

**CBP Goal Implementation Team
Water Quality Goal Implementation Team
Toxic Contaminants Workgroup
Meeting Minutes**

Date: Wednesday, April 10

Time: 1-3:00 PM

Calendar Page: [Link](#)



Agenda Item and Desired Outcome	Time	Background Docs, Notes, and Action Items
1. Introductions • Reminder of workplan commitments on mercury	1:00	
2. Mercury in Maryland Ecosystems —Andrew Heyes, UMCES	1:10	• Presentation
3. Mercury Trends in Fish Tissue: Maryland’s Young of the Year Study —Len Schugam, MDE	1:40	
4. Jurisdiction and agency Round-Robin • Opportunity for jurisdictional updates on mercury monitoring and trends; TMDL planning • Other efforts	2:10	
5. Discussion of Next Steps to Carry Out Workplans • Concept for Mercury Story Map (Michelle Williams, CRC and Greg Allen, EPA) • Do trends indicate a need for additional management actions?	2:30	
Wrap Up and Adjourn	3:00	

1. Introductions and Announcements:

- Marel King: PFOS has been banned in training for firefighting in VA—new bill passed in VA legislature. PFOS is an agenda item for June CBC meeting. There is emerging PFOS contamination being found in drinking water in Harrisburg VA. MD has also passed an EPS foam food ban, and a similar bill has been introduced in VA.
- Len Schugam: For PAHs, a bill was introduced in the MD House to ban coal tar sealants.

2. Mercury in Maryland Ecosystems —Andrew Heyes, UMCES

- Management questions for Hg include caveats of global climate change, land use changes, etc.
- Looking at YOY fish studies to determine Hg accumulation over time in fish hatched that year—includes several lakes and reservoirs in MD. However, there is uncertainty in water conditions, source food Hg concentrations.

- Factors that control methylmercury in biota are limited conditions to favor Hg-methylating bacteria and the process is complex. Sulfate availability limits methylation, and sulfide in anoxic environments binds to Hg and limits methylation.
- Description of study of MeHg fate and transport in two experimental watersheds. Competition between nitrate-reducing bacteria vs sulfate reducing (MeHg-producing)—competition for carbon sources. Forested watersheds are nitrate-limited so there is higher MeHg production in the forested watershed than the agricultural watershed.
- There is still uncertainty in understanding flux in MeHg loads to Chesapeake Bay. Unsure how representative experimental watersheds are of Chesapeake Bay flux.
- Unsure how hypoxic/anoxic volume in stratified Bay impacts MeHg production. Initial results of experimental study indicate that aeration correlates with higher MeHg concentrations in water. However, unsure of aeration effects on fish accumulation.
- Also finding that selenium and MeHg have negative trends—higher Se means lower Hg in fish.
- Mark Cohen asked about hypothesis for selenium inhibiting Hg uptake, and where the debate is going for selenium vs Hg uptake.
 - Andrew Heyes: There have been no studies in humans. There are a couple studies looking at Se dosing in fish but Se is tricky because its toxicity builds quickly with small increases in body burden.
- Len Schugam suggested if it is possible to incorporate water data into the YOY studies to look at water loadings vs fish body burden.
- Tom Barron asked about underlying geology in watersheds, and the groundwater connectivity, and the glauconitic layer.
 - Heyes: The two watersheds have different geologies. The forested watershed is fairly connected because there is an impervious layer under the groundwater table. The ag watershed is more complicated, and that is older water from groundwater that flows into that stream. We don't have funding yet to look at that, but we are working on it.

3. Mercury Trends in Fish Tissue: Maryland's Young of the Year Study--Len Schugam, MDE

- Len Schugam: The YOY study is inconclusive, and we did not expect to see a decline in loadings post-2013. We also wonder if there is growth dilution of Hg concentrations in larger fish. We are seeing reductions in air deposition, but there may be a lag to see that in the fish. The Savage River reservoir has very high MeHg levels. A lot of the YOY data was intended to provide information for the TMDL development. However, we are seeing lower levels in the channel catfish and smallmouth bass that were driving the original listings. While YOY study is not showing clear trends, we are seeing some reductions in Hg in other fish. So, we are planning to delist some segments in MD for Hg. We will make a new determination for the 6 remaining listings in the fall to determine if a TMDL is still needed. We will still be monitoring, but we are holding off on TMDL development until we have more information from fish tissue data in the fall. There are TMDLs for some impoundments that were developed in 2011. The original goal was to develop a regional TMDL for these reservoirs in Western MD, and we have a preliminary plan in place to develop the TMDL. However, if there are still persistent listings beyond this year, we will go back to the TMDL approach. There are currently 20 listings, 10 TMDLs developed for lakes and reservoirs. The remaining listings without TMDLs are in free-flowing river systems.
- Mark Cohen asked what the criteria for listing.
 - Schugam: We consider .3 ppm for a listing threshold that would trigger TMDL development.
 - Cohen: Recent studies show that toxicity to humans is greater than we previously thought. The listing thresholds are based on that old data, which may be off by an order of magnitude. I will send you some papers on the updated literature.
 - Schugam: I'd be interested in doing that. From a management view, is there anything on the watershed management side that is on the table? Currently all Hg control efforts are focused on controlling air emissions.
- Doug Austin: EPA may reassess the oral reference dose for Hg—there is a public comment period open for that, and there will be a webinar May 15 with some more information.
- Mark Cohen: There is a paper that summarizes the issues with the oral reference dose (ORfD) from 2017, I'd be happy to share that with the group.
 - Michelle Williams: I can share that with the group.

4. Jurisdiction and Agency Round-Robin

- Mark Richards: We have developed TMDLs where we know of direct sources of Hg, but we have several impairments with indirect sources. We have not been working on Hg fish tissue monitoring between 2008 and 2017. Recent studies show no decline in fish tissue concentrations from 9 years ago, so there have not been any declines. It's too early to know if there are any trends, however. There is additional work in the estuary with annual probabilistic monitoring, targeting Hg among other things. Don Smith works on this. In 2016 they did a 10-year revisit from 2006 to 2016 for a trend analysis, found a statistically significant decrease in Hg in the sediment. Looking again in 2018, the trend disappeared. In VA we are still unsure what the trends might be. We are discussing now to determine if a TMDL is needed and how that might be developed.
- Mark Cohen: There are a lot of large power plants in the vicinity of the impaired area East of 95--could that be a source of the impairment?
 - Richards: That's a possibility. There was also an auto-recycling plant in that area that could also be contributing to the contamination.
- Greg Allen asked if there is available wet and dry deposition data.
 - Richards: We do not have very robust air monitoring data. MD has air data, and there are a couple monitoring stations in North Carolina, so between the two of them we might be able to interpret some trends in VA. We've talked about the hg issue with our air monitoring department, and they were very confident that the issue would be solved with control of power plants and controlling point sources.
- Richards: In the Shenandoah, there is a land resource contamination research project going on at the DuPont site. They are attempting restoration, reducing methylation, etc, but that might be interesting to look into.
 - Phillips: That would be good to follow up with in terms of additional management actions.
- Amy Williams: Our 2018 report is being prepared. There are a couple of new Hg impairments, but we still need to do our fish tissue monitoring.
 - Barron: There is still a Hg advisory for channel catfish and flathead catfish in the Susquehanna through all of PA. Our fish tissue monitoring is on a 5-year rotation, so we are not well set up for monitoring for trends. We are also not sure what the air monitoring in PA is doing, we need to follow up with them.
- George Onyullo: We have an existing TMDL for Rock Creek in DC but no additional Hg work so far. DC does not have robust monitoring data for DC, so we don't know what trends are happening.
- John Wirts: WV has no impairments in Chesapeake watershed, some in reservoirs in western WV, but no plans right now to develop TMDLs. We have 0.5 ppm criteria.
- John Cargill: DE doing comprehensive studies on all Chesapeake drainages. In 2017 fish tissue data shows 1 out of 12 composite fish samples exceeded our screening value of 0.3 ppm. We will go back to collect additional composite samples to confirm that result. Mostly largemouth bass, and a couple catfish. The 2006 study had 2 out of 10 samples that exceeded the screening level. There needs to be more monitoring in the Nanticoke watershed (Marshyhope Creek) to determine if a listing is necessary.
- Scott Phillips asked if any jurisdiction is not taking the air deposition control approach for emissions?
 - Allen: We have convincing evidence that air deposition is the major source of hg deposition. I wanted to know what air monitoring stations we have for data
 - Mark Cohen: air emissions are extremely spatially heterogeneous. Having just a few monitoring stations gives you a general regional background, but you need a modeling approach to complement the monitoring. I would caution states that even if you just have just a couple monitoring stations for wet deposition, keep those going and it is possible to develop modeling approaches to complement that data.
 - Austin: What is the value of the paired sediment data with the fish tissue?

- Heyes: Sediment data needs to be dated to be useful. You may get sediment data from this year, or you could get a scour event.

5. Discussion of Next Steps to Carry Out Workplans – Michelle Williams, CRC

- George Onyullo suggested adding air monitoring station coverage to the story map.
 - Mark Cohen: you could include that with emissions trends on the map. There are a number of sources—EPA and the states have inventories, and EPA often gets data from the states.
- Scott asked to include air monitoring stations and monitoring data in the story map, in addition to water quality impairment and TMDL mapping.

Call Participants:

Greg Allen, EPA CBPO
 Scott Phillips, USGS
 Michelle Williams, CRC
 Doug Austin, EPA CBPO
 Emily Majcher, USGS
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