

2020 NADP Virtual Fall Business Meeting: Network Operations Subcommittee
Meeting Minutes
November 4, 2020

CAL Update (Chris Worley/Amy Mager)

- Bag rollout almost complete: as of 12/22, 66 sites have made the switch.
 - By the end of January 2021, the bag conversion will have been completed.
- Talking about doing a virtual audit.
- Camille will be doing a system audit this December.
- Bag comparison at Eagle Heights:
 - **Action Item:** Mark will present results of the bag data comparison at the 2021 Spring NADP meeting.
- COVID-19 Update: sites temporarily closed during the pandemic: NTN=14%, MDN=21%, and AMoN=6%.
- IL-11 archive will get transferred to WLSH (COVID had delayed this from happening earlier this year).
- Bag Transition: will have 9 weeks of supplies for each site (as opposed to 6), shipping less frequently and in smaller boxes means shipping costs will decrease.

Questions/Answers/Comments

From Winston Luke to Everyone: 12:20 PM

Chris, has there been discussion or testing of using tape to seal the lids of the glass jars, as they do in the Hg passive samplers? This may further reduce the diffusion of NH₃ into the jar and onto the sampler.

A: No, haven't tried it. Good suggestion to try bucket test again.

WL: Adhesive tape.

CD: Not concerned, tape might be easier.

MS: Always have the option to use a bag.

From Greg Wetherbee to Everyone: 12:22 PM

For AMoN DQOs - Rhetorically, does the bias from the dipped cores affect spatial and temporal trends? In other words, we should compare the bias from the dipped cores to the variability at sites with the same levels of NH₃.

A: Don't know, need to look at. A lot of concerns that need to be addressed.

CD: How much variability is okay? Cost/benefit. Reuse of bodies a slight cost decrease. Too many uses, they fall apart.

From Camille Danielson to Everyone: 12:22 PM

Exactly! We need to know what level of variability is ok!

From Margaret to Everyone: 12:23 PM

Hi Chris! When you were discussing the potential cost savings with reusing parts of the AMoN samplers I started to wonder if there is also a significant difference in waste produced if we are able to reuse them? Are the bodies currently recycled? Would reusing the bodies require a lot more resources to clean/prep before deploying?

A: Bodies are currently not recycled because of polyethylene. Washing protocol. Weigh the effort using v. time spent deploying new ones. If cores can be reused, cost savings...will be a lot.

From Greg Wetherbee to Everyone: 12:34 PM

I'm really not going to argue about bags anymore. However...to be clear, you did not include the original NADP bags in the more recent experiments with the Canadian bags, right? Oh yah! And, you are still in the laboratory not in the field. Where are the comparisons between bags and no bags from Eagle Heights?

A: Data from comparison from PE bags compared to VINVins bags. A lab exercise. Can provide additional data. MO, bags v. buckets...Degauge bags were used, Degauge then switched to VINVins bags, we have the insitu measurements. Will present results at Spring meeting

From Cari Furiness to Everyone: 12:41 PM

Sorry, Ryan - I directed my question to Melissa since she was involved in the initial 12-point plan to develop AMoN network. My question was in regard to the question of why 14-day in-field sampling duration was chosen, and I don't recall. Question was: Weren't there some loading over time studies done during AMoN SOP development?

From Melissa Puchalski to Everyone: 12:44 PM

Cari, I don't specifically remember testing the loading but Mark Rhodes might have performed some tests at Bondville looking at 7 consecutive 1-day samples versus 1 week after AMoN was established. Selecting the 14 day sample was probably to align with the Tuesday - Tuesday schedule used by CASTNET and NTN and cost savings having 26 samples annually instead of 52 Looking at Chris W's 2 day versus 7 day sample - I wonder if the additional handling resulted in the 2-day sample bias (high)

HAL Update (Mark Olson)

- The move to WLSH has been completed.
- 2019 QA report is done.
- Combined the HAL and CAL QA plans.
- Prep and analytical SOP's completed.
- Remodeling of HAL lab almost complete.
- MDN sample coding: trends down for A (no flags) and B (only valid flags).

- Ongoing QA analyzed for Total Hg
 - Monthly checks (Results should decrease after a change in labs)
 - Acid Bath
 - Acid Crock
 - Monthly checks (Initially high sample train; initiated Type One water testing; problems appeared to be related to source water)
 - Type One Water
 - Sample Blanks
 - As needed checks
 - Bottle blanks
 - Preservative Acid
- MDN Improvements: New prep. Lab (HM 511) hope to occupy 12/2020.
- MDN Field QA
 - USGS System blank samples...looking for background contamination, found small differences (Field Blank-Source Water) less than 1 ng/L.
 - MDN Duplicates...using dual N-CON chimney: differences not too bad.
 - WI06/WI31 Spike Recoveries
 - Ran test from 6-9/2020.
 - BrCl in spike resulted in 80-120% recovery.
 - No BrCl in spike resulted in a decrease in recovery.
 - MDN Evaporation Study
 - A previous study indicated a sample loss of 10-60% (in one week) with the ACM cooling fan on.
 - Performed a side-by-side study at Mark Olson's farm this past Summer using two ACM's: one with a cooling fan, the other without.
 - Results showed that the ACM with the cooling fan experienced a less than 1.6% evaporative loss after 3 weeks.
 - Theory: the change in the seals from the thistle-2L bottle to thistle-PETG bottle may account for the decrease in evaporation (e.g. from flat glass seal to a tapered seal).
 - Found 5 sites that experienced evaporation issues: ME00, MN16, SD18, WY08, and MO46. Will continue to monitor these sites and contact the site operators to determine what the issue could be (more training needed?).

Questions/Answers/Comments

From Greg Wetherbee to Everyone: 01:26 PM

Re: BrCl, Are you suggesting that BrCl should be in the preservative? It has been a while to say the least, but I recall that it was the N-CON that had the larger problem because the fan pulls air right at the location of the bottle-thistle tube connection. I thought that ACMs were better than the N-CONs.

A: Go Back and check the video. (Small amount of BrCl).

From Me to Everyone: 01:31 PM

How far from the collectors was your thermometer measuring ambient air temperature?

From Greg Wetherbee to Everyone: 01:32 PM

Ryan: Temperature monitoring inside the collectors is part of the QC for MDN.

From Greg Wetherbee to Everyone: 01:33 PM

I'm convinced that the PETG bottle connection to the thistle tube is much better, and it probably does solve the problem. Great work, Mark!

From Richard Tanabe to Everyone: 01:33 PM

The NCON sampler was fine and performed better than ACM (NOS minutes Spring 2011)

GW: Thought the problem with the N-CON was that the fan is right at the thistle tube-bottle mouth interface. The new bottle will help solve this issue.

MO: Agreed. Maybe should look at this during winter because the heater is next to fan.

Drying room for soils group, would like to use those rooms for this effort.

GW: Is there another oxidant that could be used instead of BrCl?

GW: Years of sample loss...what do we do with the data?

MO: Ability to adjust data would be tough. Will look into this further.

Total Phosphorous & Total Nitrate Sampler Design (Secondary sampler evolution) (Chris Worley)

- May 2019 Strategic Initiative driving force for this effort:
 - Future studies of organic nitrogen and phosphorus
 - Sustainability of NADP networks.
 - Fill gaps and new funding opportunities.
- Added a collector on the N-CON bucket.
 - UW-Madison Engineering aided in the design.
- Prototype sampler: 2-inch inlet with Type 1 PVC pipe (5-140F operating temperature) with a 250 ml bottle attached to the bottom of PVC pipe.
 - Deployed at the Eagle Heights site.

- Considering adding an overflow hole to the PVC pipe.
- Next Steps:
 - Evaluate the sampler material.
 - Test for cross contamination.
 - Site operator feedback (pilot study?)
 - Analytical method validation.
 - Determine shipping/prep. and analytical costs.

Questions/Answers/Comments

From Cheryl Sue to Everyone: 01:46 PM

What happens with overflow?

A: Considering overflow hole.

From Camille Danielson to Everyone: 01:47 PM

Would they send the sampler and the bottle back so we can clean the sampler?

A: None.A: Yes, the initial plan would have complete clean sampler shipped out to sites

From Jason O'Brien to Everyone: 01:49 PM

What about the collection of snow?

A; From Richard Tanabe to Everyone: 01:51 PM

If the funnel was filled with snow, the sampler would be capped and brought back to the lab to melt.

From Martin Shafer to Everyone: 01:50 PM

Given previous studies on org-N loss from NTN samplers, the collection bottle will need to be pre-charged with acid.

From Mary Lynam to Everyone: 01:51 PM

Can you put vapor lock into the cap of the bottle to prevent evaporation of acid?

A: MO: Have to widen the sampler, good idea, however.

From Mary Lynam to Everyone: 01:53 PM

Univ of Michigan has used vapor locks for Hg in precip collection.

From Martin Shafer to Everyone: 01:52 PM

PVC is subject to acid attack. will need to keep this in mind.

From John Walker to Everyone: 01:52 PM

For estimating bulk ON, is the thought that ON would be calculated as TN from the new collector minus $\text{NH}_4 + \text{NO}_3$ from the bucket?

From Chris Worley to Everyone: 02:02 PM

John, I think we could use the acidified sample for the NH_4 analysis as well (assuming enough volume).

A: Yes.

MS: [There should be] collection efficiency comparisons.

From Martin Shafer to Everyone: 02:03 PM

If your sulfate deposition suddenly jumps, then a vapor lock will be essential.

From Mary Lynam to Everyone: 02:04 PM

I think the white collar is Teflon and this would get around the PVC worry as expressed by Marty

From John Walker to Everyone: 02:06 PM

That would be my recommendation, Chris. Using the bucket for the inorganics would certainly minimize cost but, as mentioned, small biases in the inorganics could impart large biases to ON estimated by difference. NO_3^- is usually stable in the bucket but I would suggest using NO_3^- from the new collector as well for ON determination.

Update on Hg Passive Pilot Study (Sandy Steffen)

- Comparison results indicate MerPAS samplers showed excellent linearity for samples taken. Hope to get 2021 Q1 samplers out soon.

Update on Dry Side Bucket Study (Janice Brahney)

- Got a 5-year NSF grant to continue the work.
- Several analyses are ongoing.
- Data suggest a seasonality to trends data.

Questions/Answers/Comments

DG:? Send whole set back to Janice.

GW Total P in Lab, use XRF Sum of those sequential sections.

We have a Lachat analyzer as well.

Update on Microplastics Study (Janice Brahney)

- 11 monitoring sites.

- Microscope analyses showed the microplastic composition comprised of nylon, polyester, and bottle labels averaging 10-30 micrometers in diameter.
- Dry deposition analyses suggest that lighter particles travel farther. While large cities contribute to this issue, vehicles creating airborne dust from roads [may be] the primary culprit for long range transport.

Questions/Answers/Comments

SS: Locally wet dep/ dry dep higher in atmosphere. Have you looked at areas outside the US?

A: Finer particles plastics less dense than minerals, so travel farther. Not many studies have used global models to answer questions. Bulk deposition makes this difficult to analyze. We do think that fine plastic particles can travel very far.

GW: Why look at plastic deposition to begin with?

A: We don't know how these particles affect the environment.

PO Update on Utilizing Site Survey Results (Mark Olson)

- Sending the surveys (weblink) out with the monthly reports to aid in addressing field issues.
- Conducting monthly meetings with EEMS.
 - EEMS performs audits on a 4-year rotational basis.
- Will be tracking changes with our site operators better.
 - Plan to send out a welcome package to ensure a smooth transition from the old to the new site operator.
 - Also going to start having quarterly training seminars to assist the site operators with issues.
- Paying particular attention to Box 4 on the FORF to better address current problems at sites.
- Trouble ticket will be generated to gain efficiency in addressing site issues.
- Hiring 2 PT employees: one for outreach, one for the NED.
- Supplies at the NED are low, will be addressing this with the help of the PT NED employee.
- Update of NADP website: project kickoff week of 11/9 with the DoIT folks.
 - Going with Wordpress and want to make our site mobile-user friendly.

Questions/Answers/Comments

From Andrea Blakesley to Everyone: 03:23 PM

I have some ideas how the new site support web page could be designed to be more user-friendly for newer site operators, when the web site is revised. Feel free to email me if you'd like an experienced site operator on the review team.

From Camille Danielson to Everyone: 03:32 PM

We also want EEMS to focus on what is important to make the most impact from their visits

Siting Criteria Workgroup (Tim Sharac)

- Many sites not meeting our siting criteria.
- Purpose of this group is to find ways to aid the sites in meeting the proper siting criteria.
- One objective will be to examine the debris counts in samples and then relate those to sites to determine if the sites need to adjust to obtain the correct siting criteria.

Questions/Answers/Comments

GW: Next steps?

A: Looking at debris and QR codes A/B/C proportion of data completeness. NTN sites co-located or not with CASTNET sites. Want to be co-located.

GW: Should we add flag to data that says that site doesn't meet certain SC?

DG: Follow-up with sites that fail keep on them until they pass SC.

CD: Wrapping this into the DQO's.

From Andy.Johnson to Everyone: 03:36 PM

Is the > 1 meter criterion applied to above the bucket / collector sampling inlet, or above the ground?

From Eric Hebert to Everyone: 03:38 PM

Andy, it is based on from the mounting of the collector. we have discussed changing it based on the opening of the collector.

Low-Power Collector (Bob Larson)

- 28 NTN sites higher than 2000 meters are solar powered.
 - Problem because harsh winter conditions create power issues with those sites.
 - Ideas to address this issue: use smart solar controllers, use telemetry to monitor site power conditions while integrating hourly weather data/forecasts to aid in adjusting site power needs, and switching to an ACM battery or a LiFePO₄ battery.
 - Advantage of LiFePO₄ battery is better efficiently and they last longer.

- Low end operating temperature of -20 C is an issue.
- Would like to use some form of insulation to address that issue.
- Progress so far: Bob has written Python code to obtain weather information.
- Select several NADP locations for data comparison of precipitation missed or caught and hours of energy savings.

Questions/Answers/Comments

From Camille Danielson to Everyone: 03:43 PM

Is 2-way communication for telemetry going to be expensive?

A: None

From Richard Grant to Everyone: 03:44 PM

Minute by minute forecast is not likely to be useful

From Timothy Sharac to Everyone: 03:46 PM

Battery chargers can control the charge rate without weather forecasts.

From Me to Everyone: 03:47 PM

Did you look at using NWS forecasts when you did your initial research?

I love Raspberry Pi's, I have several here at the house.

From Chris Worley to Everyone: 03:47 PM

Any impact of telemetry on battery energy consumption?

From Richard Grant to Everyone: 03:48 PM

If Cloud service or internet needed, these are not available for many places- use satellite instead?

From Richard Grant to Everyone: 03:52 PM

WI gets the NAOAA weather info directly and stores it- just need to get their stored data.

From Timothy Sharac to Everyone: 03:54 PM

Why not use L16 deep-cycle batteries and skip the weather forecasts? Two-L16 batteries should be enough to keep up with numerous cloudy days in a row. Yes, they are very heavy. But, won't need weather forecasts/telemetry to monitor when to store up energy.

From Robert Larson to Everyone: 03:55 PM

I agree - not much use for minute by minute forecast

Ryan - Yes - there are lots of choices of data, but they vary greatly in how easy the data is to work with.

From Robert Larson to Everyone: 04:01 PM

Tim - yes, the charge controllers can manage the batteries fine. The forecast is useful for controlling energy consumption by not powering the sensors when they are not needed.

From Timothy Sharac to Everyone: 04:03 PM

I've been using these L16 batteries <https://www.usbattery.com/products/6-volt-batteries/us-116hc-xc2/> since 2016 to run an off-grid cabin - primarily weather station operations when we're away. We have 4 to run a weather station + Mifi device year-round, plus run a well pump and other power needs when we're there.

From Robert Larson to Everyone: 04:06 PM

Chris - telemetry equipment consumes much less than the sensors, and only need to be powered a few minutes an hour

Jim, yes we can reboot.

USGS Next Generation Water Observing System at NY68 (Mike McHale)

- NGWOS instruments were installed and are operational at the NY68 Biscuit Brook site. They include soil moisture and temperature and ET measurements.

Nomination of NOS Chair (Melissa Puchalski)

Melissa made a motion to nominate Tim Sharac to be our new Secretary. Ryan seconded, and the vote passed.

Meeting End

Meeting Attendees

Amanda Cole
Amy Mager
Ana Alarcón
Andrea Blakesley
Andy Johnson
Ann Mebane
Anne Marie Macdonald
Bret Schichtel
Camille Danielson
Cari Furiness
Catherine Collins
Cheryl Sue
Chris Rogers
Chris Worley
Christa Dahman
Colin Kelly
Colleen Flanagan Pritz
Dana Grabowski
David Gay
David Schmeltz
Donna Schwede
Doug Burns
Dr. Rodolfo Sosa
Ed Eberhardy
Eric Hebert
Eric Prestbo
Eric Uram
Gilberto Fuentes García
Greg Beachley
Greg Wetherbee
Janice Brahney
Jason Lynch
Jason O'Brien
Javid Nathaniel
Jim Hermanson
John Jansen
John Offenberg
John Walker
Katie Benedict
Ken Brice
Kenny Yan
Kristi Morris
Margaret Johnson

Maria Jones
Mark Olson
Martin Shafer
Mary Lynam
Melissa Puchalski
Mike Bell
Mike McHale
Muge Yasar
Na Zhang
Naomi Tam
Nathaniel Javid
Nichole Davis
Pablo Sánchez
Richard Grant
Richard Tanabe
Rick Haeuber
Robert Larson
Ryan McCammon
Sandy Steffen
Selma Isil
Timothy Sharac
Tom Butler
Vid Grande
Winston Luke
Zac Najacht