

Update: NADP Atmospheric Mercury Initiative

We report on progress made over the last two years to establish a North American atmospheric mercury speciation network to support dry deposition estimates, emission regulatory assessments, model evaluation, and long-term trends.

Two years of progress:

- Convened an atmospheric mercury workshop to harmonize field methodologies into a standard operating procedure: NADP Atmospheric Mercury Measurement Expert Workshop Oct 3-4, 2007 – Chicago, IL
- Developed an automated daily instrument QA and data reduction computer program
- Collaborating with operators of 20 established monitoring sites to generate speciated mercury data in accordance with network data quality, data completeness and data submittal requirements
- Added 8 new sites to the network within the past year of operation
- Developed a database of atmospheric mercury speciation data obtained from participating monitoring sites, with over 25 years of QA'd data
- Established a site liaison position to provide field instrument technical support to collaborating site operators
- Coordinated and contributed to a larger national effort to establish a multi-media mercury monitoring program: MercNet National Mercury Monitoring Workshop May 5-7, 2008 – Annapolis, MD

Site liaison accomplishments:



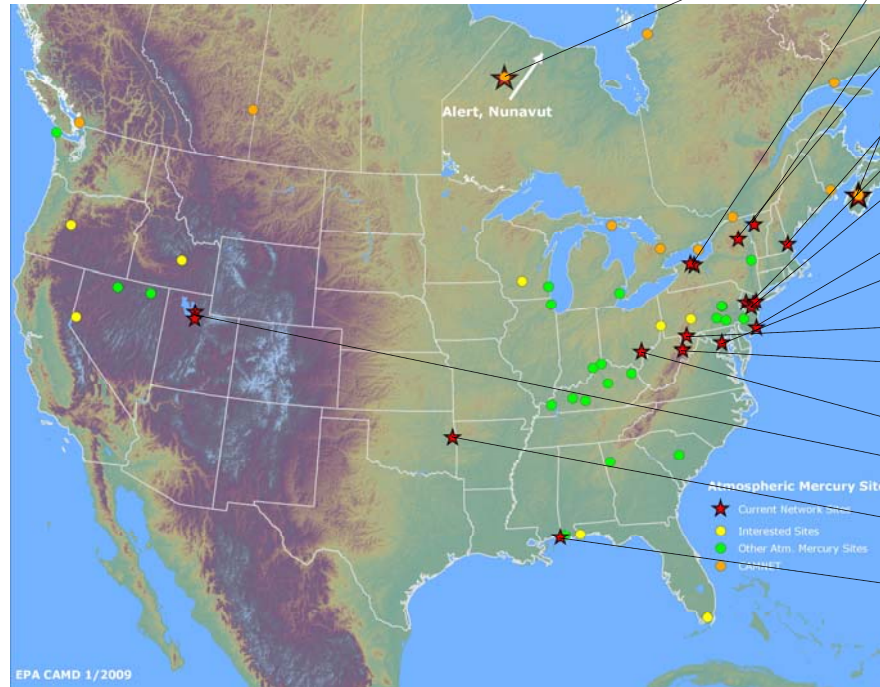
Mark Olson (USGS) is the site liaison for NADP's emerging ambient mercury network. He has been operating Tekrans since 1995. He is readily accessible by phone or email.
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In the last year, Mark Olson has performed a number of QA activities including:

- Visited 15 network sites for QA tests and network conformance
- Wrote 15 site reports for each site visit
- Performed a manual QA review of all 2009 uploaded data
- Drafted a site visit SOP
- Co-developed a site early warning system for remote QA of network data

Tim Sharac¹, David Gay², David Schmeltz¹, Mark Olson³, Eric Prestbo⁴:
U.S. Environmental Protection Agency, Clean Air Markets Division¹, National Atmospheric Deposition Program², U.S. Geological Survey³, Tekran Instruments⁴

Atmospheric Mercury Monitoring Sites



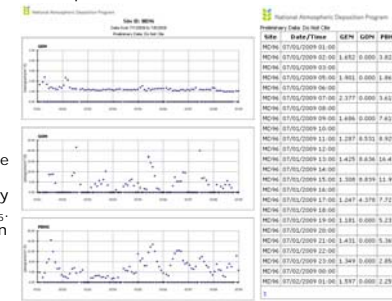
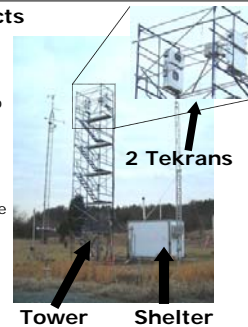
Network Collaborators

Sandy Steffen, Environment Canada; Nunavut, Canada (NU15)
Tom Holsen/Dirk Felton, Clarkson University/NYDEC; Rochester, NY (NY43)/(NY95)
Eric Miller, ERG, LTD.; Underhill, VT (VT99)
Tom Holsen, Clarkson University; Newcomb, NY (NY20)
Rob Tordon, Environment Canada; Nova Scotia, Canada (NS01)
Robert Talbot, University of NH; Thompson Farm, NH (NH06)
Dirk Felton, NYDEC; Bronx, NY (NY06)
Charles Pietarinen/Rudy Zsolway, NJDEP; Chester (NJ32), Elizabeth Lab (NJ54), New Brunswick (NJ30), NJ
Charles Pietarinen/Rudy Zsolway, NJDEP; Brigantine, NJ (NJ05)
Winston Luke/David Schmeltz, NOAA ARL/EPA CAMD; Beltsville, MD (MD99)
Mark Castro, University of Maryland; Frostburg, MD (MD08)
Steve Brooks/Rick Artz, Canaan Valley Institute/NOAA-ARL; Davis, WV (WV99)
Kevin Crist/Gary Conley, Ohio University; Athens, OH (OH02)
Kevin Perry/Neil Olson, University of UT/Utah DEQ; Antelope Island (UT96)/Salt Lake City, UT (UT97)
Ryan Callison/Larry Scrapper, Cherokee Nation; Stillwell, OK (OK99)
Winston Luke/Steve Brooks/Rick Artz, NOAA ARL; Grand Bay, MS (MS12)

Example data products

Beltsville, MD Site Example

The Beltsville site is a collocated NADP and CASTNET site. Shown in the picture on the right is a 10 meter tower with two Tekrans, a site shelter, and atmospheric monitoring equipment. CASTNET equipment provides ancillary information useful for mercury source apportionment and back-trajectory studies. Data products from participating sites available on the NADP website will include concentrations of the three atmospheric mercury fractions: elemental (GEM), oxidized (GOM), and particulate-bound (PBM_{2.5}). All data will have quality assurance notes, QC flags, and in some instances, notes from the site operators. Graphical and tabular network data summaries are distributed in accordance with the distribution policy.



The example data on the right from one of the two Tekrans at the Beltsville, MD monitoring site display GEM, GOM and PBM_{2.5} mercury concentration data as available on the NADP website.

Quality Assurance

- Field SOP development:
 - We have completed and distributed version 2.0 of the field SOP to provide Tekran users with consistent procedures that are scientifically reviewed. The quality assurance procedures for GOM, PBM_{2.5} and GEM concentration measurements are detector calibration, contamination prevention, air flow calibration, leak checking, temperature control and ensuring the CVAFS detector is maintained and operates within acceptable limits.
- Data SOP development:
 - We have completed version 1.0 of the SOP and the computer programs to automate data review, QA flagging, and Quality Rating Codes (A/B/C quality). The goal is for the Data Management system to ensure quality, consistency, and timely data availability to users. Data will be retrieved from the mercury instruments in one of two ways (FTP/data logger or manual upload). Hourly speciated concentrations will be determined to be either valid or invalid; criteria are outlined in the data management SOP. A minimum 75% data completeness will be required for daily, weekly, monthly, seasonal, and annual averages.

For more information please visit: <http://nadp.sws.uiuc.edu/amn/>