

Developing a State-Wide Mercury Monitoring and Assessment Program

Introduction

In response to concern over elevated levels of methylmercury in fish tissue from catches in the state's fresh water rivers and streams, a monitoring and assessment program has been developed to understand the sources, transport, transformation, deposition, biogeochemistry and assimilation of mercury.

Reports from these studies are available at <http://www.dnr.state.md.us/baypprp>

John Sherwell
Power Plant Research Program
Department of Natural Resources
Annapolis, MD 21401

Cooperators

ADA-ES
ERM
Frontier Geosciences
UM CES
UMCP

Sheila Glesman
Mark Garrison
Eric Prestbo
Mark Castro
Jeff Sehr

SERC
MD DNR
Utah State U
RFF

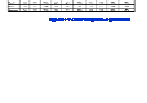
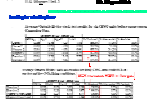
Cindy Gilmour
Tony Prochaska
Paul Jakus
Alan Krupnick

Source Characterization

Mercury Sources in Maryland

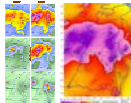


Testing at power plants
- emissions
- process analysis



Atmospheric Processes

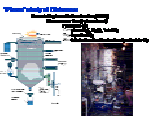
1 - Modeling CALPUFF-Hg



Modeled loading to the Chesapeake Bay

Developing a 10-year modeled deposition climatology

2 - Measurement



Summary of Findings

Mercury emissions from power plants are the dominant source of mercury to the Chesapeake Bay. Mercury emissions from power plants are the dominant source of mercury to the Chesapeake Bay. Mercury emissions from power plants are the dominant source of mercury to the Chesapeake Bay.

Ambient Studies

1 - Near-field dep

Monitoring Locations



- significant dry deposition of RGM & PM
- see gradients in downwind wet dep
- most mercury emitted not seen in the sampling

2 - Regional Monitoring

- Specialized mercury monitoring at Piney Reservoir (Frostburg)
- Manage data archive for detailed atmospheric chemistry at Frostburg & Beltsville

3 - NADP

Operate two MDN sites
Beltsville (MD09)
Piney Reservoir (MD08)



Biogeochemistry

1 - Methylation



Biogeochemistry research... Methylation... Biogeochemistry research... Methylation... Biogeochemistry research... Methylation...

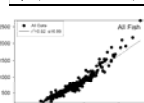
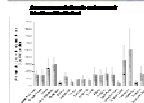
2 - Transport



Deposition-to-fish study. Wet dep input with YoY white perch as end point. One year of monitoring complete.

Fish Studies

1 - Reservoirs



2 - YoY



Take advantage of ongoing young-of-year surveys.

Socioeconomics

Impact of consumption advisories

Estimate three key endpoints
- Welfare losses to recreational anglers
- Welfare losses to consumers and producers of commercial striped bass
- Health benefits to recreational anglers due to reduced mercury uptake

Modeling FCA model



Health effects module



Brief summary
Rec fishing losses \$8.83M
Com fishing losses \$0.52M

Health benefits*
Men & women \$25.63M
Men only \$16.36M
*benefits literature for low level exposure is sparse.