

NOS Sub-Committee Meeting

Memphis, TN

April 20, 2010

1. Approval of Minutes from Fall 2009 Meeting in Saratoga Springs, Chris Rogers

Jason Karlstrom moved to approve

Bob Brunette seconded

Motion carried

2. Continuation of Discussion on Dual-Chimney NCON, NCON Bucket

Dual-Chimney NCON:

- Additional field testing is requested that is more challenging than WA18.
- It was questioned who would pay for the future testing.
- It was questioned whether the trace metals data needed to be compared against the aerochem trace metals data.
- A proposal was presented to have the Penn St sites switch over to the dual NCON collector, and have their data be available only to them. In the event of future approval, their data can then be converted to official data retroactively.
- It was noted that the inclusion of the Trace Metals network as a NADP product would make the inclusion of a more attractive option.
- Bob Brunette noted the HAL could pay for the analytical costs of future testing.
- It was noted that because this is either slightly new or a modified version of the single chimney NCON, then only a year of analysis would be needed.
- The discussion was to put together a plan for future sampling of the Dual Chimney collector, for a motion to be presented on 4/21/10.

NCON NTN Bucket collector:

- The VT site will continue to sample the collocated collectors through September.
- There are approximately 15 months of data from the VT site and eight months of data from IL site.

Motion: The CAL will re-start sampling of the collocated NCON Bucket Collector at IL11 for one year.

Moved by Mark Nilles

Seconded by Greg Wetherbee

Motion carried

3. USGS QA Report, Greg Wetherbee

MDN Programs:

- HAL maintained consistent performance during 2009, clean blanks, low variability, slight negative bias (always been the case)
- System Blanks indicate reduced Hg contamination in MDN samples compared to previous 3 years
- High recoveries of system blanks could be due to mistakes by site operators selected for blind audit samples.
- Blind Audit program continued: Site operator submits fake sample with known concentration, HAL showed a slight negative bias

NTN Programs:

- CAL maintained consistent performance during 2009, clean blanks, low variability, low percentage of concentrations outside of statistical control
- CAL results for standard reference water samples were very close and always within one sigma
- NTN Field Audit showed that the maximum analyte loss was low.
- Contamination appears to be down for NTN samples when compared to previous 3 year period

Looks like things are going well in both networks.

4. Mercury in Litterfall Data Report, Marty Risch

Why collect Hg in litterfall data?

- MDN and AMNet don't fill in all the gaps.
- Litterfall can give you one measure of Gaseous Elemental Hg that accumulates in a forest canopy.
- Also missing would be throughfall.
- Hg Dry deposition is highest in forest vs. a non-forest landscape.
- New Hg in the forest floor is from litterfall.
- Litterfall is an important source of organic matter to streams

Methods for Pilot Study:

- 23 sites in Northeastern US
- Sites are predominantly deciduous forest, several mixed, and one coniferous
- Sampling kit shipped to operator in two cartons
- Passive sampler consisted of 4 boxes

- Study Plot was a 16 by 16 plot. Locations within the plot generated randomly

Quality Assurance Data

- Analysis of replicate samples
- Analysis of 4 samples per site
- Intra-season variability was studied (concentration was higher in first half of autumn vs. second)
- Inter-season variability was studied (inter-annual variability of concentration wasn't that much, though sample catch was higher)

Implications

- Developed a workable method for passive litterfall sampling
- Potential exists for long term database of litterfall Hg concentrations at MDN sites
- Need to control variance in sample catch or substitute different values for litterfall mass per area
- Approach is applicable to deciduous; however, coniferous might need more work.

- It was noted that litterfall that rests on the forest floor for a few weeks could lose Hg to volatilization. Marty noted that they could also actually accumulate Hg by being exposed to wet deposition while it sits.

5. Bottle Leaks, Mark Rhodes

- Bottle leaks lead to loss of pre-charge (MDN), less sample to analyze, less sample to archive (NTN), potential for contamination
- NTN sample bottle boxes coming back in poor condition
- NTN percentage of leaks is rising, MDN percentage has high variability (no discernable trend), AIRMoN no leaks
- AIRMoN vs. NTN procedures were compared to highlight why AIRMoN bottles don't leak
- Does taping with Parafilm help prevent leaks?
- Various tests were performed: ultrasonic bath, driving around, and shipping around the country.
- Results show that taping did not prevent leaks on a reliable basis
- More results to come in the fall meeting (currently testing rubber bands)

6. Bromide Data for Selected 2001 Archive NTN Samples, Greg Wetherbee

- Bromide is often present in IC Chromatogram for NTN samples
- Methyl Bromide is a restricted compound in Agricultural chemical applications, use has dropped.
- Analyzing archived NTN samples for Bromide might show a downward trend in concentration
- Samples analyzed were analyzed for the period of May to Sept 2009

- Bromide leaches out of NTN buckets, samples were blank corrected
- Time trend of Bromide concentrations showed peaks around July 1st, however, data is still not complete enough to clearly identify a trend
- Now that the methodology is correct, and seasonality could be identified, future testing should be more conclusive

7. Belfort/E-Gage Preliminary Results, Mark Rhodes

- Belfort Rain gauge Model 600 was tested for possible inclusion in NADP
- Design: Bucket floating on a metal ring
- 4 rounds of bench testing:

As first received
 With pre-charge
 After returned to Belfort for fixing
 After visit by Belfort Tech

- Results were not promising until after Tech visit
- All tests in triplicate using both Belfort weights and volumes of water
- Current requirement is high (0.25 amp no heater, 2 amp with heater)
- Deviations from expected response were not consistent across triplicate tests due to vibrating wire gauges responding unexpectedly at random times
- Water Testing had worse response for Belfort than with weights
- Pluvio 2 and NOAH IV were also tested similarly and performed very well, better than Belfort e-gauge
- Pre-charge is specified by the manufacturer (oil or antifreeze)
- Hardware issues: alignment of vibrating wire gauge is very critical and wiring is a very tight fit
- Because bucket is floating on a suspended ring, wind affects the results significantly
- It was questioned if we should proceed with field testing.
- It was noted that the gauge is attractive at its price; however, if it doesn't work correctly it might not be worth effort.
- The decision was not to proceed with field testing of the Belfort Rain gauge Model 600

8. MDN Collector Evaporation Tests, Mark Rhodes

- Can't say how much of evaporation is occurring with all the samples. However, we can look at samples with less than 20 mL.
- ACM collector appears to be showing more samples that have excessive evaporation than the NCON collector
- Testing at PO tested ACM vs. NCON keeping collector closed. Both good lid seals and bad lid seals were tested
- Lid seals did not appear to have an effect on the lid seal for the NCON, however, might play a role in the ACM, though only a few bad points might be throwing off the ACM numbers

- Further tests will be performed.

9. Evaluation of 7 and 11 grid sensors for Collocated ACM, Greg Wetherbee

- Previous data presented was rain only. This presentation includes snow data
 - 11 grid sensor cycles more and is open more during rain events
 - 11 grid sensor cycles more and is open more during snow events
 - 11 grid sensor opens more often, sooner, and stays open longer
 - 11 grid sensor shows a 5% higher hydrogen ion concentration than the 7 grid, and even higher at the low end of precip volume
 - Samples collected using 11 grid sensor are slightly higher for specific conductance
 - Though the 11 grid appears to be more sensitive, retrofitting might not be worth it, as the chemistry wasn't affected much.
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- It was noted that the results might be biased due to motorbox variability.
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- It was noted that it might be more worthwhile to explore retrofitting with an optical sensor.

Motion: NOS does not recommend that we retrofit NTN ACM collectors with 11 grid sensors.

Moved by Kristi Morris

Seconded by Gary Lear

Motioned carried

10. A discussion on how to best cite and archive small studies presented in NADP meetings.

- This reinforced the idea that there is a need for quality minutes.
- Also, archiving the presentations with copies of the minutes was mentioned as an option.
- No action items were put forth.

Meeting Adjourned for the day at 4:30 pm on 4/20/10.

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11. Training Course Report, Jason Karlstrom

- The NADP Site Operator Training course was held at the Peabody Hotel in Memphis, TN on 4/18 and 4/19.
- The list of attendees, materials covered by the course, and operator critiques and comments were presented.
- The majority of the responses and comments were positive.
- No training course will be performed in conjunction with the Fall Meeting in Lake Tahoe.
- The HAL, CAL, and Program Office are exploring other options:

Regional Training Course in Denver

Returning the training course to Champaign and Seattle

Online options

- It was suggested that various NADP Sponsoring agencies have facilities that could be used for the training course if regional movement was used.

12. NED Report, Matt Layden

- Motorboxes: MDN sent out a significantly lower number of motorboxes than NTN (percentage wise).
- Majority of motorboxes are sent in the winter. MDN, across the board, sent out fewer parts
- Electronic rain gauge and NCON collector parts are available

13. Distance Criteria for Backup Rain gauges, Roger Claybrooke

- Currently, the max distance for use of back-up data for daily precip values is 30 m.
- If a back-up rain gauge is farther than 30 m from the collector, it can only be used for a weekly total (this the case for the Bondville site).
- Roger questioned whether the 30 m limit should be extended to 100 m or farther.
- It was noted that NOS approved a document that there is an SOP that outlines the distance, and any change would have to be reflected in that document.

Motion: Table the discussion until the Fall Meeting when a specific distance requirement can be presented.

Moved by Eric Hebert

Seconded by Mark Nilles

Motion Carried

14. Status of the Site Survey Program, Eric Hebert and Maria Jones

- EEMS is in the third full year of running the site survey program.
- 101 collectors were surveyed in 2009 (72 NTN, 26 MDN, 3 AIRMoN)
- 70% of gauges at sites that required windshields had them installed
- During survey, EEMS records sensor temperature (active and inactive)
- Belfort gauges were checked for calibration, overall they were pretty accurate.
- Adjustments improved accuracy after the surveys
- E gages were very accurate
- Eric suggested that when a new e gauge is being installed, an attempt to improve the siting of the gauge (i.e., make sure gauge is level, proper distance, proper wiring)
- EEMS performed an internal audit of Entry of Field Data. Overall, there were mistakes in 0.69% of the records entered. While this is good, they hope to improve on their data entry process
- EEMS sends a response questionnaire to the site operators after a survey. These reports are made available to the QA officer.

15. CAPMoN “ I can’t download my ETI data”, Richard Tanabe

- What to do when you cannot download data from the ETI?
- Richard developed an adapter that can be attached to the Bluetooth Dongle that will show if it has power and if the PDA is communicating to it.
- Currently, the site operator has to remove the outer shell of the rain gauge to check this.
- The cost to make the single adapter was \$68. It could be cheaper if made in bulk.
- They will soon be deployed at CAPMoN site, and update will be given in the fall.

Motion: NADP will request ETI to modify the rain gauge design to add two external LEDs, one for Bluetooth function and one for power, and to provide a retrofit kit for existing NADP gauges and a price for it.

Moved by Mark Nilles

Seconded by Matt Layden

Motion carried

16. Operational Status of CAPMoN, Dave MacTavish

- A few new sites have been added, a couple of new sites have been proposed.
- Still need more in the west.

- Total Gaseous Mercury is being run at four sites, all collocated with MDN, one with AMNet.
- Methyl Hg will be added to 4 MDN sites for one year.

17. Old Business Items (Dual Chimney NCON)

- Three motions were put forth:

Motion: To further evaluate the dual chimney N-CON collector, advocates need to produce data comparing the dual chimney N-CON with an approved MDN collector (either ACM or single chimney N-CON) for an additional two sites for one year (two site-years). Sites should represent different environments compared with the current site-year produced at WA18. Suggested locations are WI, PA, VT99, or a location in the SE. Statistical analyses of the data sets needs to be produced and presented to NOS for all three site-years. The NOS chair and NADP QA Manager will coordinate to prepare a study plan and will present an update at the Fall meeting. The collector will be operated with the snow roof in place throughout the testing period.

Moved by Greg Wetherbee

Seconded by Scott Dossett

Motion carried

Motion2: Effective immediately, State of Pennsylvania (or any other site sponsor) may purchase and operate a dual chimney MDN N-CON collector as a research site with the understanding that data produced from the site will be “grandfathered” in as network data once (if) the collector is approved. NADP data products should be re-created to reflect this change, if the collector is approved for network use.

Moved by Scott Dossett

Seconded by Bob Larson

Motion carried

Motion3: Effective immediately, the use of boots made of Tyvek and Gore Tex (any color) is disallowed for use with NTN ACM collectors. Any future boot considered for use in the NTN network must be tested for possible contamination before deployment to sites. Any site currently using a boot should remove the boots as soon as possible. There will be no effect (i.e., invalidation) on data collected from NTN ACM collectors operated with boots.

Moved by Scott Dossett

Seconded by Jason Karlstrom

Motion carried

18. Proposal for Neutron Activation Analysis of NTN Filters, Greg Wetherbee

- Just a couple of comments made due to data being too preliminary.

- Greg would like to get some NTN filters to test for neutron activation.
- More to follow at the fall meeting.

19. Comparison of CAPMoN and NADP Data for 2005-2008, Greg Wetherbee

- Comparing precipitation depth for the two sites (CAN5 and PA15) shows that CAPMoN collects a little more volume than NTN
- Data showed that CAPMoN concentrations were slightly higher than NTN
- Statistical analysis show that data comparability is getting better between the two networks, however more variability in the data for Hydrogen ion
- Median CAPMoN concentrations are higher than NADP except for Hydrogen ion, due to equipment and protocol differences: Sensors, sample frequency, filtration of NADP
- Larger concentration differences
- If Environment Canada recompiles daily data into weekly ppt-weighted values, USGS will re-do the stats.
- Different results/conclusions might be obtained
- Need to determine best way to publish
- Need to compare annual ppt-weighted mean concentrations and annual deposition values
- Mark noted that AIRMoN samples had a better correlation with CAPMoN than did NTN

20. USGS/PO MDN Sample Train Study, Greg Wetherbee

Phase 2 of the Sample train study:

- Comparing Hg adsorption between NCON and ACM sample trains.
- Is there a difference? No
- The HAL sends three bottles to USGS (two sample bottles plus 100 mL of 1% HCl).
- 5 ACM and 5 NCON sites pour rinse bottle through sample train after a week with precipitation.
- There was a small amount of adsorption to ACM and NCON sample trains.
- Both rain and snow events showed a similar amount of Hg adsorption between the types of sample trains.

Meeting was adjourned at 10:15 am on 4/21/10.