

Location and view of the Beltsville atmospheric monitoring site.

## Introduction

The U.S. EPA Clean Air Markets Division (CAMD) and the NOAA Air Resources Laboratory (ARL) have established a comprehensive atmospheric mercury monitoring site (39.0284° N, -76.8172° W) near Beltsville, Maryland, on the campus of the USDA Beltsville Agricultural Research Center, and bordering the

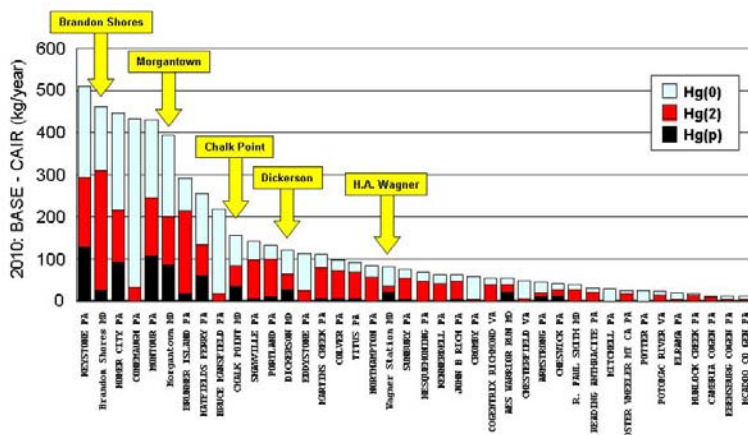


U.S Fish and Wildlife Service's Patuxent National Wildlife Refuge (NWR). The site is located on parkland embedded within a suburban portion of the Washington, DC metropolitan area, and is representative of much of the semi-urban nature of the Chesapeake Bay watershed. Other collaborating organizations at the site include the State of Maryland Department of Natural Resources and the University of Maryland. The Howard University Atmospheric Observatory, a multi-agency research facility for the study of atmospheric physics and chemistry, lies approximately 5 km to the northwest.

The Beltsville site includes two Tekran speciation systems, sampling asynchronously, for truly continuous measurements of  $Hg^0$ , RGM, and  $Hg_{(p)}$ . Mercury compounds, ancillary trace gases ( $SO_2$ ,  $O_3$ ,  $CO$ ,  $NO$ ,  $NO_Y$ ), and meteorological parameters are measured at a height of 10 m to minimize local surface effects. The site also hosts measurements under the EPA CASTNet, NADP/NTN (major ions in precipitation) and MDN (mercury wet deposition) programs. These existing co-located measurements were an important factor in choosing the Beltsville location for enhanced mercury monitoring.

In addition, the site:

- is characterized by relatively simple terrain and a good sampling “fetch”, facilitating the estimation or direct measurement of dry deposition fluxes;
- is useful for understanding both background and source-impacted concentrations, depending on the meteorological conditions;
- is surrounded by a wide variety of emission sources in the region, including several large waste incinerators and coal-fired electrical generating units;
- will be particularly useful for tracking the reductions in mercury emissions arising from the full implementation of the Clean Air Interstate Rule (CAIR) as well as other potential regulations. Several of the coal-fired power plants in the region are projected to undergo some of the most significant mercury emissions reductions under CAIR.



Coal-fired power plants in MD, VA, PA, and DE with the largest projected differences between 2010 base and 2010 Clean Air Interstate Rule (CAIR) emissions.

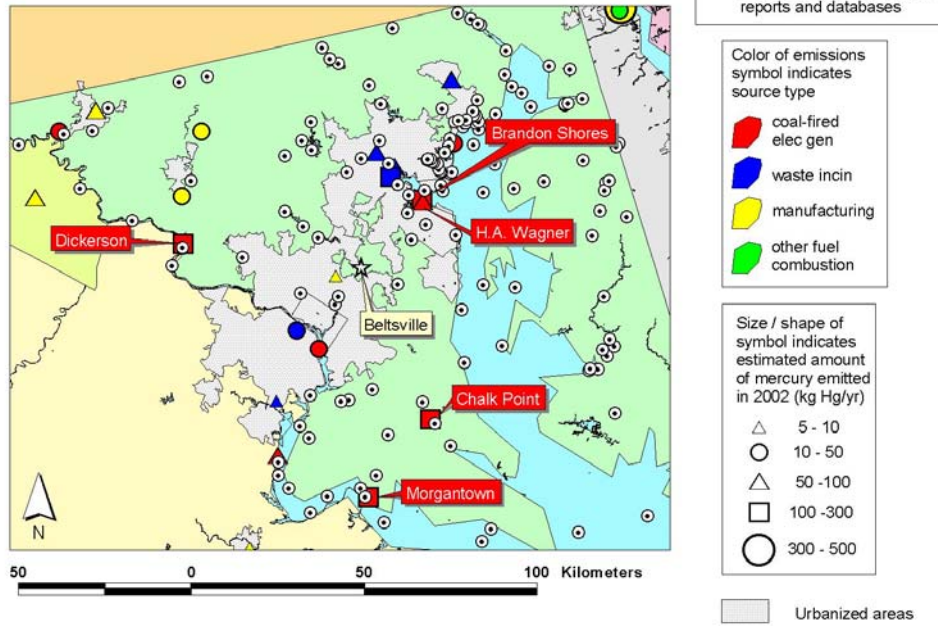
## Ecosystem Research

The Beltsville site abuts the Patuxent Research Refuge, the nation's only NWR established to support wildlife research, and is very near to the USGS Patuxent Wildlife Research Center (PWRC). Researchers at the PWRC have developed a searchable database of contaminants-oriented ecosystem research projects throughout the U.S., and participate in the Biomonitoring of Environmental Status and Trends (BEST) program, a long term ecosystem monitoring program designed to characterize and assess the effects of contaminants on biological and ecosystem resources. In addition, numerous studies of the extent and effects of metallic and hazardous organic contaminants in the state, conducted or sponsored by the Maryland Department of the Environment, have resulted in an extensive database from which “baseline” conditions may be established.

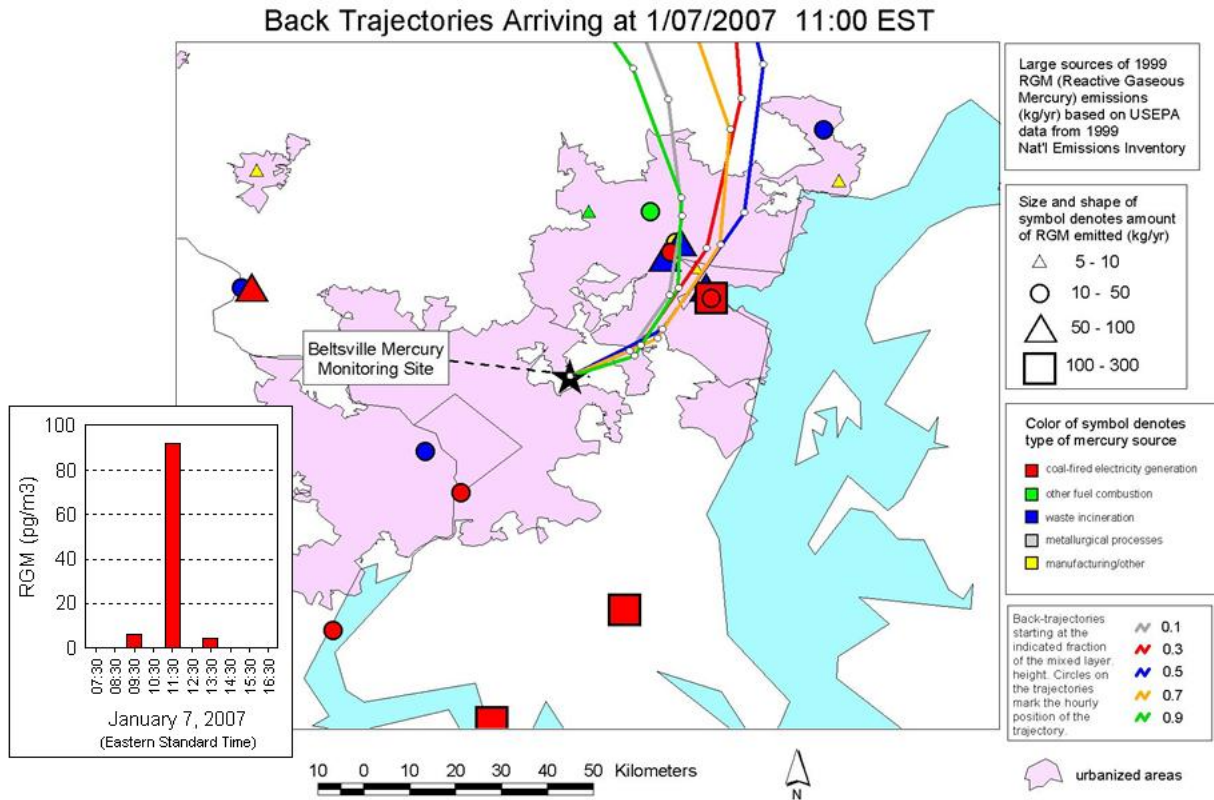
### For more information, please contact:

David Schmeltz: Schmeltz.David@epamail.epa.gov  
 Mark Cohen: Mark.Cohen@noaa.gov  
 Winston Luke: Winston.Luke@noaa.gov

Preliminary Assembly of Past Ecosystem Mercury Measurement Locations in the Vicinity of the Beltsville (MD) Atmospheric Mercury Measurement Site



Map showing the location of the Beltsville site in relation to the sites of mercury measurements in fish and other media, sponsored or conducted by the Maryland Department of the Environment. Labeled local sources are those scheduled to undergo the some of the largest emissions reduction under the CAIR rule.



Map showing the location of the Beltsville site in relation to major point sources in the region. Inset graph shows a time series plot of RGM concentrations at the site on January 7, 2007. Concentrations peaked between 1100-1200 EST on this day. The modeled back trajectories show that the site was under the influence of local source emissions at the time of the peak.