Joint Sub-Committee Meeting
Pacific Grove, California
April 14-15, 2015

Start time 10:12 (2015-04-14)

- ***Motion to approve minutes*** *from Fall 2015 meeting moved by Greg Wetherbee, seconded by Eric Hebert.* ***Minutes approved.***

- **State of NADP: NADP Program Office Report (David Gay)**

Network and Site News

NTN

- 1 lost and 2 added, 6 restarts Total of 266 currently
- TVA – out of environmental monitoring
  - 5 NTN sites restarted, divided up by the feds
- Two/three new sites at 1890 SAES sites
  - NC A&T (NTN/MDN)
  - SC State next year (NTN/MDN)
  - FAMU next 10 months (NTN/MDN)

Sampling News

- 400,000th NTN sample at MT00 28 Mar 2015
- The 100,000th sample was collected at MT00 8/6/91

AIRMoN

- Bag sampling
- Status quo

MDN

- 3 lost and 5 added Total 118 sites

AMoN

- 0 lost and 26 added Total of 91 sites
- 1/3 increases in last 12 months
- 5 pending sites

AMNet

- 0 lost, 0 added Total 24 sites
- QA on Tekrans
- Mark Olson talk in Joint on Wednesday

Hg Litterfall Initiative

- Successful 3 years 2012-14
- 2015 start in August

- 13 sites (PR is weekly)

Sites in jeopardy of closing (as of March 2015)

- Mini newsletter to stakeholders
- 6 NC sites will lose funding (these are pre-1985 sites)
- 1 NY site is to move and restart
- 3 MDN sites in AK
- Recently closed 2 KS sites
- Sites recently refunded include 5 TVA sites and WA03

Data Highlights

- Data availability

1. Final data up to 2013
2. Data since 2013 are either Preliminary (on web), at PO or collected

- Data Format Change
    - NTN/AIRMoN/MDN data on the web
    - Data status column
        - 1= from lab, will not be shown
        - 2= preliminary
        - 3= final
    - Adding bromine data for NTN/AIRMoN
    - QR Code (A/B/C) for NTN will be consistent with MDN, AIRMoN
    - Methyl Mercury Data
        - 2002 through current will update as move forward
        - Separate from Total Hg database

Equipment News

- Aerochem
    - 33 motor boxes, no clocks, 15 sensors
- NCON
    - Not a bad winter overall
    - Only 4 motorboxes since 2007
    - Thies covers are cracking, 25 have cracked
    - Currently rebuild with Thies parts
    - May be able to make them on the mill using Delrin plastic for 1/3 of the price of thies parts
    - Jack and Martha have retired, Bly Hartley has taken over, the company moved from Crawford, GA to Arnoldsville, GA
    - The cost of single and double MDN collectors has gone up ~$600, no change to NTN. It has been 4 years since the last price increase.

- ETI
    - NOAH IV price change, the first in 9 years. NOAH ~$220 increase, SC115 ~$30 more
- Current E-gage Network

- 278 of 312
- 90.3% are digital
- NTN 89.1%
- MDN 94%
- ~37 sites are still Belfort

Other Highlights

- New 5 year agreement with SAES NRSP#3 2015-2019
- Quarterly newsletter – 2nd one is out
- Ella Ashford – wins 1st place with NADP related science fair project in WA
- Milky Rain in eastern WA and northern OR
- 236 journal articles using NADP data
- EROS will work on more stats from the publications
- Chul-un Ro of Environment Canada retired
  - An article written about Ro "A Scientist's Love for Creation"
  - http://www.tyndale.ca/magazine/volume-3-2/scientists-love-for-creation

- **CAL Status Report (Chris Lehmann)**
  - *Detailed report is posted at* http://go.illinois.edu/NADPCALReport

Site Operations and Site Support

- Milestones
  - 400,000th sample collected
  - AIRMoN is approaching 30,000 (Since 1992)
  - AMoN is approaching 10,000 (Since 2007)
- NTN
  - 4 new sites, 5 closed and 43 with significant issues (i.e. power, equipment, e-gage, winter, other)
- AIRMoN
  - Bag sampling update – initiated on Oct 1
  - Failures – of 450 wet samples there were 8 failures
  - AIRMoN bag leak video
    - Pin prick holes
    - Additional tests in the lab
- AMoN
  - 28 new sites 0 closed
  - No significant issues
  - New screw type coupler – the site operators like the change
  - Occasional high travel blanks
  - Diffusion bodies still breaking in transit
  - New AMoN packaging? Zip lock bags rather than jars, testing in the lab

- Training Webinars – 2015 upcoming webinars

- May 6 – Summerization and Site Maintenance
- July – You and your solar panel

- Lab Operations
  - Oct 2014 – 60mL Nalgene were rinsed with tap water
  - Discovered from internal filter blank
  - 236 affected samples (analyzed), 208 archive splits were re-analyzed, the other 28 were invalidated
  - Revised NTN Sample Processing as of Jan 1, 2015
  - AIRMoN reprioritized in March 2015
  - 25% of 133 samples that only had pH/conductivity previously, now have a full analysis
  - Leaking Bottles – re-use increases in leakage
    - Options for 1 use bottle (would require 1L to ½ L)
    - Leaks in and out of bottle – introducing contamination
    - As bottles age – leaks increase
    - Option to select a cut-off for usage to eliminate leakage
    - Referred to NOS
  - Instrument replacement – New ICP and pH/Conductivity (SCP Science) May 2015 delivery
    - Report provided at Fall meeting

- Quality Assurance
  - 2013 QA report published
  - 2014 QA report in preparation
  - 2014 QA Plan published
  - SOP's (51) available on request
  - 2015 Instrument Detection Limits (IDL) is slightly up, the Method Detection Limits (MDL) is down

- Data Management
  - Data delivery – NTN (50 days); AMoN (44 days); AIRMoN (43 days)

- **QA Report (Mark Rhodes)**
- 2013 QA Reports are posted; 2014 reports are in progress
- External HAL Review
  - July 28-30, 2015
  - Dennis Jackson (SRNL), Chris Rogers (AMEC), Ted Struzeski (USGS), Richard Tanabe (EC)
- QAAG Conference Call
  - 5 year review schedule, it would follow contract period
- Site Surveys
  - AIRMoN (3); MDN (23); NTN (57); Co-located (14); AMNet (14 – 2x2); AMoN (2)
  - Cracks in shelter for AMoN – Remind operators to inspect and report
- Travel Blank Concentrations
  - 2009-2014 – creeping up

- 2015 – big drop
- decrease in individual samples *ULine/Kimwipes are bad – High in NH#*
- drop in concentration once ULine/Kimwipes removed from process

- DQO Special Studies
  - Bucket Split Study participation 5/5 AIRMoN; 22/26 NTN
    - QA sample provided
    - How much variability introduced by operator
  - Field Split Study participation
    - Is aliquot taken representative of entire sample
    - NTN 14/25 when field sample is >500g
    - Bag results are great, within noise of instrument – when compared to MDL results from lab
    - Buckets not as clean as bags but still reasonable results

- **Sub-committee Chairs**
- Chairs provided agenda overviews

2015-05-15

Start time 13:55

- **Subcommittee Reports**
  - EROS (Pam Padgett) – refer to EROS minutes
  - DMAG (Bob Larson)
    - Inaugural meeting – 3 people, overlap with QAAG, CLAD
    - Who should participate – CAL, HAL, Bob L., each network, data users
    - Motion: 24 samples processed after 2015 Jan 1 processed with new method. Treat those as they should have been – remove chemistry, low volume samples
    - Conference call in May on MeHg data
    - Documentation plan
  - CLAD (Jason Lynch) – refer to CLAD minutes
  - NOS (Amy Ludtke) – refer to NOS minutes
  - EROS (Pam Padgett) – refer to EROS minutes
  - TDEP Status Report (Gary Lear) – refer to TDEP minutes
    - Current status of TDEP maps version 2014.02 for 2002-2013 available on CASTNet/NADP websites
    - Plans for 2015.02 expected in June 2015 – Ammonia, base cations, sea salt sulfate
    - Motion: separate meeting day in the future

- **HAL Report (Bob Brunette)**
  - Site start-ups and shut-downs summary for 2014
  - Pacific NW high mercury deposition – funding will expire at the end of 2015
  - MDN Hg Lab – cross training staff
  - Equipment modernization update
    - MDN ACM=59 NCON=59
    - Belfort 11 E-gage=107

- Global Mercury Observation Systems (GMOS)
- Site Liaison Activity summary
  - Field tech support 317 calls and 304 e-mails
- 2012 HAL Review summary
  - Access to SQL progress update – database conversion is very close
- Distribution of QR Codes (2006-13) – C codes have plateaued
- Data delivery schedule

▪ Oct 2014	Operator (1/12/15)	PO (2/6/15)
▪ Nov 2014	(2/6/15)	(3/3/15)
▪ Dec 2014	(3/3/15)	(3/31/15)
▪ Jan 2015	(3/27/15)	(4/30/15)

  - Possibly eliminate 2 week site operators review to get to PO faster
  - Methyl Mercury reported quarterly; Q3 submitted to PO; Q4 to be submitted with Jan 2015 data
- 2014 Annual QA Report – waiting for one more month of MeHg data
- 2014 MDN HAL/PO Evaporation study – redo in a bigger oven in order to put entire train in high temperatures
- Trace metal initiative – difficulty finding working advocates
- 10 trace metal sites in 2015 – measurable signals of various metals i.e. copper, manganese, nickel, etc.
- Participation in NILU International Trace Metal Comparison
- HAL Outreach 2015 summary
  - Potential MDN international sites
  - Outreach to active monitoring programs
  - First quarterly newsletter (June 2015)
  - EPA National Rivers Streams Assessment 3rd year
- Upcoming MDN HAL Activities
  - Hg isotopic ratios in wet deposition
  - High Hg deposition monitoring (Pacific NW)
  - Possible enhanced reports for site sponsors
  - Low elevation radiation fog
  - EPA Region 6: 2015-2017:Post MATS Total Hg Deposition
- Proposal to State Department for Measuring Hg Deposition

- **<u>CLAD Critical Load Maps (Jason Lynch)</u>**
- Purpose:
  - Illustrate Critical Loads in NCLD
  - Educate
  - To identify data gaps and additional needs
- Challenges
  - No one method can be used for all endpoints
  - Each endpoint has unique differences
  - Critical Loads represent different spatial scales
  - Not “Over represent” the data

        - To display uncertainty

- Critical Loads Map Series
        - Empirical – Pardo et al 2011/Geiser et al 2010
        - Forest Ecosystem – CL for acidity
        - Surface water – CL for acidity
    - Lots of decisions on each to determine a solid map
    - Empirical CL map for N maps presented based on Pardo and Geiser work
  - Presentation
        - NCLD metadata file
        - Short summary PDF of on-line document
        - Short summary document (EROS) in progress

- **<u>NADP Site Operators On-Line Training (Jason Karlstrom)</u>**
    - Online training via anymeeting.com
    - Since the Fall 2014 meeting there have been 2 CAL (Nov 2014/Mar 2015) webinars and no HAL
    - There are upcoming webinars this summer
    - Training videos in progress
    - There are webinar limitations i.e. zoom
    - Videos posted on Youtube and CAL websites

- **<u>Evaluation of Methyl Mercury (Greg Wetherbee)</u>**
    - MDN Network of sites
        - Method of collection – modified ACM, NCON, Dual NCON
        - Glassware and sample train
    - Sample Processing
        - Weekly or event MeHg split/ monthly MeHg composite
    - Sample Analysis – Eurofins Frontier Global Sciences
        - Total Hg – US EPA Method 1631
        - Methyl Mercury – US EPA Method 1630
    - Extensive QA program
    - Quality ratings codes assigned by the PO
    - Composite samples assigned lowest rating of component samples
    - MeHg summary statistics 2003-2013
        - 5375 non-filtered samples from 74 locations
        - approximately 66% all [MeHg] < RLs
    - MeHg Regression on Ordered Statistics (ROS)
        - All data – A, B & C coded
            - Mean [MeHg] 0.122 +/- 0.450 ng/L
            - Median [MeHg] 0.050 ng/L (=RL)
        - Only A & B coded, no debris
            - Mean [MeHg] 0.078 +/- 0.254 ng/L

        - Median [MeHg] 0.019 ng/L
    - Regional consistency in signals of Mean MeHg
    - Spatial variability – prelim not a whole lot in annual trends – more work to evaluate regional trends
    - Is there a consistent period of time when sites see maximum [MeHg]
        - Composite – most have max occurring in summer; some have max in Nov/Dec
        - Split – bi-modal in % total as MeHg – explore seasonality more; seasonality may be due to sampling frequency
    - Uses for NADP MeHg data
        - Investigating sources
        - Evaluate abiotic reaction mechanisms for MeHg production in precipitation
        - Evaluate pathways of MeHg evasion from aquatic environments followed by local rainout
        - Correlate biological responses to MeHg
    - Data access – contact NADP
    - Conclusions
        - NADP approved extensive QA data set 1998-2013
        - MeHg typically constitutes a small fraction (<8%) of Total Hg concentration in North American precipitation, but even this small fraction is important to quantify
        - Bi-modal seasonality of MeHg in MDN samples is evident, with greatest frequency of annual maximum [MeHg] occurring in summer.
        - The maximum MeHg percentage of total Hg occurs most frequently during winter.
        - Temporal maxima for composite and split samples are slightly different, which warrants investigation

- **<u>Tekran Comparison Study (Mark Olson)</u>**
- Looking for input on improvement of study
    - Challenges
    - Low levels! GOM/PBM pg/m^3
    - GOM is very sticky. High [GOM] will contaminate manifold
    - Basic Tekran operation
    - Critical factors for comparison
        - Gold cartridge variability
        - Flow rates – concentrations are dependent on flow accuracy
        - Internal permeation source calibration – accuracy/variability
    - Previous work done by Olson in 2007
    - Hot topic – Denuder bias
        - Negative GOM bias – depends on form of GOM
        - Concentration of Ozone, RH
        - McClure et al. SEARCH site BHM, AMNet AL19
    - RAMIX – multi instrument comparison
        - Would like to replicate the work
        - Used as a background for study
    - 1 year comparison at WI07 site with 2537X – GEM 4% difference; daisy chain 2537X

IDL=0.51 pg GEM

- GOM and PBM ~MDL – too low for good comparison
- GEM
  - Studies completed (almost)
  - Instrument Detection Limit
  - Method Detection Limit
  - Daisy chain in ambient air
  - Precision, Accuracy
  - Enough data to publish these results
- GOM
  - In-situ concentrations are low and few to compare for precision
  - Need to create GOM
  - Multiple instruments results = Precision
  - Total Mercury analysis = Accuracy
- CEEPAMS – Chimney Experiment to Establish Precision and Accuracy for Mercury Species
  - Focus on GEM/GOM
  - 3 actual inlets at same location in manifold
  - adjustable flow rate 2-8 m/s
  - permeation tubes HgBr2 HgCl2 at 2,4,6,8,10 cm
  - full outdoor met
  - future ozone analysis and generator
  - independent study
  - Flows – 2537 flow rates adjusted to within 0.2%; inlet flows adjusted to within 0.2%
  - CALS – variability, concentrations normalized
  - Total Hg – need to heat to 650°C to convert all species to GEM
    - Difference method comparing Total Hg to GEM concentrations
    - Not seeing difference , need to figure out
    - Will increase total Hg analyzers from 1.5 l/min to 10 l/min
- Next Steps
  - Use Cation Exchange Membrane to determine if GEM increase is GEM only
  - Control GOM production? Temp and flow
  - Change inlet temperature
  - Change denuder coatings
  - Produce and monitor Ozone
  - Relationship to humidity

- **<u>SCUAM Pilot Network Development (Rich Pouyat)</u>**
- Refer to NOS minutes
  - Pam Templer and Tom Whitlow : Creating a Sub-Network of NADP Monitoring Stations in Urban Centers: Test Cases in NYC and Boston
  - Goal
    - Create Sub-Network of Urban sites within NADP
    - Measure spatial heterogeneity of urban landscape
  - Constraints and challenges of establishing Sub-Network of sites

        - Needs to be secure
        - Situated to account for variety of sources and urban heterogeneity
        - Align with NADP siting constraints
    - Funding for pilot NTN site in Boston and possibly NYC
    - Passive sampling? Trace Metals?
    - Near term – focus extension of existing NADP networks
    - Long term – addition of trace metals and passive sampling (approval process)
    - Analysis of EPA TEOM (PM2.5) filters?
    - Looking for other "pilot" locations

- **Spring Meeting Location Changes (Marty Risch)**
    - Reduce costs for Spring locations
    - Moved responsibility from NOS Chair to PO

- **Spring Meeting (Richard Tanabe)**
    - Madison, WI
    - April 25-28, 2016 Committee meetings: 25-27 Executive meeting: 28
    - Madison Concourse Hotel Hotel reservations deadline: March 27, 2016

- **Acid Rain 2015 (David Gay)**
    - October 19-23, 2015 in Rochester, NY
    - See the website for Block Agenda http://www.acidrain2015.org
    - NADP Meeting in Radisson Hotel
    - Typical meeting, just shorter
    - WMO/DEBITS meeting at the same time
    - 7 keynote scheduled, ~105 speakers through the week, 3 poster sessions 225-300

- **Fall Meeting 2016 (Donna Schwede)**
    - Dates: Election year
        - Oct 3 – New funding year
        - Oct 10 – Columbus Day
        - Oct 17 – AAAR
        - Oct 24 – CMAS
        - Oct 31 – Halloween * Starting point/leaning towards
    - Location
        - Sedona
        - Phoenix/Scottsdale
        - Santa Fe
        - Albuquerque * Starting point/leaning towards
        - San Antonio
        - Austin

Motion to adjourn
Moved by Greg Wetherbee , seconded by Mark Rhodes