

**Network Operations Subcommittee (NOS) Meeting Minutes**  
**2017 NADP Spring Meeting**  
**April 25-26, 2017**  
**Louisville, Kentucky**

Officers: NOS Chair: Gregory A. Wetherbee (USGS)  
Vice Chair: David W. Schmeltz (USEPA)  
Secretary: Richard H. Tanabe (Environment and Climate Change Canada)

**April 25, 2017**

Greg Wetherbee called the meeting to order at 13:35.

1. **Approval of minutes from Fall 2016 (Santa Fe, NM) meeting** - Greg Wetherbee  
Motion: Mark Rhodes; Second: Mark Olson; Motion carried.
  
2. **AMoN Update** – Melissa Puchalski
  - There are 103 AMoN sites currently
  - Network detection limits are calculated from travel blanks (LOD = mean \* 2 sigma). In 2016 annual network detection limit was 0.12 mg-NH<sub>4</sub>/L. Data below detection limit should be flagged (but still valid); the median of all travel blank samples was 0.09mg/L
  - Quality control – accuracy measured at Bondville with triplicate denuders, precision in 2016 was 6%, good correlation between denuders and Radiellos.
  - Network Precision (mean relative standard deviation) 2016 = 2.8%
  - Calculate uncertainty based on previous 3 years of precision data (triplicates). Ambient data is used to calculate the quartiles. Calculated as median (2\*sigma) for previous 3-years of triplicates for each quartile.
  - Changes to available data online; Average replicates will be replaced with valid data file, invalid data will have “-9” for extract volume, and data will match data in map products
  - NH<sub>x</sub> IMPROVE CSN Study: Duke forest NC and Gainesville AMEC FW
    - Follow up to study by Doris Chen at CSU. Which atmospheric species and emission sources contribute to PM, regional haze, and nitrogen deposition.
    - The goal is to offer an option to IMPROVE/SLAMS operators to get better estimates of NH<sub>x</sub>.
  - Site Characterization Study: Chiricahua, Bondville, Gainesville
    - Develop biogeochemical datasets to improve parameterizations of NH<sub>3</sub> compensation points
    - Assess model sensitivity to surface parameterizations
    - Assess impact of measured versus modeled meteorological inputs
    - Develop methodology for applying diurnal profile to 2 week AMoN sample
    - Met measurements, soil properties, soil chemistry, vegetation properties and vegetation chemistry
  
3. **AMNet Update** - Mark Olson
  - There are 21 sites currently; there were 5 closures: AL03/AL19/GA40/FL96/MI09; three installations: NJ30/NJ54/IL11; potential sites include: Halifax, Boston, Leach Lake, MN, Mexico(2), New York (2)

- Equipment status: analyzers (9), 1130 pumps (10), 1130 oxidized mercury speciation modules (9) and 1135 particulate mercury modules (7)
- AMNet NED Support – Clifty Falls, IN a full speciation system; Bondville, IL a GEM analyzer and eventually speciation; Mexico City has interest in 2 GEM analyzers and Leech Lake, MN install full speciation in July 2017
- There is a 2537X that is available for purchase and would be good for QA studies
- Potential QA Study is co-located 2537X instruments
- Site Visits – 21 in 2016 – included 4 closures and 4 installations, 7 in 2017 to date
- Data availability – all of 2016 is available, password has not been removed; continue with database improvements, adding QR codes
- 2537X analyzer upgrades at MD98, ME97, NJ30, NJ54, NY06, NY43, TW01
- There was a Program Office Review in 2016 with a focus on AMNet by Tim Sharac
- Work continues with the Asia Pacific Mercury Monitoring Network (APMMN); visits to National Central University (Taiwan), APMMN Workshop (Thailand); Asia Pacific Tekran Workshop (Japan)
- Tekran Users Group Meeting II will be held prior to the ICMGP 2017; Focus on improvements to Tekran operations

#### 4. Tekran 2537 A/B/X – Mark Olson, Mark Rhodes

- **Motion 1:** Grant ~~provisional~~ approval to the Tekran 2537X (CVAFS automated mercury analyzer) for use at AMNet sites
- Moved: Mark Rhodes; Second: Mark Olson
- Accept historic data collected using the Tekran 2537X; Update to be provided at Fall 2017 meeting
- Discussion: Should “provisional” be removed?
- Wetherbee: We don’t have control over the sites, we will quantify the bias?
- Prestbo: Tekran, A and B come in for refurbishment or repair, they run on a manifold that also has X sees good agreement, if any bias it was the X was lower (median). 1 B had a negative bias;
- Tordon: ECCC 2537X is higher at all sites; a site will be adding a second X for precision
- Friendly amendment: To remove the word “provisional” from Motion 1 (Greg Wetherbee); Motion carried.
- **Motion 2:** Authorize Program Office to purchase a second (used) 2537X to complete the QA testing.
- Moved: Greg Wetherbee; Second: Eric Hebert; Motion carried.
- Update for Fall Meeting
  1. Assess variability between 2 units;
  2. between an X and an X with speciation;
  3. Assess variability between 2 X units;
  4. Document test results in written report.
- Analyzer differences between A/B/X were presented
- Test data from Mount Horeb presented
- Need to make sure covering the full range and not missing something
- Setup of equipment at Mount Horeb reviewed
- Conc vs conc plots with arbitrarily chosen thresholds of 100 and 50 ng/m<sup>3</sup>
- When AMNet ws accepted, NADP accepted both A and B, grandfathered both in, there was no testing between the two instruments
- No guidelines for accepting the X
- A vs B, A vs A, B vs B acceptable agreement

- What does it mean?
- Concentration difference plots for A-B vs A/A-X vs A/B-X vs B were presented.
- Bias being seen at concentrations well above our 99th percentile.
- The data is different but it doesn't say we shouldn't accept the data.
- There is no reason not to accept for network use based on the p-values for comparison tests.
- Over the whole range positive bias for the A and B for NADP testing at higher range.
- However a positive bias towards the X at the north sites

5. **AMNet Review** – Tim Sharac

- The review was done September 6-8, 2016 at the AMNet site liaison office and the AMNet site at Horicon, WI.
- This was the first technical review of AMNet since 2009 inception.
- Approach
  1. Interviews and phone calls with AMNet Site Liaison and Database Manager
  2. Inspection of AMNet SOPs, web pages and QA reports
  3. Performance testing the AMNet QA database tool
  4. Inspection of field survey at Horicon, WI
- General observations
  1. Operating successfully, but areas for improvement.
  2. Critically dependent on site liaison for all facets of the network.
  3. Sites Survey SOP has not been approved by QAAG.
  4. Numerous discrepancies between Data Download and Data Access web pages.
  5. QA data tool is effective for data validation.
  6. Site surveys are critical for evaluating site operator performance and troubleshooting equipment.
  7. Site survey results from Horicon, WI
    - Survey procedures are thorough.
    - Audit equipment used was sufficient.
    - Analyzer failed initially, but passed after troubleshooting performed by the site liaison.
    - Site operator very knowledgeable and highly skilled.
    - AMNet equipment shelter parts inventory were in very good condition.
  8. QA database tool results: broke the tool by adding duplicate fields. Therefore, database manager had to rewrite code to only select unique values.
- Summary of Findings
  1. No independent review of preliminary data.
  2. Site survey SOP has not been approved by QAAG.
  3. Numerous discrepancies between data download and data access webpages.
  4. Six sites submit raw data and field notes once a year.
  5. Field surveys performed at three AMNet sites do not have any corresponding available data.
  6. AMNet data download webpage is password protected.
  7. Data archival relies substantially on site liaison laptops and external hard drives; data archiving at the Program Office not feasible at time of review.
  8. Differentiating between Hg plumes or instrument error relies on field notes or site liaison knowledge of the sites' typical ambient Hg concentration.
  9. AMNet testing and equipment storage facility is privately owned by site liaison.
  10. There is no backup site liaison.

- Summary of Recommendations
  1. Have QA manager or other independent person review preliminary data before posting to web.
  2. Complete the site survey SOP and seek approval by QAAG.
  3. Reconcile differences between data available for download vs site list web pages.
  4. Request monthly or more frequent raw data and field notes.
  5. Remove the password.
  6. Resume data archiving at the Program Office.
  7. Provide a monitoring level for typical ambient Hg fluctuations for data review within the QA database tool.
  8. Develop a contingency plan to house AMNet testing equipment at the Program Office.
  9. Pursue a backup site liaison and have this person perform QA routines to demonstrate proficiency.
- Conclusions
  1. AMNet is operating successfully largely due to the efforts, skills, and knowledge of the site liaison
  2. AMNet is critically dependent on site liaison.
  3. Need to resolve discrepancies between data download and data access web pages.
  4. QA database tool is effective for data validation routines.
  5. Site survey SOP needs to be completed and approved by QAAG.
  6. Need to get data quicker from a subset of the network.
- Suggestions for Next Review
  1. Interview NADP Program Coordinator regarding quality assurance of the final AMNet data.
  2. Interview more site operators.
  3. Evaluate progress made towards resolving findings and recommendations from this review.
- **Motion 3:** Move to accept the AMNet Report and take these findings forward to Exec.
- Moved: Chris Lehmann; Second: Eric Prestbo; Motion carried.

## 6. Site Survey Report – Eric Hebert

- NADP Site Survey Program 2016
- 98 site locations
- Surveyed 127 collectors; NTN-86; MDN-60; AIRMoN-1
- 93 gages – presented as found e-gage accuracy plot
- Plot presented of inactivated sensor temperature vs Ambient temperature.
- Plot of activated sensor temp increase and elapsed time – 4 sensors that were replaced.
- Target temperature is approx. 60 deg C.
- Some of the issues they are seeing at the sites
  - Aerochem dry side bag, grids, boots, silicone around ETI Noah-IV chamber, bugs, frogs, cracks in Thies sensors,
  - New Teflon liner on Aerochem, are thicker, harder for operator to put on
  - Electrical issues
  - Parts on Aerochem are starting to deteriorate
  - Corrosion on ETI sensor, broken pins
  - Corrosion on NCON collectors arms, splash shield corrosion
  - ETI bucket leaks
  - Mice, ants, spiders, inside the raingage shells

- Unlevel lids on NCON-MDN
  - Cracks from overtightening the clamp holding the sensor
  - Corrosion on battery terminals
  - Poor lid seals with buckets
- So what do we see in survey data?
  - Percent of collectors violating the 30 degree guideline for trees, pattern increases every three years
  - Percent of ACM Collectors with dirty dry-side buckets increased in 2016; a new site survey tech was looking at wrong part of dirty dry side buckets
  - Only about 60% of Aerochem are meeting all assessments, but NCON 85 % meeting all assessments, no dry side buckets on NCON
  - Of the 127 collectors surveyed, 72% are meeting all assessments
  - However more of the NCON have poorer seals than the Aerochem

## 7. Equipment Testing – Mark Rhodes

- Ott Pluvio<sup>2</sup> raingages are now sold in two configurations:
  - Pluvio<sup>2</sup>-L \$4600 no RMM no ring heater
  - Pluvio<sup>2</sup>-S \$4200 no RMM no ring heater
- Pluvio<sup>2</sup>'s use same load cell and electronics but different housing
- Lab testing included target and response tests, these were dead on with low volumes and larger volumes
- Field testing followed with installation at IL11: Pluvio<sup>2</sup>-L, Pluvio<sup>2</sup>-S and CRN Geonor
- Results show with every precipitation event, the two Pluvio<sup>2</sup>'s diverge from the Pluvio<sup>2</sup> (original), with the Pluvio<sup>2</sup> (original) always reporting higher
- The gage is performing as expected with calibrations
- The Pluvio<sup>2</sup>-S has 200cm<sup>2</sup> collection area, 16cm diameter, capacity is less than Pluvio<sup>2</sup>-L but more than the ETI
- Potential Collector Test suggested for ECCC designed model D400; Estimated cost ~\$6060; 24VDC with linear actuator can be used with Thies sensor; load cell with data logging capability
- Also, New Star Environmental (Roswell, GA); Estimated cost ~\$5495; 12VDC linear actuator motor; grid sensor (old Graseby Andersen model)
- Do we go down the road to test collectors?
- **Motion 4:** Authorize the Program Office to purchase an ECCC D400 model collector
- Moved: Chris Rogers, Second: Eric Hebert; Motion carried.
- Thies Precipitation Monitor, four modes for Heater based on control temperature
- On the NCON, Thies A/B heater modes; operating voltage 12-24VAC/DC; peak current is approximately a quarter of original Thies; Power usage (without triggering) is approximately that of original Thies with heater disabled; with continuous triggering it is approximately same as original Thies.
- Sensor study at Bondville continues
- PETG bottle study for MDN
- 2016 total Hg bottle blank data
  - Glass =0.010ng
  - PETG =-0.002ng
- Could remove bottle blank step if we make the change
- With low volume samples, greater stability in PETG bottles
- Advantage of PETG, not very breakable, less leakage than with glass bottles
- Less breakage means we can move away from coolers to box for shipping

- Redesign the funnel and thistle tube
- Cost analysis needs to be done from reduced bottle washing
- PETG bottle integrity will degrade over repeated use, but then would become recyclable
- Looking for alternative sample train suggestions?

#### 8. **CASTNET Update** – Melissa Pulchalski

- There are 95 sites measuring weekly concentrations of  $\text{SO}_2$ ,  $\text{SO}_4^{2-}$ ,  $\text{HNO}_3$ ,  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , Cl, and base cations
- There are 58 EPA, 26 NPS, 5 BLM-Wyoming and 6 EPA small footprint sites
- There are 80 sites measuring ozone and 8 sites measuring trace gases
- Network has been growing, more so from the addition of partner sites; attribute some growth to small footprint sites which can be easier to deploy
- All CASTNET ozone measurements submitted to EPA's Air Quality systems database
- CASTNET provides ozone data in rural areas, to look at high elevations sites, background ozone and impacts from wildfires
- Ozone QA/QC; Compliance with CFR, improvements have been made to CASTNET ozone QA/QC program
- Most sites below the standard ozone design values (3 year average)
- Trace gas monitoring of NO/NO<sub>y</sub> hourly measurements at 8 sites to improve model estimates related to ozone formation
- Speciated reactive nitrogen (Nitrotrain- experimental hourly trace level total reactive nitrogen sampling system)
- Small-Footprint, Low Power Sites
  - Fill in spatial gaps in the network to improve deposition estimates
  - Allows flexibility for special studies
  - Access to remote areas where power would be difficult
  - Nez Perce, ID has a small footprint regulatory ozone monitor
- Dry deposition trends
  - No longer supporting MLM (site specific deposition velocities)
  - Dry and total dep reported using Vd from CMAQ grids
  - Trend analysis will begin in 2000
  - Deposition trends are similar between MLM and CMAQ but levels are different
  - CASTNET will provide point estimates for sites using 9, 12km grid cells
- CASTNET publications have been increasing, a spike in 2015 was due to TDEP paper

#### 9. **Dry Deposition Pilot Update** – Janice Brahney (Call-in)

Leveraging the NADP to fill critical dust deposition data and knowledge gaps

- Progress to date: funding, Engineering, Project Collaborators, Implementation
- 16 sites planned
- Funding:
  - Oak Ridge University Association seed grant (pending for pilot study)
  - US Forest Service Partnership grant
  - NSF DEB pre-proposal (pending for larger project)
  - DOE-RMBL special focus area (pending for CO sites)
  - USGS partner grants?
  - College will provide funding for pilot sites even if the Oak Ridge grant is not received
- Engineering: Build prototype, find an engineer that would produce a prototype worthy of the NADP, i.e. good quality

- Engineer#1: Was poor quality and not what she was looking for
- Engineer#2: Dr. Cody Youngbull at Flathead Lake Research Station, MT
  - SensorSpace - Build materials that are not readily available for ecosystem projects
  - Laser cut filter screens with tabs for alignment Retention Ring to pin the filter with a press fit, no gluing required. Screens are therefore independently replaceable. This system will work.
- Project Partners: Dust on Snow Comparisons Winter 2017/18
  - CODOS – Jeff Derry
  - USGS – Graham Sexstone
  - NIWOT/RMBL Jeff Deems, Noah Moltoch
- Implementation
  - Wind tunnel test on prototype
  - Start at partner sites/in Utah?
  - All pilot sites starting by winter 2017/18

Recess until Wednesday April 26, 2017 at 8:30.

### **April 26, 2017**

Greg Wetherbee called the meeting to order at 08:35.

#### **10. CAPMoN Update – Richard Tanabe**

- Ongoing transition of Network operations
- Measurements and sites remain status quo
- Responsible for technical support of 34 sites (i.e. day-to-day operation)
- Administrative support of all operator contracts and approximately 2/3 of the infrastructure costs
- Continue with 5 MDN supported sites; PQ17/SK28 closed in March 2017
- 3 AMoN sites, ON25/ON26 moved to SK27/SK28
- Operational support of 1 NTN site
- Site relocations completed for NS01 and CAN5
- Laboratory Update
  - In 2016, Sample analysis totals 6,900 precipitation and 8,400 air
  - Facing same challenges as CASTNET; discontinuation of Nylabsorb filters
  - Working with AMECFW on suitable replacement (MTL?)
  - Have started field testing, breakthrough and loading tests
- Next generation precipitation collector has gone to production
- First 6 units to be delivered in June 2017; options for 10 each of next three years
- Highlighted specifications include AC or DC operation, modular, operational data/diagnostics stored on SD card, bucket switch, load cell, linear actuator
- Equipment testing continues at Egbert with both wet-only collectors and electronic gauges
- Still pursuing solar operation with scaled down version of prototype setup
- Weekly Precipitation Inter-comparison
  - Option of weekly sampling being considered
  - Bag sampling
  - Previously went down this path in 2000's
  - Running at 3 sites

## 11. USGS External Quality Assurance – Greg Wetherbee

- Collocated Work at SD08 and OH71
  - Looking at variability of NCON data, over the next several years with collocated NCONs
  - SD08 went dark for 6 weeks
  - Observed that flies were opening lid
  - OH71 has power issues
  - Paired NCON exposure summary
  - Median absolute percent differences were higher at OH71
- 2016 Interlaboratory Results
  - Nitrate concentration difference control charts for CAL look good
  - 10 labs participate in program
  - Median relative concentration differences
    - CAL performing well
    - ECCC little higher for SO<sub>4</sub>
  - Summary of control charts outside statistical control
    - CAL/ECST had clean blanks
- CAL continues to demonstrate good performance on all levels
- 1997-2016 Field Audit Network Maximum Contamination Levels (NMCLs)
  - Compare 25% remaining in bottle and 75% that was in the bucket using bucket –minus-bottle concentration differences
  - Nitrate and sulfate contamination in the field shows a decrease in last 3-year running average
  - Ammonium contamination and loss have remained the same
- Sample Stability
  - Hydrogen ion loss is coming down
- Network maximum contamination levels and Ptiles
  - How much of data on low end could be contaminated?
  - e.g. lower 23% for Ca and lower 27% Mg
- 3-year moving NMCL increased slightly for base cations
- Hg Interlaboratory Results
  - 2016 MDN interlaboratory control chart summary
  - HAL: of 20 samples 0 analyses exceeding warning limits and 0 exceeding control limits
  - 2 labs have been removed in 2016
  - SGS will be back in starting in May2017
  - HAL performance consistent with previous years
- 2016 MDN System Blank
  - There were a few instances of contaminated control samples probably due to field handling contamination
  - NMCL – 0.095ng 2014-16
  - 3-year Hg mass decreased 0.12 to 0.10 ng per samples
  - Participation in system Blank program 63% for 2016
- 2016 Publications
  - Environmental Pollution – Collector bias paper
  - USGS Scientific investigations Report 2016-5069 – 2013-14 External QA Report
  - Open file report 2016-2013
  - Operational protocols for PCQA project
- NUANC – Network for Urban Atmospheric Nitrogen Chemistry
  - Look at urban deposition



- Urban areas not representative on the maps
- Urban to rural transect with 5 sites in the Denver area
- NTN bag sampling – collecting filtered solids for XRF (2018?)
- Theis sensor with Aerochems
- Upslope storm event sampling (E to W)
- 15N and 18O in NO<sub>3</sub><sup>-</sup> molecule
- CSU ambient NH<sub>3</sub> passive

## 12. USGS Telemetry Update: Current status and recommendations – Amy Ludtke

- USGS Telemetry Model
  - 11 sites on telemetry
  - Rely on USGS local Water Science Center (WSC) offices to setup data collection platform (DCP) equipment
    - CSI TS312 GOES transmitter/YAGI antenna/power and antenna cables/solar panels and DC setup for some sites
  - Uses the GOES satellite for data transmission - no cost
  - Transmits every 15 minutes
  - Data downloaded and “decoded” to USGS NWIS RealTime database
  - USGS RealTime data displays plots for checking parameters
- The Good
  - 15-16 parameters
  - Site operators can troubleshoot prior to site visit
  - Data uploaded every 15 minutes and current to within past hour
  - Replaces PDA or flash drive downloads and automates the data transfers
- The Bad
  - USGS-Centric
    - Rely on WSC field techs for installation/maintenance
    - Requires USGS data center to run a “DECODES” program
    - Universal DECODES program provided, but WSC renamed variables
  - NADP-Program Office
    - Wrote programs to download real-time data from web which requires modifications with USGS changes
    - Not familiar with equipment for troubleshooting
- The Ugly
  - Equipment outdated, not able to update or repair.
  - Doesn’t allow tech transfer to sites operated by other agencies.
  - Failure rate has been high with 3 of 11 units either requiring repair or just bad units.
  - WSCs have full control of web sites access, and can shut down for any site problems.
- Recommendations
  - Have telemetry ad-hoc group work with industry to develop a telemetry unit or units that are “plug and play”
    - Satellite or cell phone
  - Need to be rugged and low power so that remote sites where telemetry is needed the most are able to power units
  - Would allow for data access and transferability between NADP sites
  - Program Office should be the experts in the system for troubleshooting
  - Program Office should have full control of data receiving, own the process and the access

### 13. Radiello Sampler Characterization – Chris Lehmann

- Material Characterization
  - Micrometrics Analytical
    - Nitrogen pycnometry, characterize bulk Density – non destructive
    - Mercury porosimetry - Median pore diameter/apparent density/bulk density/percent porosity
      - could be run on U-of-I campus (already available)
  - Four Radiello samplers – triplicate deployment and one new sampler
    - 6% difference between low and high extract concentration
    - Percent porosity ~6%
    - Density – spot on
- Further work
  - Save triplicate samplers at extraction if deviation of measurements >10%, then send for characterization
  - Save broken samplers, send approx. 30, from different “lots”, different age
  - Purchase instrument for CAL? Or contract out?

### 14. CAL Automated pH Update – Chris Lehmann

- EasyPREP TitrEC made by SCP Science, Montreal, QC received August 2015
  - Purchased cover to ensure samples not contaminated, allow loading of samples and continuing with other tasks
  - Results output is compatible with CAL LIMS
- Motion was passed at 2016 NADP Fall meeting to begin using on January 1, 2017
- It has been used since January 3, 2017 for all samples
- Data comparison
  - 3 manual meters
  - TitrEC instrument
- Test solutions
  - CAL prepared QC solutions
  - ECCC NWRI solutions
  - AIRMoN samples
- Good agreement with CAL data vs ECCC
- Internal standards
  - Median of TitrEC on the target line
- Looked at AIRMoN samples TitrEC vs manual measurements Jan 1 – Apr 18, 2017
- TitrEC temperature increases during operation
- 3 degrees was the maximum, but still within control limits
- Automated Conductivity Measurements (?)
  - TitrEC does not meet measurement quality objectives
  - Received conductivity module Hach/Lachat 8500 series 2; Will install on research instrument
  - Report back at fall meeting
- New Protocols – Manual pH Measurements
  - NTN samples
    - TitrEC
    - Discontinued manual measurements as of Jan 2017
    - Reanalysis: TitrEC, as of May 1, 2017 (currently manual + TitrEC)
  - AIRMoN samples
    - Titrec (first priority)

- Manual measurement, second
- Reanalysis: titrec and manual
- External QC samples (WMO, NWRI, USGS, NILU, etc.)
  - TitrEC (used for priority-reporting of “official” values)
  - Manual (internal verification only)
- Internal QC Samples (blanks, internal standards, etc.)
  - TitrEC (priority)
  - No manual measurements

#### 15. Methyl Mercury Open Discussion – Marty Risch, Dennis Jackson

- Picked up from AGU talk presented by Greg Wetherbee
- Methyl Mercury from NADP sites 1998-2013
- 61 official sites – 74 locations, 5,375 samples
- Combination of composite and splits
- 66% Methyl Mercury results < reporting limits
- Methyl Mercury <8% of total Hg concentration, at most 0.5 ng/L
- Methyl Mercury in litterfall – 8 co-located sites
- Methyl Mercury detected in 46% of 273 monthly composite precipitation samples
- Methyl Mercury EPA method 1630
- Split samples >25 mL
- Composite samples aliquots were 10% of sample mass if >25mL sample was present
- Notes from discussion at Fall 2016 NADP meeting
  - Dennis Jackson reported composites were 56% (3,354 of 5,984 samples)
- NOS looking for ideas on how to get enough meaningful Methyl Mercury data to continue monitoring and reporting
  - Every sample does not need to be analyzed
  - No more composite samples is desirable
  - % detection by site differs for composites vs split samples
  - Proposal to choose number of samples per year that will give consistent data (i.e. 12 per year, 1 per month)
  - Some eligible samples will not be analyzed for Methyl Mercury
  - Cap the number analyzed per year for set fee
  - Sample eligibility couple would be based on sample volume or % annual volume, based on a volume threshold
- Sites currently requesting Methyl Mercury will be consulted about any ideas that NOS comes up with from this discussion
- Discussion to the floor
  - Dennis Jackson
    - Not in favor of compositing samples
    - Advocate to representative monthly sample
  - Bob Brunette
    - MN/WI sites went to composite due to cost
    - Highest Methyl Mercury in precipitation spring/early summer
    - Possibility to offer tailored product to sites
  - Mark Olson
    - May face some resistance to change if they have been doing for a long time
  - Wetherbee

- Devise a plan to present to site sponsors
- Minimum threshold for analysis
- When reached 12 would be done, and may end up with the period interested in
- Marty Risch
  - People already in discussion would continue and formulate a plan that can be brought to fall meeting.

#### 16. **Extreme Event Operations** – Richard Tanabe

- Extreme weather can have significant impacts on site operations
- Examples from CAPMoN NADP sites presented, straight line winds, wildfires, flooding
- Extreme Events
  - Weather
    - Hurricanes/tropical storms
    - Ice storms/blizzards/ “snowmageddon”
    - Tornados
    - Lightning strikes
  - Wildfires
  - Vandalism/theft
  - US Federal Government shutdowns
    - 1995/96 (21-28 days)
    - 2013 (14-29 days)
- Focused on NTN Sites
  - CAL database query: Sample duration>194 hours; QR code=“C”; Comments field search of keywords i.e. “hurricane”, “fire”, etc.
  - Applicable to all networks not just NTN
  - Observations: not all operators provide a comment for samples exceeding 194 hours; only includes samples that exceed; and does not include missed samples
- Impacts: Social, Environmental and Economic
  - Evacuation, Site Access, Flooding, Wind Damage, Loss of Power, Equipment/Property damage
- Hurricanes have the ability to impact a large number of sites
- Extreme events are regional to some extent in terms of the different types
- Table of invalidated samples due to extreme events in the last 5 years; approximately 20% of samples are invalidated each year
- Operational Considerations
  - Operator safety
  - Potential for equipment damage
  - Removal of equipment
  - Serious damage/destruction: Who pays?
- Impacts on NADP data
  - Data completeness
  - Sample validity
  - “lost”/invalidated samples may be the ones that contribute large rain/snowfall amounts
  - Presents a challenge for data users (TDEP, CLAD,etc)
- What is done now?
  - Up to individual site operators/supervisors to make the call
  - Does it happen to more sites than reported?

- Path Forward?
  - Guidance document? Do and don'ts
  - Add to FAQ in Site Operation documents?
  - Extreme events are regional, can flag sites
  - "Heads Up" e-mail to regionally affected sites
  - Address as part of Operator Training
  - Status quo?

Motion to Adjourn meeting by Marty Risch, second: Mark Nilles. Meeting adjourned at 11:10 am  
Optional Field Trip to KY19 Site – Louisville Metro Air Quality

Prepared by: Richard Tanabe, NOS Secretary