



**Maryland**  
Department of  
the Environment

# **Bridging the Stream**

## **A Collaborative Pathway to MD's Freshwater Ammonia Criteria Adoption**

ACWA Water Quality Standards Workshop

Matt Stover

Tuesday, April 21, 2026

Little Rock, AR



# Acknowledgements

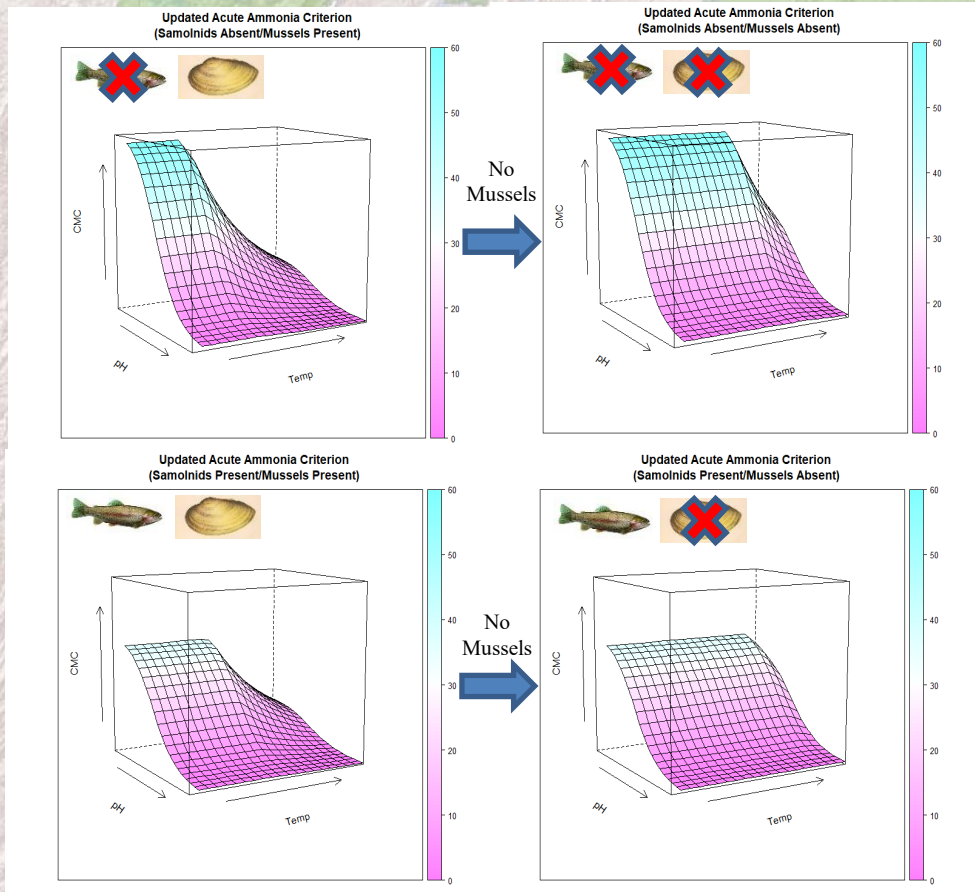
- Former coworker Timothy Fox was the driving force behind MD's adoption of these criteria.
  - Now at the Massachusetts Dept of Environmental Protection (TMDL Program)
- MD DNR – Data collection and review of proposals to ensure adequate protection for Maryland's mussel community



Photo courtesy of Matthew Ashton, MD DNR



# Freshwater Ammonia Criteria to Protect Aquatic Life



- EPA published updated 304(a) Ambient Water Quality Criteria in 2013
- More stringent than 1999 and 1985 criteria b/c they incorporate updated toxicity data (mussels)
- Criteria magnitude expressed as a function of pH and temperature



# Concerns with MD's Adoption of Criteria

- Municipal Wastewater Assoc. Group submitted comments re: concerns with:
  - 1) costs of compliance
  - 2) desire for variance
  - 3) timeline for adoption
  - 4) avenues for relief, e.g., site-specific criteria
- Quoting analysis for WWTPs in VA estimating capital costs of >\$500 million and O&M of ~\$34 million anticipated similar costs in MD
- Began periodic meetings with their attorney and Board to keep them updated on our work



Photo credit: Kristian Bjornard



# Key Advantages for Maryland

- Bay Restoration Fee (BRF) - \$60/yr per dwelling unit. This funds:
  - WWTP upgrades to ENR (TN:3mg/l, TP: 0.3mg/l)
  - WWTP O&M grants
  - BAT septic upgrades, and more
- MD's major (>0.5 MGD) WWTPs upgraded to ENR
- MD DNR has statewide database on mussels (random sampling method)

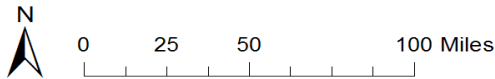
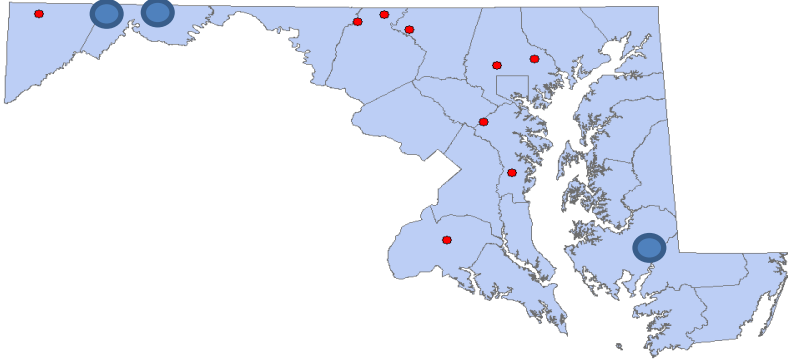


Photo courtesy of Matthew Ashton, MD DNR



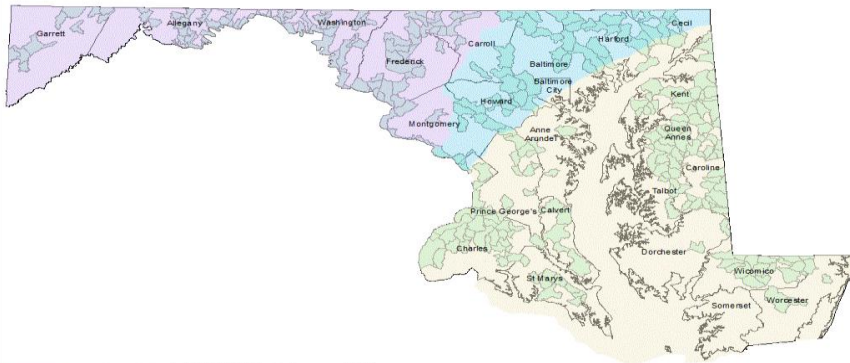
# Rolled up our Sleeves

Locations of WWTPs and Water Treatment Plants (blue dots)



MD MAP.DOT

Confirmed Freshwater Mussel Observations



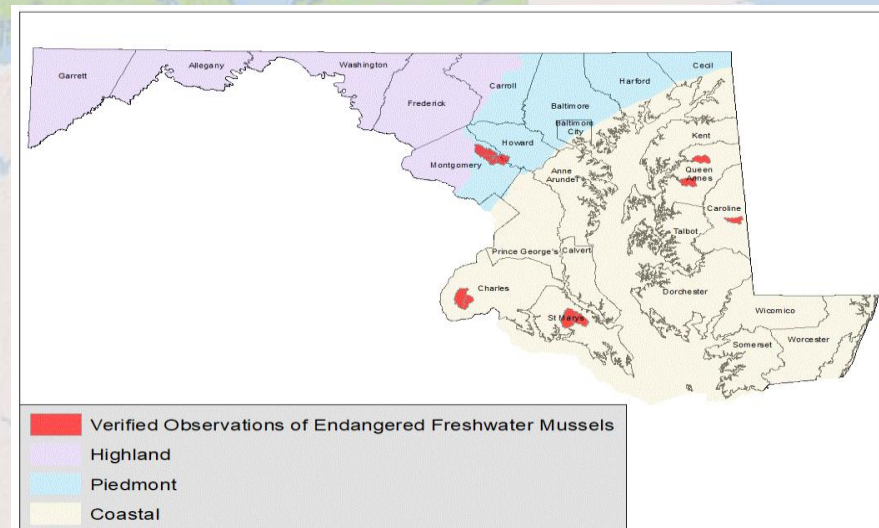
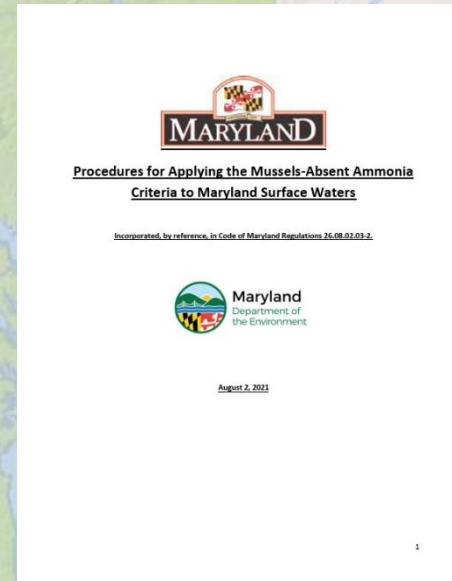
Highland  
Piedmont  
Coastal  
Fresh Water Mussels Observed

- Reviewed DMR data and conducted field study of chemical composition (including ammonia) at WWTPs discharge pts and up & downstream
- Analyzed mussel presence data with habitat to determine if we could predict where mussels would naturally not be found.
- NPDES permitting group developed options for establishing a statewide compliance schedule to phase in ammonia requirements



# Results of this Effort

- WWTP Study showed low occurrence of discharges exceeding 2013 criteria
  - ENR plants already meeting criteria
- Developed model for predicting presence of mussels based on 4 abiotic factors (flow) – Used this to develop procedures for applying Mussel-absent ammonia criteria
- NPDES group created a compliance schedule for plants based on their existing treatment process
- Regularly met and shared our thinking/progress on these tasks with Municipal Wastewater Association





# Proposal and Adoption

- 2013 criteria and Procedures for Applying Mussel-absent criteria proposed in MD's Triennial Review (2022)
- Oppositional comments to ammonia criteria were softened and mainly directed towards subjects related to implementation in NPDES permits
- Approved by EPA in 2023



Photo taken by Matt Stover, Maryland Dept. of the Environment

- [Link to Procedures](#)



# Keys to Criteria Adoption

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- Forward-looking legislation
  - Bay Restoration Fund (passed in 2004)
- Robust mussel dataset - MD DNR
- Regular Communication + Active Listening = Stakeholder's Trust
- Going the extra mile to make sure the most appropriate criteria are applied



# Contact Information

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