Mercury Deposition Monitoring at the Holbrook Site, Greene County, PA

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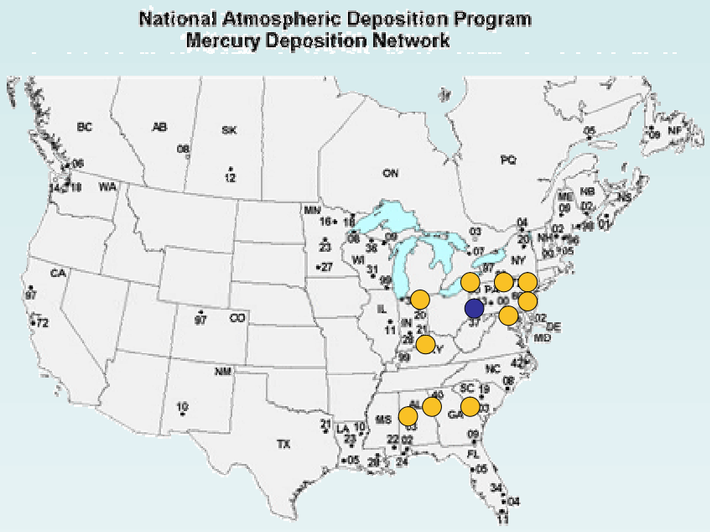
Introduction

For the past several years beginning in May 1999, the U S Dept. of Energy's National Energy Technology Laboratory (NETL) has been sponsoring a mercury deposition-monitoring site at Holbrook, a former rural NARSTO-Northeast site near Waynesburg, PA. This Holbrook site (PA37), operated by Advanced Technology Systems, Inc. (ATS) under contract to NETL, is one of nine sites that are operated by the Mercury Deposition Network (MDN) in Pennsylvania. The objective of the MDN, as part of the National Atmospheric Deposition Program (NADP), is to develop a national database of weekly concentrations of total mercury in precipitation and the seasonal and annual flux of total mercury in wet deposition. The data is used to develop information on spatial and seasonal trends in mercury deposited to surface waters, forested watersheds, and other sensitive receptors. The MDN began with 13 sites in 1995. There are currently 74 sites in the MDN (July 2003). The MDN is a dynamic network, and as such, the number and locations of sites is expected to vary as a function of time.



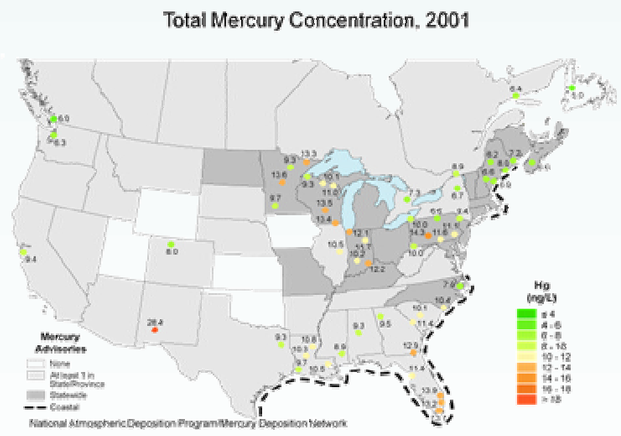
Experimental

The network uses standardized methods for collection and analyses. Weekly precipitation samples are collected in a modified Aerochem Metrics model 301 collector. The "wet-side" sampling glassware is removed from the collector every Tuesday and mailed to the **Hg Analytical Laboratory (HAL**) at Frontier Geosciences in Seattle, WA for analysis by cold vapor atomic fluorescence. The MDN provides data for total mercury, but also includes methylmercury if desired by a site sponsor.

The aim of this presentation is to compare results obtained from the PA37 site and with those acquired at adjoining or regionally relevant locations. The chosen sites were PA13, PA30, PA60, PA72 and PA90; IN20 and IN21; SC03 and SC19; and GA40 and AL03.

Table 1: Hg Deposition / Concentration Weekly Averages		
Site Code	**Deposition (ng/m2)**	**Concentration (ng/L)**
PA37	176.9971	10.1606
PA13	181.4877	11.0070
PA30	189.1450	11.3776
PA60	199.7681	11.5923
PA72	161.7410	10.5458
PA90	108.6933	7.5823
IN20	181.7772	10.5427
IN21	259.6480	12.3314
SC03	226.5078	10.4727
SC19	184.9295	9.7605
AL03	223.3313	9.1371
GA40	173.5106	10.4308

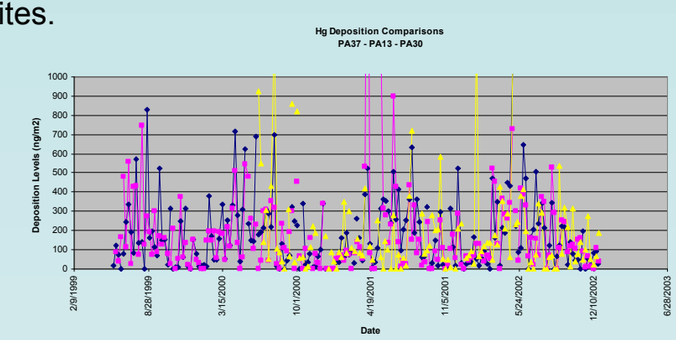
National Averages:
Deposition 180.7047 ng/m^2
Concentration 9.5545 ng/L

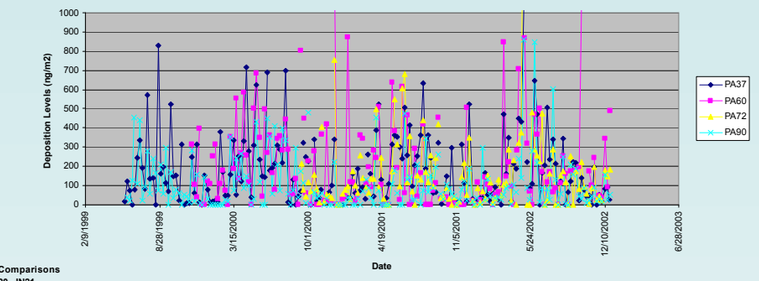


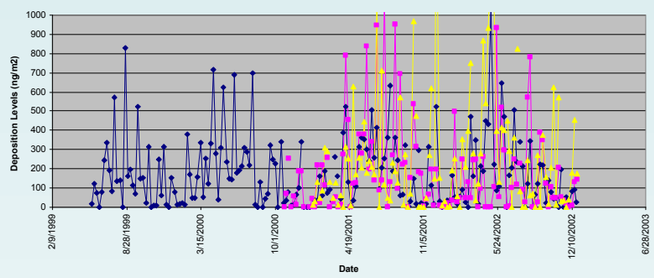
Results and Discussion

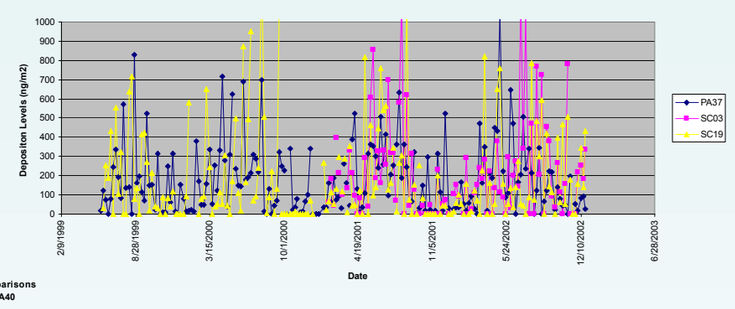
Data, through 2002, are available at http://nadp.sws.uiuc.edu/sites/siteinfo.asp?id=PA37&net=MDN.

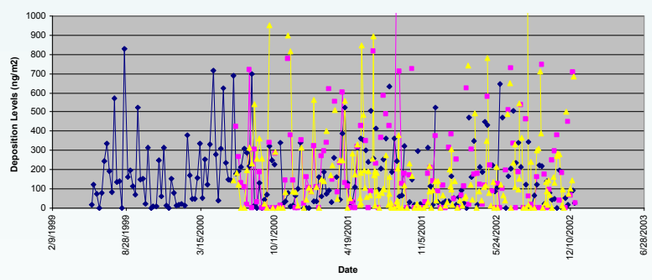
The results, as shown in Table 1, indicate that the average values for PA37 do not differ significantly from the other PA sites except for PA90 which has consistently shown lower values compared to the national MDN average values. Comparisons with other regional sites indicate substantially higher depositions upwind of the PA sites.

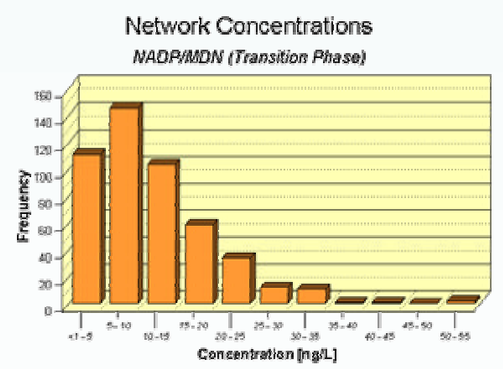


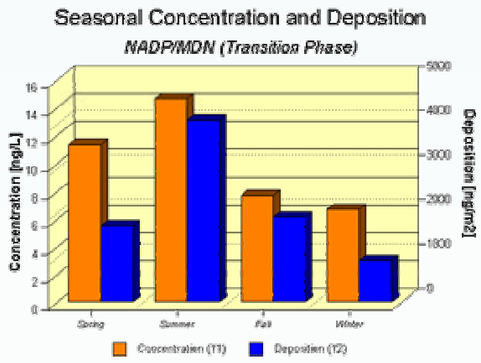












Conclusions

The results indicate that PA MDN sites show average Hg deposition values that are in the intermediate range when compared to the national averages. The PA37 levels were not significantly different from other PA sites except for PA90 located in Tioga County. There is not enough information to explain the differences.

The upwind sites (IN, SC and AL) also show higher deposition sites than PA37 and other PA sites. There is not enough information to determine if there is any regional transport of mercury from these locations that may impact the PA levels.

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