, then this useful technology (Zoom) will kill our in-person meetings which are way more productive because of discussions and opportunities for collaboration which are revealed at meals and in the evenings, will be completely lost. I would be okay with

international participation on Zoom for Science Committees and Technical Committees only, but not the symposium.

Strategic Planning & MDN Network Viability Discussion (David Gay)

- Executive Committee suggested prioritizing strategic initiatives (Status since Spring 2021 meeting).
    - Priority One: Sustainability of NADP Networks: Status=Progress
    - Priority Two: Expansion of NADP participation, audience, and data users: Status=Some Progress
    - Priority Three: New networks and initiatives. (PFAS, Total P&N, NTN Dry Deposition, and NAPNet / PollenSense): Status=Progress.
    - Priority Four: Develop strategies for international engagement and capacity building: Status=Not much progress.
    - Priority Five: Research and Scientific Developments: Status=Some progress.
    - Priority Six: New Products to Increase Scientific Relevance: Status=Some progress.
    - Priority Seven: Use New Technologies: Status=Not much progress
    - Priority Eight: NADP Governance and Organizational Changes: Status=Some progress.
- Priority One: Sustainability of NADP Networks.
    - NTN is doing pretty well overall.
    - AMoN is growing.
    - The sustainability issue is with the Mercury Programs.
    - MDN continues to add sites.
- Priority Two: Expansion of NADP participation, audience, and data users.
    - FWS attempt to add MDN (and NTN) sites to more refuges
    - EPA working with Tribes
    - Idea from budget of passive initiative for Hg, with likely new sites, new support organizations, new data users
        - This also has potential international implications
        - Can run this network wherever you wish
- Priority Three: New networks and initiatives (PFAS, Total P&N, NTN Dry Deposition, and NAPNet / PollenSense).
    - PFAS continues to lead here
    - Significant movement forward on SnipIt Sampler (TNTP)
    - Passive initiative for Hg, proposed by budget
    - Dry Deposition model moving forward, with finalization soon,
    - NAPNet/PollenSense: project ending now, ability to use NADP as a pollen network, and PS operation
- Priority Four: Develop strategies for international engagement and capacity building.
    - Not much progress
        - However, the international aspects of a Passive Hg Collector are possible

        - If you consider tribes international (as they are), then we have begun to work on increasing the tribal contribution to the mercury networks
- Priorities Five and Six: Research and Scientific Developments/New Products to Increase Scientific Relevance.
    - Good progress
        - PFAS continues to lead.
            - Working on PFAS in a larger network of wet deposition.
            - Martin Shafer is also beginning an atmospheric measurement project.
            - New lab in shared space at Henry Mall.
        - SnipIt Sample (TNTP)
            - TP is looking good.
            - TN isn't quite as good, but mostly in the right direction.
            - New audiences and new data users here.
- Priority Seven: Research and Scientific Developments.
    - Not much progress.
        - Potential Passive Hg work here
        - Mark/Wyatt/Richard redesigning the sensor electronics
        - New style of training videos.
        - Redesign of final QA.
- Priority Eight: NADP Governance and Organizational Changes: Not much progress.

Questions/Answers/Comments

10:46:03 From Donna Schwede to Everyone:

For the Hg networks, do we have global modeling results that provide an estimate of what the concentrations are in the west? Can or are we using this information to motivate new sites? David Gay: We haven't done that, but it's a good idea. Donna: checking into statistical techniques to determine where we need monitoring. David: let's get with Muge to figure out paths forward. John Walker: we need to use satellite data to assist in this effort.

Website Update (Richard Tanabe/Bob Larson)

- Richard gave a virtual tour of the new website and got a lot of kudos concerning the redesign.

Questions/Answers/Comments

None.

Lab/Network Updates

- **Sample and Data Processing (Amy Mager)**
    - Sample Processing.
        - Receive/login/data entry on samples all networks (NTN, AMoN, MDN, MLN).

        - Receive/clean/ship sampling supplies for all networks.
        - Collect all necessary supply/sample QC.
        - Contamination coding/pH/Conductivity/filter NTN samples.
        - Store sample archive, process, and ship special studies samples.
        - https://youtu.be/C6pZB5zW4m0
        - Network Equipment Depot (**NED**) is also located at Henry Mall.
    - Data Processing
        - Review precipitation, field, and analytical data for every sample received
        - Error flags, notes codes…QR (quality rating) Code for each sample
        - Preliminary reports sent to sites monthly
        - Publish data to Program Office to website

    - NTN Bag Sampling
        - 1 year in! (started in Oct., 2020; 99% of sites converted by May, 2021)
        - Smooth transition overall
        - Operator training sessions via Zoom
        - Supply shipping – proactive, utilize a supply questionnaire and close communication with sites
        - Cost savings:
            - Reduction in shipping costs and labor ($70K/year for NADP)
            - Shipping savings for sites = $400/yr
        - Currently exploring a thinner bag – cost savings, easier for operators
        - Supply Chain Shortage
            - Pandemic resulted in supply chain shortage of raw materials, especially plastic.
            - Supply is good.
        - Sample Archive/Special Studies
            - Sample Archive
                - 5 years' worth of every sample with enough volume, oldest year rotated out - Refrigerated
                - Forever sites, save every sample forever (WI06, IL11, NH02, NE15) - Frozen
                - Fixed sites, save one sample per month forever (CA99, CO99, FL11, NC41, NY20, OR97, TN11, TX16, WV18, WY00) - frozen
                - IL11 forever samples are now in Wisconsin!!
                - All samples out of the Biotron – cost savings
            - Special Studies
                - Average about 1 request per month
                - Incoming samples and archived samples
                - 2020/2021 have brought many special requests: PFAS, COVID, Wildfires, Blizzards

        - PFAS – currently pulling samples from 8 NTN sites for EPA project; interest continues to grow
    - Mercury Litterfall Network (MLN)
        - LIMS modules have been developed for login and processing of MLN samples
    - Field & System Blank Program
        - Dry week, site pours control solution through the collection system
        - Assess background contamination
        - NADP staff taking over prep shipping of samples for this program in 2022
        - Gain efficiencies - ship in supply boxes that are already going out
    - Data Review and Reporting
        - Data are reviewed and reported based on monthly data sets
        - Preliminary data from the CAL and the HAL are reported to site operators and published to the PO (goal = 90 days from the end of the sample month)
        - PO publishes the data to the NADP website (goal = 30 days after receiving from lab)
        - Have been at 90 days +/- 10 days starting with the Jan 2021 data set; Aug 2021 data in review process for all 3 networks
        - Branched approach to data review working well (review/resolve field operations issues within 1-2 wks: gaps/overlaps, site ops, precip issues)
        - Continue to work on streamlining/efficiencies in process
    - Data Review Priorities and Improvements
        - Move forward with branched data review workflow processes (vs linear)
        - Examine & implement more concise/complete presentation of sample validity data on the NADP website
        - Evaluate & revise NADP sample hold times for qualification & validation purposes
        - Continue to evaluate historical comparison of analytical chemistry for sample validation

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

11:36:29 From Donna Schwede to Everyone:

Is the 90 day goal for preliminary data or finalized data?

11:37:24 From Zac Najacht to Everyone:

Donna - Preliminary reports sent to sites 90 days

11:40:14 From Cari Furiness to Everyone:

Is the PFAS sampling done as subsamples of submitted precipitation samples?

11:44:07 From Amy Mager to Everyone:

Whatever is left after we process the sample is submitted for PFAS analysis in the original bottle it was received in.

- **CAL Update (Chris Worley)**
  - Instrument updates
    - Lachat flow injection system production was stopped on March 27th, 2020. Lachat is used for NTN Ammonium, Phosphorus and AMoN.
    - Our Soils department has purchased 2 FIAlab instruments (TP, NH4/NO3). Opportunity to evaluate and receive feedback.
    - No major issue with IC's or ICP.
  - AMoN Dip Coating (PRO VS. DIPPER)
    - Had good results until…
    - Exposed to higher concentrations (manure slurry pit)
      - Big difference with higher concentrations.
      - As a result, need to reevaluate whether we should shift to gas phase deposition instead of using the phosphoric acid dip.
  - AMoN Diffusive Bodies
    - Currently utilize diffusion bodies 5 times then pull from circulation.
    - Explore increasing to 10 uses (cost savings).
  - AMoN: 2 weeks versus 1-month deployment comparisons. Tom Butler studies.
    - Results were comparable.
  - NTN sampling bags
    - Halfway through our NTN bag inventory.
    - Contacted VINS Plastic for quote on next set/lot.
    - Currently using 3 mil (thickness) extruded NTN bags.
    - VINS is offering and alternative adhesive method. The adhesive is an aromatic catalytic polyurethane adhesive terminated with an Isocyanate. After 7-Day cure the system is inert and should not have migration
    - WSLH has ordered 100 bags using the adhesive process with a reduced thickness of 2 mil (vs our current 3 mil) to evaluate. CAPMoN is currently evaluating as well
  - TN/TP update
    - No SO_4 crossover from SNIPiT to NTN bucket (that was a concern)
  - NTN 1L Samples-Acidifies
    - Organic Nitrogen relative to Total Nitrogen: Mean of samples was 13% organic nitrogen
  - TN/TP SNIPIT WI-06 Results
    - 10 samples
    - Results showed negative values

        - Like to expand data set to assist in this effort
    - 2021 Proficiency Testing Status
        - ECCC- Maintain rating of "Good" (Poor, Fair, Good, Very Good).
        - No flagged or warning limits exceeded, but we exhibit bias on multiple parameters.
    - WMO and USGS PT
        - SO4 percent difference was low
    - CAL External Review
        - Late September NADP conducted an External Review of the CAL.
        - Will be receiving the final review report shortly.
        - Exit review was positive overall
    - Major CAL Changes

Date	Change	Reason
4/26/2021	Started new rinse in protocol after pH standard FLPH	Identified standard carryover issue due to replicate failures
5/3/2021	Stirring of pH measurement and calibration sample tubes begins	Improved precision and accuracy with stirring protocol
5/27/2021	Beginning May 28, 2021 a second order calibration curve will be used for orthophosphate on the Lachat.	Improving accuracy
6/3/2021	Starting on 6/3/2021 a second archive sample bottle for NTN will NOT be collected. One bottle will be filled as full as possible and sent over for analysis and any remaining sample will be saved and returned for archiving. The exception to this are the fixed and forever sites which will still have archive samples collected in a second bottle per usual process.	Due to major supply shortages worldwide this will also be more efficient and save resources
7/6/2021	Not a permanent change but due to worldwide shortages of plastics our supply QC for some things such as bottles will be less than the SOPs/QAPs require until supplies are no longer so limited.	Due to major supply shortages worldwide this will also be more efficient and save resources
7/21/2021	ICP analysis changed to a single curve, dropped High FL since single curve	To simplify ICP data assessment after much validation
8/20/2021	Expiration date for AMoN reagents extended to 3 weeks.	After validating this was acceptable it will save resources

- **HAL Update (Mark Olson)**
  - Mercury Analytical Lab (HAL) at WSLH
    - 2020 QA report is complete
    - HAL prep lab remodel is complete (moved in May 2021)
    - Total and Methyl analytical systems working well
    - Promoted Chris Lepley to HAL chemist
    - Site numbers are steady to slightly increasing
  - MDN Improvements May 2021
    - New MDN Prep lab: remodeled and redesigned former BSL-3 lab, Henry Mall room 511
    - Includes anteroom and internal storage
    - Delivery of two polypropylene fume hoods 11/2020 (second hood to be shared with PFAS until 507 is complete
    - MDN prep hood has in-counter 70 L acid bath
    - Occupancy occurred 5/3/2021
  - HAL equipment quality assurance
    - HAL ongoing QA analyzed for Total Hg
    - Monthly, weekly, and as needed checks
  - MDN Field QA
    - USGS system blank program-NADP in 2022
    - Arboretum WI06
      - Field blanks performed after dry week(s)
    - Devils Lake WI31
      - Field duplicate study (June 2020 to present)
      - N-Con dual chimney (percent differences were pretty good)
    - Mount Horeb
      - Aerochem evaporation study: complete (PETG bottles help)
    - Lab
      - Acidification study is not complete
    - MDN Stability
      - Three dual chimney NCons used (6 samples)
      - Three samples spiked at 8 ng/L, three at 16 ng/L
      - All samples 500 mls DIW with 20 mls 1% HCl (typical MDN acidification ~0.04% HCl (EPA 1631 1% HCl)
      - Samples collected at 0, 7, 14, 21, and 28 days
      - Missing Hg? Bottle walls?
      - Will increase acidification, analyze subsample
      - Then Brominate (oxidize) and analyze
      - Results
        - Low recoveries for subsamples
        - >100% recovery for in-bottle (1% HCl in-bottle)
        - Mercury is sticking to walls

- MDN Pre-Oxidation Subsampling
    - Study initiated due to bottle shortages
    - Found up to 80% difference in sample concentration by digesting in a separate vessel versus in-bottle
    - MDN samples chosen from a wide range of sample volumes
    - Raised concerns of inadequate acidification of samples (Hg sticking to bottle walls)
- Surface water subsampling
    - Repeated this test with a surface water sample, this is acidified to 1% HCl prior to oxidation
    - Still saw loss when digesting in a separate vessel versus in-bottle
    - Further testing needed
- Total Hg concentration are likely not affected in majority of MDN samples
- Sites with MeHg aliquots removed may be affected
- Guey-Rong presented small difference in acidification: acidified versus non-acidified (4% difference)
- NADP and TECL will continue to investigate and report more during Spring 2022 meeting

- MDN Web Data Problem
    - Investigated an excess sample overflow problem
    - Problem with MDN preliminary reports: deposition values were an order of magnitude low
    - Web site data problem: deposition was set equal to Mercury concentration
    - Affected 2545 values on the web for 11 days (9/27-10/8)
    - Affected values were random only changing 46% of the MDN deposition from 2/27/2019 to 1/19/2019 (2545 of 5513 obs.)
    - All data have been corrected and confirmed
    - Need to investigate why and how, and then inform users
    - WSLH Occurrence Report filed.
- AMNet Update 2021
    - Down to 12 sites from a peak of 26
    - NY06 (Bronx) moved to NY98 (Whiteface)
    - MS12 moved to Barrow, AK (AK95)
    - 3 GEM: 9 speciation units
    - Last site visit was December 2019
    - Loaner program being used for repairs, 1135 to OH02 and NJ30
    - Site visits to resume in early 2022
    - Back-up site liaison left for a different job

        - 2020 data has been validated and is online
        - 2019-2020 QAR is complete, two years combined, only two site visits
    - AMNet: Tekran Trailer
        - Midwest (MI, MN, WI) mercury trailer was donated to NADP in 2019
        - USEPA sampling air quality in East St. Louis, IL area
        - Deployed June 2021
        - Analyzing GEM, GOM, and PBM
        - Deployment through December 2021?
        - NADP needs to perform a site audit soon
    - Mercury Litterfall Network (MLN)
        - Approved by Joint 2017, Exec in 2021
        - 23 sites in 2021
        - Subsampling showed too much individual variability
        - Oven drying comparted favorably to freeze drying samples
        - SOP will be edited to include oven drying
        - Need help with collector processing and data reporting
        - Where to house data? Is this PO responsibility?
    - Passive Hg Study
        - Henry Mall 6th floor conversion for passive mercury
        - Tekran speciation system
        - Lab comparison with NADP, Tekran, ECCC, and Taiwan
        - Method intercomparison: Passive mercury, Japan GEM, USGS isotope, Reno cation exchange filter, NOAA Rx mercury system
        - Each group provided equipment and analysis
        - NADP provides collection, data reports, and maintenance
    - NADP and PFAS
        - Remodeled old Hg prep lab (HM508) to accommodate PFAS
        - New hood for sample prep
        - Upgraded power to accommodate a SciEx 7500 LC MS/MS
        - PFAS field QA looks very good for blanks and spikes
        - Testing bag sampling for PFAS collection
        - Developing method for PFAS in air using Hi-Vol
        - Projected lab completion data 12/30/2021

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

11:46:36 From Cheryl Sue to Everyone:

CAPMoN also purchased those FIA systems. we will share our validation studies

12:02:45 From Mike McHale to Everyone:

Which FIA system is being used to replace the Lachat? Which manufacturer and instrument?

12:03:46 From Doug Burns to Everyone:

FIAlab is the company name I believe

12:04:59 From Cheryl Sue to Everyone:

yes FIAlab

12:34:20 From Greg Wetherbee to Everyone:

Mark: So, we've learned that subsampling does not work for this study, but the way that MDN samples are collected and analyzed currently are fine because the BrCl oxidation is done without subsampling - except for MeHg subsamples, which is another story. So, the way that this stability study has to be done is with single-chimney, co-located collectors where 1 collector is weekly and the second is bi-weekly or monthly. I have an N-CON MDN collector on the shelf. We could use this for a co-located study in Madison. I think the study needs to have a second phase as this is still a worthwhile protocol to investigate.

12:43:51 From Greg Wetherbee to Everyone:

Are we collaborating with any other organizations who are trying to measure PFAS in precipitation and ambient air, or is NADP/EPA the only team who is doing this? I don't know the literature at all, obviously. Mark Olson: we are not collaborating with anyone. John Offenburg: There are other group doing this work: ECCC and the State of Minnesota (private contractor).

Session II: November 2, 2021, 13:30-16:30 EDT

Subcommittee/Science Committee Recap (Chairs) - Motions Only

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

- Approved TDEP structures and responsibilities
- Approved Amada Cole as the new TDEP Secretary.

CLAD (Emmi Felker-Quinn/ Jeff Herrick)

- Approved Nifer Wilkening as new CLAD Secretary.

MELD (Colleen Flanagan-Pritz)

- Approved the endorsement of the Passive Mercury initiative so the PO can continue to move forward in developing the initiative.

AMSC (Andy Johnson)

- No motions.

QAAG (Camille Danielson/Martin Schafer)

- Five motions
    - The NADP data management team will adjust field deployment times, field hold times and lab hold times that lead to a qualifying flag per the chart below.
    - Reduce AMoN Field quality control (QC) samples to a minimum of 3 field duplicates and 3 travel blanks per site per year.
    - Change the website data reporting modules to report all network data provided on the web as either VALID or INVALID. All associated qualifying notes will also be reported for both the Valid (former Quality Rating (QR) A or B) and Invalid samples (former QR of C).
    - Approve the:
        - 2020 CAL Quality Assurance Report
        - 2020 HAL Quality Assurance Report
        - 2019/2020 AMNet Quality Assurance Report
        - NADP Quality Management Plan Version 3
    - Proposed new combined review schedule for the CAL/HAL and program office as show in table. With external reviews taking place every three years after the first combined review in 2024. Approved by QAAG.

Questions/Answers/Comments

Re first motion: None. Re second motion: None. Re third motion: Greg Wetherbee use 9/20/2022. Zach: are we using all of the data or just the data moving forward? Winston: use all the data. Zach agrees. Bob Larson: September should be okay. Re forth motion: None. Re fifth motion: Chris Rogers: how many reviewers needed to accomplish. Camile Danielson: we shouldn't need more than who's already on the team. Greg Wetherbee: need one more person to deal with administration and field issues. Greg Wetherbee: a few folks from budget should go to Madison for the lab reviews. Donna Schwede: folks from EPA should be part of the review team.

DMAG (Bob Larson)

- No motions.

NOS (Winston Luke)

- Approved Mike McHale as the new NOS secretary
- Approved ceasing of testing of the KJJ collector and to direct the PO to sell the existing prototypes.
- The Program Office will start replacing 7 and 11 grid sensors with improved* versions starting immediately and continuing to evaluate the sensors at Eagle Heights. The PO will evaluate three 7 grid sensors, old vs. improved set to 50^{o}C vs. improved set to 75^{o}C closed temperatures.

- The PO will record collector openings and exposure for each sensor.
- The PO will encourage ACM sites to upgrade to Theis sensors. Sites will be responsible for upgrades (arm and sensor), maintenance, and replacement of Theis sensors.
    - *Improved sensors have upgraded circuit boards and boxes.
    - Comparison is "Old @ 50C : I @ 50C : I @ 75C
- Friendly Amendment:
    - Any changes to precipitation chemistry resulting from this change will be monitored and evaluated by the Program Office to the extent practical
- The motion approved with the "friendly amendment".

Questions/Answers/Comments

13:01:10 From Greg Wetherbee to Everyone:

The motion has to include co-located sampling and comparison of NADP chemical constituent concentrations at Eagle Heights.

13:01:42 From Greg Wetherbee to Everyone:

Evaluate is too general.

13:05:55 From Mike McHale to Everyone:

Is there a problem just sending Greg a few sensors so he can do the comparison?

13:16:38 From Maria Jones to Everyone:

EEMS records the temperature of the plate before the sensor is activated and then records the maximum temperature and the time it takes for the sensor to reach the max temperature. Charts are produced for the annual report and can be seen in the annual reports.

13:17:48 From Kulbir Banwait to Everyone:

The old sensors set to 50, and yet variable at different sites may still have higher fraction of sites closer to 50 than the extreme 80 oC. Perhaps the 75 oC should be set in relation to what temperature the median frequency temperate is relative to all sites, so the number of samples per year are not drastically affected relatively speaking among all sites.

13:26:13 From Mark Olson to Everyone:

The current set point for sensors is > 50 C. They can be 100 and pass that criteria.

13:30:11 From Mark Olson to Everyone:

The initial evaluation of the NCON was started in 2008, it was approved in 2010

13:37:46 From Ryan McCammon-BLM-WYSO to Everyone:

I probably missed this, but how often do step functions exceed the "white noise" or the uncertainty of the data?

13:47:30 From Donna Schwede to Everyone:

This is an important discussion, but can we resume it in the overflow time and move on with the agenda? Some people may be calling in for specific topics on the agenda and we should try to honor that.

EOS (Chris Rogers/Catherine Collins)

- No motions.

USGS NADP Network Enhancements (Mike McHale)

- Working to enhance and expand our capabilities through one time purchases rather than expanding the number of stations which would require a budget increase.
- NY68 - Biscuit Brook USGS Next Generation Water Observing System (NGWOS) in 2020 added:
    - Soil moisture
    - Air Temperature
    - Relative Humidity
    - Snow Water Equivalency
- Real-time Communications
    - Currently the USGS has real-time communications at 12 stations.
    - The USGS purchased 10 satellite transmitters and 13 cellular modems that will be deployed during the next year (or two). We are working toward having telemetry at all USGS NADP stations
- PM2.5 Purple Air Sensors
    - Deploying 3 Purple Air Sensors at USGS NADP stations, the locations have not been selected yet, but will likely be in the western US
- Additional Sensors at NADP Stations
    - Soil Moisture: There has been resistance to installing soil moisture sensors at NADP stations because the USGS is in the process of making decisions about whether and how to invest in national scale soil moisture monitoring.
    - Meteorological Variables: Although it would make sense to add air temperature, relative humidity, solar radiation, etc. at NADP stations, each of those measurements carries the obligation to service and calibrate the probes and quality assure the data all of which require labor.
    - PFAS: The USGS purchased some PFAS laboratory supplies at the end of FY21 to help the NADP with that effort.
    - PollenSense: Involved as a collaborating agency and are considering putting sensors at some NADP stations, but no decisions have been made yet.

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

None.

Update on CLAD Products – (Mike Bell)

- Most of the products are in the 70-80% completed state. Will talk more about this during the Spring 2022 meeting.

Questions/Answers/Comments

None.

Introduction to Critical Load Video Series (Linda Geiser)

- Linda got a lot of great comments on the video.

PFAS Update (Martin Shafer/John Offenburg)

- PFAS in Precipitation Pilot Study 2019-2020
    - Concentrations of 0.2 to 6.0 ng/L equate to a wet deposition PFAS flux of 0.7 to 21 ng/m2/day (at an annual precipitation volume of 125 cm/year).
    - These fluxes are significant for many environments. E.g., large lakes with long residence times and terrestrial environments with few point sources.
- WI PFAS in Precipitation INTENSIVE 2020 Design & Outcomes
    - Conducted PFAS precipitation monitoring at 8 National Atmospheric Deposition Program (NADP/NTN) sampling sites
    - Two studies
        - Spring/Summer 2020 - Background study at 7 sites (14 weeks)
        - Fall - Source study at 2 sites
            - Marinette - temporary installation
            - Trout Lake - comparison permanent site
    - 22 PFAS compounds were detected in at least 2 samples (6 others in just 1 sample)
        - The carboxylates (PFCAs) were by far the most frequently detected PFAS compound class
        - The C4 – C9 PFCAs were each quantified in over 90% of the samples
        - Except for PFOS, the sulfonates (PFSAs) are much less abundant in the precipitation
        - Fluorotelomers (FTSAs) and Sulfonamides (FASAs) are less frequently detected, but important at certain sites
        - Abundance of the PFCAs generally is inversely proportional to carbon number
    - The high relative abundance of PFCAs, reflects
        - Emission sources
        - Transformations in the atmosphere
        - Precipitation washout factor
        - (PFAS compound analytical menu)
    - WI 2020 Study Results – PFAS Class Signatures
        - Generally similar class signatures at five of the sites:

        - (06, 37, 08, 36, 10)
        - Higher FASA and GENX contributions at sites 31 & 35
        - Higher PFSA contributions at site 35
        - Site 19 (Marinette) is very different – FTSAs are major contributors (in fact 6:2 FTSA is the dominant compound)
            - Point source impacted (6:2 FTSA an AFFF tracer)
            - Site was designed to measure a point source (< 1 mile from the source)
    - WI 2020 Study Results – PFAS Deposition Flux
        - Deposition of PFAS is expressed as a precipitation volume-weighted average for the measurement period (ng/m2/day) [left axis – bars] and extrapolated to an annual flux (µg/m2/year) [right axis - dots]. Sum of all detected PFAS compounds shown.
        - Sites ordered approximately South to North and then West to East. Remarkably consistent total fluxes at 5 sites (06, 37, 08, 36, 10) across the state.
        - 70% higher fluxes at sites 31 (Devils Lake) and 35 (Perkinstown). 100% (double) greater fluxes at site 19 (Marinette)
        - The measured precipitation fluxes of 2-3 µg/m2 represents 25-35% of the annual accumulating flux of PFAS found in the sediment of Lake Superior
        - Weekly fluxes calculated as the product of measured PFAS concentrations and e-gage rainfall measurements at each site. Weekly fluxes then integrated.
    - WI PFAS in Precipitation INTENSIVE 2020 Quality Assurance
        - 80 Precipitation Samples + 47 QA Samples = 127 Total Samples)
        - Field Method Blanks
            - Seven sites, n=13
            - No detects for 32 of 36 compounds
            - Detects for 4 compounds are either below MDLs or just above
    - Key Points / Lessons Learned
        - Concentrations of individual PFAS compounds in precipitation are typically <1 ng/L, though levels can be significantly higher at specific sites/dates. However, the summed PFAS levels can exceed proposed water quality criteria.
        - Regional/background PFAS atmospheric deposition, even in the absence of a local source, may represent the dominant PFAS flux to both terrestrial and aquatic landscapes.
        - The carboxylates (PFCAs) dominate the PFAS composition of precipitation – primarily as a result of atmospheric processing.
        - Legacy PFAS compounds (PFOS, PFOA) are STILL major contributors to PFAS atmospheric pools
        - With the appropriate datasets and modeling tools, one should be able to resolve point/local sources from regional/background levels and sources.

        - A comprehensive field and laboratory quality assurance (QA) program is absolutely essential to the production & documentation of high quality, defensible atmospheric PFAS data.
- PFAS In Precipitation EPA-ORD Pilot Program
    - PFAS in Wet Deposition: 1st Phase Sampling Started Fall 2020
        - Casco Bay-Wolf's Neck Farm, Freeport, ME (ME96). Site Sponsor: ME DEP. 2-years. Start 10/13/2020
        - Whiteface Mountain, NY (NY98). Site Sponsor: USGS. Partner: SUNY Albany. 2-years. Start 09/01/2020
        - Washington's Crossing, NJ (NJ99). Site Sponsor: EPA/OAP/CAMD. Partner: NJ DEP. 2-years. Start 09/01/2020
        - Duke Forest, NC (NC30). 3 years of wet deposition - single sampler - for targeted PFAS. Start 09/08/2020
            - Including co-located triplicate samplers for PFAS wet deposition (several years)
              NOTE: The co-located wet deposition samplers will only operate for 1-year and then NC96 and NC97 will move under the forest canopy for PFAS throughfall measurements
            - NC96, NC97. Start 11/10/2020
    - PFAS in Wet Deposition: 2nd Phase Sampling Starting October 2021 and December 2021
        - Kickapoo Tribe, Powhattan, KS (KS97). Site Sponsor: Kickapoo Tribe. 1-2-years. Start Oct. 2021.
        - Bronx, NY (NY06). Site Sponsor: NYSERDA. Partner: 1-2-years. Start Oct. 2021.
        - UW Arboretum, WI (WI06). Site Sponsor: UW-Madison/WSLH/NADP. 2-years. Start Dec. 2021.
        - Devil's Lake, WI (WI31). Site Sponsor: WDNR. 2-years. Start Dec. 2021.
        - Isolated: NY98
        - Rural: KS97, ME96, WI31
        - Suburban: NC30 (NC96,97)
        - Urban: NJ99, NY06, WI06
    - Collection at existing NADP National Trends Network (NTN) sites
        - Important buy-in & coordination w/ NADP Site Sponsors & Site Operators
        - Integration with existing NAPD NTN sample protocols
            - Limit disruption to standard NTN operations
            - Coordination with NADP Central Analytical Lab and PO (supplies, QA)
            - Apply NTN PFAS tool-kit: bucket rinse (MeOH) & optimized lab processing
            - Weekly PFAS data. Samples pooled across weeks if <500mL of precipitation.

- PFAS Analysis by Wisconsin State Lab (WSLH) after NTN processing
  - 36 PFAS compounds by isotope dilution, SPE-LC/MS/MS
- Status of EPA-ORD/NADP PFAS in Precipitation Initiative
  - 179 samples have been analyzed & reviewed as of October 2021, representing collections through mid-August 2021.
  - Samples collected from mid-August to late September have been analyzed and data are in-review.
- Fluorine in Environmental Samples
  - Analytical Initiatives for "TOTAL" and "TRANSFORMABLE" PFAS In-Progress at UW-Madison/WSLH (for precipitation and other environmental matrices)
    - Combustion Ion Chromatography (CIC)
      - Total PFAS (AOF, EOF)
      - What fraction of total PFAS are we measuring with targeted methods
      - Instrument system installed & validation complete
      - Assessment of EOF/TOF in various matrices will begin Nov. 2021
    - Total Oxidizable Precursor Assay (TOP)
      - Assessment of oxidizable precursors (pools of transformable PFAS)
      - Not all PFAS are "forever"! A substantive fraction may be transformed in the environment (particularly in the atmosphere) to more stable PFAS, including those of special concern due to toxic potential
      - Protocols are in-place and experiments initiated
    - High-Resolution quadrupole Time-of-Flight Mass Spectrometry
      - Determination of TOTAL Fluorine
      - Total Organic Fluorine Extractable Organic Fluorine (EOF) & Adsorbable Organic Fluorine (AOF)
- Quantifying multi-media loadings of PFAS in the Great Lakes basin using targeted and non-targeted Analyses Study
  - Precipitation: NTN Sites in MN, WI, MI, 2 each. Monitored for 2+ years.
  - Tributaries: 24 rivers, high and low-flow periods. Water, suspended and bed sediments, SML.
  - Open Lake Water: 6 sites, epi- and hypo-limnion
  - Lake Sediment Cores: 5 depositional basins, cores finely sectioned, and dated. (cores in-hand).
  - Gas and Aerosol-phase PFAS method validation
  - Gas and Aerosol–phase PFAS measurements at selected NADP sites in parallel with precipitation collection
  - Funded and Supported by EPA-ORD
- "Supersite" PFAS Source/Deposition (Devils Lake & Eagle Heights) Primary Study

- "Supersite" Study Goals
  - ONE full year field-based study (DEC 2021 – DEC 2022), funded by EPA-ORD, with some in-kind support from WDNR and WSLH. Overarching theme – Air Methods/Application for PFAS
  - Continued critical assessment and application of Hi-Vol methods for aerosol & vapor phase PFAS measurement
  - Parallel detailed implementation of wet-deposition collections annual budgets, washout factors, deposition velocities
  - Comparison of measured/modeled atmospheric deposition of PFAS to PFAS accumulation in soil, sediment and water receptors
- Parallel Hi-Vol Validation Study (Devils Lake & Eagle Heights)
  - Formal dedicated assessment/validation of Hi-Vol performance for PFAS measurements in air.
  - Following standard protocol of paired un-spiked and analyte-spiked collection trains in the field.
  - One full year field-based study (DEC 2021 – DEC 2022), funded by EPA-ORD, with some in-kind support from WDNR and WSLH.
  - Full plan implemented in parallel at each of TWO sites, rural (Devils Lake) and urban (Madison, Eagle Heights), for more robust performance assessment.
  - Assessment performed over course of "supersite" study (Slide 1) at both locations (either in sequence with those samples or during "off" weeks), providing great synergy for both projects, and again more robust performance evaluation.
  - Two Hi-Vols (ambient and spiked) analyzed per EPAs preferred protocol (with Filter and PUF/XAD pooled at analysis, generating one value per PFAS compound per Hi-Vol), AND an additional parallel operated Hi-Vol where the filter and PUF/XAD are analyzed separately (providing enhanced capability to understand variations in field performance)

- Other Ongoing and Potential PFAS Projects
  - NTN BAG SAMPLING TRANSITION
    - Current field PFAS protocols fully validated for buckets only
    - Initial BAG evaluation was inconclusive (random high blank and some PFAS loss)
    - BAG Blanking and Spiking studies repeated and expanded earlier this Fall
    - Sample analyses are in-progress
  - POTENTIAL NEW PFAS COLLABORATIONS
    - USGS – Doug Burns
    - Other States (e.g., MI)
  - PFAS IN HUMAN SERUM
    - The WSLH completed a large study of PFAS in serum
    - Over 500 samples from a population representative cohort in WI (UW-Madison SHOW program)

        - A serum method for over 40 PFAS compounds was developed with CDC/APHL funding
- Proposals/Applications In-Review
    - Significance of "Missing" PFAS Pools in Likely Sources of PFAS to Groundwaters
        - Remucal and Shafer (PIs)
        - Detailed PFAS Characterization of Precipitation, Biosolids, Landfill Leachate, WWTF Effluents.
        - CIC (EOF/TOF), NTA (qTOF-MS), TOP assay
        - Missing, transformable, precursor emphasis
        - Soil partitioning and leachability experiments
    - Applications to Host APHL (American Public Health Lab) Association Fellows
        - Fellow A: Air Method Development
        - Fellow B: New PFAS Analytical Technologies
- PFAS Capacity and Capability Building
    - New Research Focused Laboratory sited in the WSLH Henry Mall Location
    - Enhanced Capacity for New Initiatives
    - Greater Flexibility in Methods and Compounds Targeted
    - Pre-Analytical, Analytical and Post-Analytical Functions
    - Dedicated Space for Latest Generation LC/MS/MS (SCIEX 7500)
    - Dedicated Space for Sample Preparation (hoods etc.)
    - Staffed with Experienced PFAS Chemist and a Technician
    - The Technician will have both Field Sampling and Laboratory Roles
    - Time Allocated for New PFAS Method Development
    - Support for Graduate Student Research
    - Expected Synergy with Existing PFAS Lab
- What Next: In-Progress Precipitation Focused
    - Manuscripts: (1) WI 2020 Intensive (2) NADP Pilot
    - Expand "synoptic" sampling using NADP infrastructure
    - Analytical enhancements
        - Very short chain and volatile compounds (e.g. FTOH)
        - Total PFAS (CIC/TOF)
        - Oxidizable component (TOP)
        - Expand scope of targeted compounds
        - Non-Targeted Analysis (NTA)
    - Phase speciation in precipitation
    - Washout speciation processes (Gas, Aerosol)
- What Next: "Air" Focused, Implementation Imminent
    - Gas and Aerosol-phase PFAS method validation
    - Gas and Aerosol–phase PFAS measurements at selected NADP sites in parallel with precipitation collection
    - Particle partitioning modeling
    - Parameterization of atmospheric transformation processes

    - Wet and Dry Deposition Modeling
    - Determine Emission Factors from likely major PFAS sources

Questions/Answers/Comments

None.

USGS External QA Program & CAL/HAL review update (Greg Wetherbee)

- Field Audit and System Blank Programs
    - Sample contamination and stability
    - Transferring sample preparation and shipping to CAL and HAL 1st quarter 2022
    - USGS will continue to provide supplies (reference materials and bottles)
    - USGS will continue to do the data analysis, interpretation, and reporting
- NTN and MDN interlaboratory comparison programs
    - USGS will continue to make samples and ship to participating laboratories
    - USGS will prepare and ship samples at Quality Systems Branch in Denver through calendar year 2022
    - Until FY23
        - Move PCQA project to a new Project Chief and laboratory facilities in January 2023. New location: either NY WSC or WI WSC
- Co-located sampler program schedule
    - OK00/00OK, March 2021-April 2022
    - TX56/56TX, March 2021-April 2022
    - OH09/09OH, January 2022-December 2023
    - NE99/99NE, January 2022-Decembeer 2023
- Publications
    - 2017-18 QA report
    - Data release for 2017-18 QA data is publicly available
    - Data release for 2019-20 QA data still in review
    - "Estimating the urban air pollution contribution to South Platte Reiver nitrogen loads: A case study using NADP data and the SPARROW model", G. Wetherbee et al. 2021, Environmental Management.
- 2021 CAL and HAL Review
    - Findings
        - Data Review and Coding-CAL and HAL
            - Review flagging and qualifiers for AMoN in QAAG to reduce ambiguity in flagging AMoN data.
            - Find and correct null values in AMoN data record for ammonium(NH_4^+) concentration and extract volume
        - Data Review and Coding-Program Office
            - Evaluate the disconnect between PO precipitation data acquisition and analytical data whereby analytical data are "B"-coded instead

of "C"-coded when an undefined sample cannot be confirmed due to missing raingage data.
    - Assist CAL and HAL with first and second findings
- IT Resources and Systems-Program Office
    - Draft data review SOP and a draft editing SOP are requested to be delivered to the QAAG for review by the 2022 Spring Meeting
    - Perform a QA check of web data and review/document the SAS data checking code
    - Prepare a detailed and up-to-date data change log as part of the metadata that accompanies the NADP data by end of Summer 2022.
    - Document the LIMS and all databases no later than Summer 2022
    - Plan for replacement and conversion of LIMS system in a contemporary, well-supported language. This is crucially important for sustained CAL and HAL functionality
    - Replace all existing PDAs in the field with Androids

Questions/Answers/Comments

14:24:52 From Doug Burns to Everyone:

a very naïve question. Are there any natural processes by which PFAS compounds can form in the environment? Or can PFAS compounds form from other human-generated pre-cursor compounds?

14:53:53 From Linda Geiser to Everyone:

Really good to know that EPA is investing in the study of PFAS and that NADP has been able to play a useful role in this research. I was surprised to learn about the vast number of PFAS compounds. Just wondering what fraction might be volatile or semi-volatile and if you would expect higher condensation rates/accumulation at high elevations or polar latitudes and/or continuous deposition and revolatilization of those particular PFAS compounds over time?.

14:55:44 From Kristi Morris to Everyone:

Thought I would let folks know about a USGS study on PFAS in drinking water. They are sampling from 300 locations across the US. PI is Kelly Smalling, NJ Water Science Center. They were taking volunteers earlier in October, Colleen is having her tap water from home tested.....

Litterfall Update, Passive Mercury Network Proposal & Methylmercury in Rain (Mark Olson/Christa Dahman)

- Mark provided a review of what he already presented in MELD and in Joint Session 1.
- Methylmercury in Precipitation
    - Historically, more than 70% of all Methylmercury composites have been below Eurofins' reporting limit (0.05 ng/L)

- Since WSLH started analyzing composites, 88% have been less than 0.05 ng/L
- Currently 7 sites request methylmercury in precipitation
  - MN16, MN18, MN27, TN11, TN12 (seasonal), and NJ30
- Methylmercury is very low in MND precipitation, and easily affected by contamination (pollen/plant, insect/animal)
- For the summer and fall of 2021 only, sampling has changed from monthly composite to weekly individual (volume permitting) to control for the effect of debris and contamination
  - Aliquot taken from samples ≥ 200 mL
- Approximately 30% of the sample aliquots taken have been analyzed
  - 24 samples analyzed to date (of 70 collected so far)
- Results
  - The primary contaminants in this data set included pollen/plant and animal/insect contamination
  - All samples contained either pollen/plant and/or animal/insect expect M2102475, which only contained dirt/soot/ash.
  - Methyl accounted for <2% of the total measured mercury in all samples
  - 75% of the samples analyzed measured at or below the method detection, 0.1 ng/L (Instrument DL ~0.02 ng/L)
  - All samples which were free from debris/contamination were below detection limits
- Methyl Subsampling Problem?
  - Preliminary results show Mercury is sticking to the bottle walls even with acidification (MDN or USEPA 1631)
  - Appears to require oxidation with BrCl to recover Mercury from bottle walls
  - Oxidation destroys Methylmercury
  - Is subsampling for Methyl (10%) biasing total mercury values high?
  - Are Methyl subsamples biased low due to mercury on walls?
  - Is historically low concentrations related to limitations of aliquoting?
- Methylmercury Discussion
  - More testing is required in light of results indicating surface adsorption
  - Additional data from this year's non-compositing study is needed
  - Working with surface water sampler to collect samples directly into distillation vessels, parallel to traditional samples
  - Will seek input from others (especially Eric Prestbo)
  - Consider dual chimney for methylmercury sites
  - Should we stop aliquoting altogether while more work is done?
  - If we continue compositing, should be implement any changes?

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

15:23:04 From Greg Wetherbee to Everyone:

Like I typed in the chat yesterday with no reply, the stability study has to be done with independent, single-chimney N-CON samplers with 1 sampler removing the spiked sample weekly and the 2nd (3rd, etc.) sampler being collected bi-weekly or monthly. You have demonstrated that the subsampling protocol does not work due to sorption of Hg prior to oxidation. Christa Dahman: Seems like stability is okay, but more work needs to be done. Chris Worley: is there an alternative bottle that doesn't have the sticking issue? Christa Dahman: Checking into other options. Winston Luke: do we need any motion concerning this? Christa Dahman: need to meet with all 7 sites involved with this effort. Winston Luke: before proceeding with any additional steps, let WSLH talk to the 7 sites then we revisit during Spring 2022 meeting. Jamie S.: we need to be careful in deciding this measurement is not important.

Nomination of NADP Secretary (Greg Wetherbee)

- Nominated and approved Mike Bell as the next Secretary

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

15:57:27 From Linda Geiser to Everyone:

Ryan et al--re Spring Hybrid Meeting. USFS will require meetings management for this meeting because of the registration fee and the travel. That means it will be necessary to start right away to have permission by April. Being that no travel budgets have been set up for FY 22 yet and we will not even start to go back to our buildings until January at the earliest (more likely March), I do not foresee that FS employees will be able to attend in person. Currently only fire-related travel is allowed. So a hybrid option without a fee is my best suggestion to retain FS participation.

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

Chris Rogers moved to adjourn the meeting. Mike McHale seconded. Motion passed.

Attendee List

Abby Carr	abigail.carr@slh.wisc.edu
Amanda Cole	amanda.cole@ec.gc.ca
Amy Mager	amy.mager@slh.wisc.edu
Andrew Johnson	apjinme@gmail.com
Anita Rose	anita.rose@usda.gov
Anne Marie Macdonald	annemarie.macdonald@ec.gc.ca
Anne Rea	rea.anne@epa.gov
Camille Danielson	camille.danielson@slh.wisc.edu

Cheryl Sue	cheryl.sue@ec.gc.ca
Chris Rogers	christopher.rogers@woodplc.com
Chris Worley	chris.worley@slh.wisc.edu
Colin Kelly	colin.kelly@slh.wisc.edu
Colleen Flanagan Pritz	colleen_flanagan_pritz@nps.gov
Dana Grabowski	dana.grabowski@slh.wisc.edu
David Gay	dgay2@wisc.edu
Donna Schwede	schwede.donna@epa.gov
Doug Burns	daburns@usgs.gov
Emmi Felker-Quinn	emmi_felker-quinn@nps.gov
Eric Hebert	eric.hebert@ee-ms.com
Gary Yip	gary.yip@ec.gc.ca
Greg Beachley	beachley.gregory@epa.gov
Greg Wetherbee	wetherbe@usgs.gov
Hanna Mesraty	hanna.mesraty@gmail.com
Jamie Schauer	wslhdirector@slh.wisc.edu
Jason Lynch	lynch.jason@epa.gov
Jason O'Brien	jason.obrien2@canada.ca
Jim Hermanson	james.hermanson@wisc.edu
John Jansen	hojoman474@gmail.com
John Offenberg	offenberg.john@epa.gov
John Walker	walker.johnt@epa.gov
Kat Ko# NPS	katherine_ko@nps.gov
Katie Blaydes	kblaydes@wisc.edu
Kevin Mishoe	kevin.mishoe@woodplc.com
Kristi Morris	kristi_morris@nps.gov
Kulbir Banwait	kulbir.banwait@ec.gc.ca
Linda Geiser	linda.geiser@usda.gov
Marcus Stewart	marcus.stewart@woodplc.com
Maria Jones	maria.jones@ee-ms.com
Martin Shafer	martin.shafer@slh.wisc.edu
Mark Olson	mark.olson@slh.wisc.edu
Melissa Puchalski	puchalski.melissa@epa.gov
Mike Bell	michael_d_bell@nps.gov
Mike McHale	mmchale@usgs.gov
Nicholas Levitt	nicholas.levitt@slh.wisc.edu
Nichole Davis	nichole.davis@slh.wisc.edu
Ralph Perron	ralph.perron@usda.gov
Richard Grant	rgrant@globaliedu.org
Richard Tanabe	richard.tanabe@slh.wisc.edu
rick Haeuber	haeuber.richard@epa.gov
Robert Larson	boblarson57@gmail.com
Rodolfo Sosa Echeverria	rodsosa@unam.mx
Ryan McCammon	rmccammon@blm.gov
Selma Isil	selma.isil@woodplc.com

Timothy Sharac sharac.timothy@epa.gov
Winston Luke winston.luke@noaa.gov
Zac Najacht zachary.najacht@slh.wisc.edu