

Conowingo Dam Relicensing



*Tidal Fisheries Advisory
Commission Meeting
February 21, 2014*



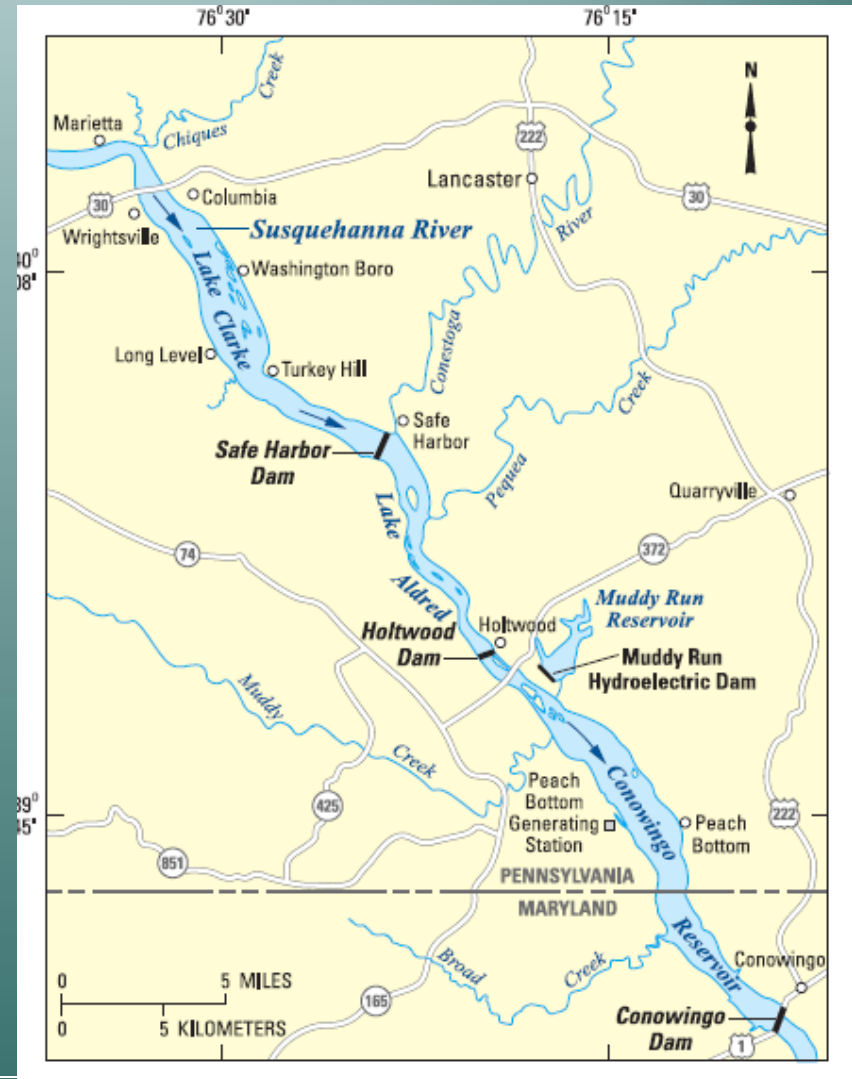
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Natural Resources
Power Plant Research Program*

Presentation Outline

- Susquehanna River Hydroelectric Relicensing
 - FERC Relicensing Activities
 - FERC-Approved Environmental and Socioeconomic Studies
 - Issues Identified for Protection, Mitigation and Enhancement
 - Water Quality (sediment, nutrients and other pollutants)
 - Lower Susquehanna River Watershed Assessment Study
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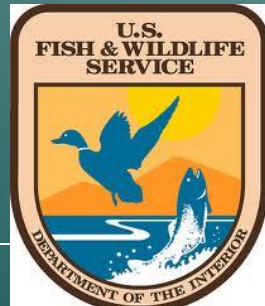
Susquehanna River Hydro Relicensing

- Conowingo Dam
-- expires 2014
- Muddy Run (Pump/Storage)
– expires 2014
- Holtwood Dam
– amended to 2030
- Safe Harbor Dam
– expires 2030
- York Haven Dam
– expires 2014



Relicensing Participants

- Federal Energy Regulatory Commission (FERC)
- Exelon – Applicant / Owner
 - ▶ Conowingo & Muddy Run
- York Haven Power – Applicant / Owner
 - ▶ York Haven
- Maryland – DNR & MDE
- Pennsylvania – PADEP, PAFBC
- USFWS / NOAA / NMFS
- National Park Service (NPS)
- Susquehanna River Basin Commission (SRBC)
- The Nature Conservancy (TNC)
- Lower Susquehanna Riverkeeper



FERC Relicensing Activities

(to date)

- 2009
 - Exelon Filed Pre-Application Document
 - ▶ Maryland participated in the development of all study plans
 - ▶ FERC approved a total of 32 studies
 - ▶ Exelon conducted studies between 2010 and 2012

 - 2012
 - Exelon Filed Final License Application (FLA)
August 31, 2012

 - 2013
 - FERC Issued Ready for Environmental Assessment (REA)
April 29, 2013

 - 2014
 - Prescriptions, Recommendations and Comments filed with FERC on the Final License Application
January 31, 2014
(Maryland filed comments)
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Studies Approved by FERC

- 3.1 Seasonal and Diurnal Water Quality in Conowingo Pond and below Conowingo Dam
 - 3.2 Downstream Fish Passage Effectiveness Study
 - 3.3 Biological and Engineering Studies of American Eel at the Conowingo Project
 - 3.4 American Shad Passage Study
 - 3.5 Upstream Fish Passage Effectiveness Study
 - 3.6 Conowingo East Fish Lift Attraction Flows
 - 3.7 Fish Passage Impediments Study below Conowingo Dam
 - 3.8 Downstream Flow Ramping and Fish Stranding Study
 - 3.9 Biological and Engineering Studies of the East and West Fish Lifts
 - 3.10 Maryland Darter Surveys
 - 3.11 Hydrologic Study of the Lower Susquehanna River
 - 3.12 Water Level Management (Littoral Zone and Water Level Fluctuation)
 - 3.13 Study to Assess Tributary Access in Conowingo Pond
 - 3.14 Debris Management Study
 - 3.15 Sediment Introduction and Transport (Sediment and Nutrient Loading)
 - 3.16 Instream Flow Habitat Assessment below Conowingo Dam
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Studies Approved by FERC (Continued)

- 3.17 Downstream EAV/SAV Study (Water Level Vegetative Cover Study)
 - 3.18 Characterization of Downstream Aquatic Communities
 - 3.19 Freshwater Mussel Characterization Study below Conowingo Dam
 - 3.20 Salinity and Salt Wedge Encroachment
 - 3.21 Impact of Plant Operations on Migratory Fish Reproduction
 - 3.22 Shortnose and Atlantic Sturgeon Life History Studies
 - 3.23 Study to Identify Habitat Use Areas for Bald Eagle
 - 3.24 Dreissenid Mussel Monitoring Study
 - 3.25 Creel Survey of Conowingo Pond and the Susquehanna River below
Conowingo Dam
 - 3.26 Recreational Inventory and Needs Assessment
 - 3.27 Shoreline Management
 - 3.28 Archaeological and Historic Cultural Resource Review and Assessment
 - 3.29 Effect of Project Operations on Downstream Flooding
 - 3.30 Osprey Nesting Survey
 - 3.31 Black-crowned Night Heron Nesting Survey
 - 3.32 Re-evaluate the Closing of the Catwalk to Recreational Fishing
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Issues Identified for Protection, Mitigation and Enhancement

- Major Issues
 - ▶ Water Quality (sediments, nutrients and other pollutants)
 - ▶ Fish Passage (American Shad, river herring and American Eel)
 - ▶ Flow Regime (minimum flow, maximum flow, ramping rates)
 - ▶ Debris Management
 - ▶ Recreation and Lands
 - Other Issues
 - ▶ Rare, Threatened and Endangered Species
 - ▶ Shoreline Management
 - ▶ Archaeological and Historic Cultural Resources
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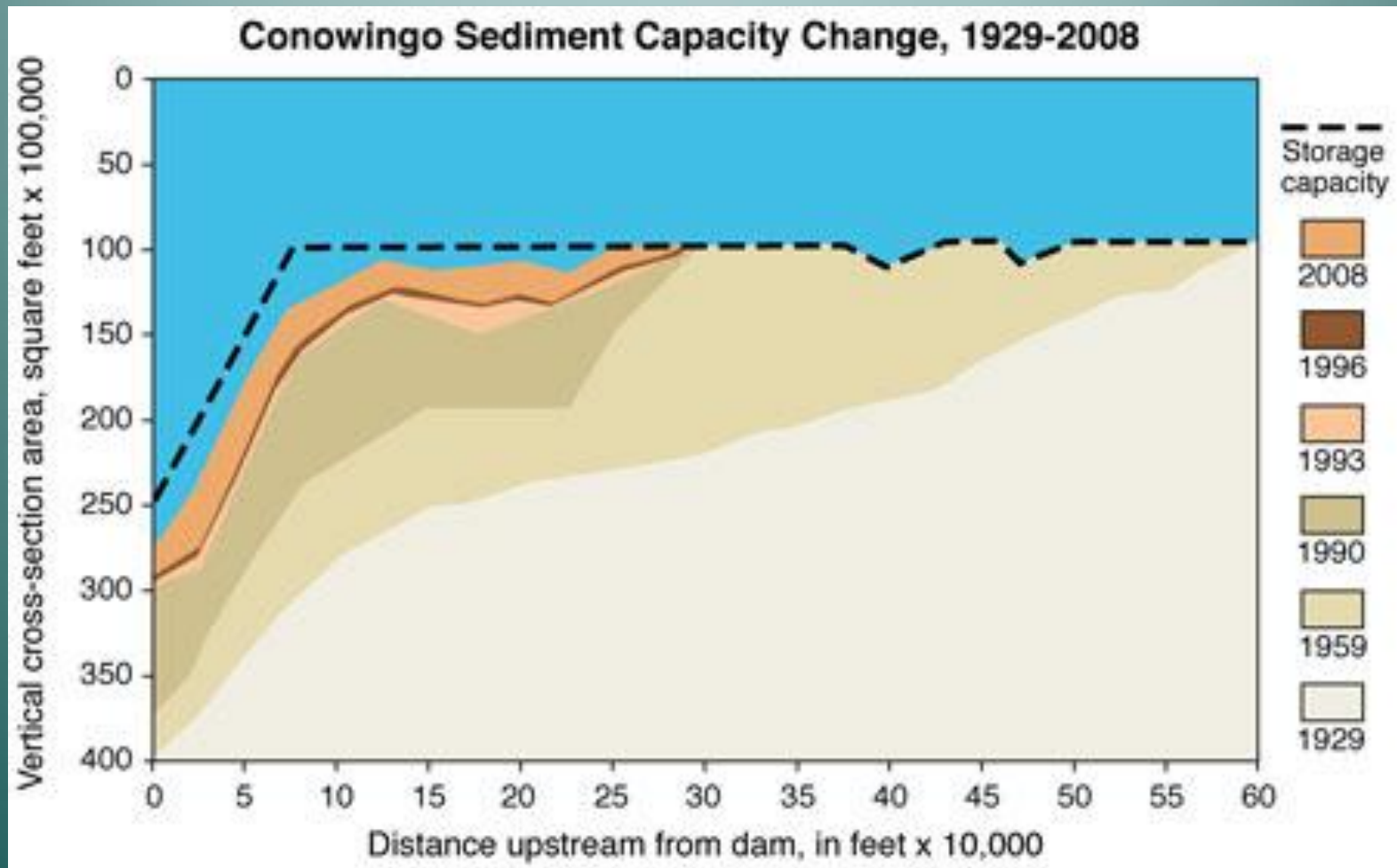
Water Quality

(sediment, nutrients and other pollutants)

- 3 million tons/year loading with 2 million tons/year captured
- Conowingo Dam Traps about 2% N, 40% P and 50-70% of suspended sediments
- Sediment Capacity at $\approx 86\%$
- 10-15 yrs of storage capacity?
- Tropical Storm Lee (2011) scoured ≈ 4 million tons of sediment / added about 2 yrs sediment capacity at 728,000 cfs
- Hurricane Agnes (1972) – largest single event at 1,100,000 cfs



Sediment



Source: USGS

Lower Susquehanna River Watershed Assessment Study

- Partners:
 - Army Corps of Engineers,
 - Maryland (MDE and DNR),
 - Susquehanna River Basin Commission, and
 - The Nature Conservancy
 - Cost: \$1.376 million
 - Cost sharing = 75% Federal, 25% non-Federal
 - Agreement executed September 2011
 - Study duration expected to be 3-years (mid to late 2014)
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Goals and Objectives

1. Evaluate strategies to manage sediment and associated nutrient delivery to the Chesapeake Bay.
 - Strategies will incorporate input from Maryland, New York, and Pennsylvania Total Maximum Daily Load (TMDL) Watershed Implementation Plans.
 - Strategies will incorporate evaluations of sediment storage capacity at the three hydroelectric dams on the Lower Susquehanna River.
 - Strategies will evaluate types of sediment delivered and associated effects on the Chesapeake Bay.
 2. Evaluate strategies to manage sediment and associated nutrients available for transport during high flow storm events to reduce impacts to the Chesapeake Bay.
 3. Determine the effects to the Chesapeake Bay due to the loss of sediment and nutrient storage behind the hydroelectric dams on the Lower Susquehanna River.
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Modeling Scenarios

1. Base Condition –

- Water Quality (WQ)/sediment accumulation rate under existing conditions.

2. Watershed Management –

- WQ/sediment accumulation rate after implementation of TMDL's.

3. What Happens when the Reservoir Fills –

- Impact on WQ/sediment accumulation rate to the Bay (assume TMDL's are being met).

4. Effect of Scouring during Winter/Spring Runoff –

- WQ/sediment accumulation rate with scouring of the bottom of a full reservoir (utilize Jan '96 event).
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Modeling Scenarios (cont.)

5. Effect of Scouring from a Tropical Storm –

- Same as Scenario 4 except event will occur in summer (substitute the Jan '96 event).

6. Reservoir Bypass –

- Impacts on WQ/sediment accumulation rates with a system bypassing sediment from behind Conowingo to below the dam.

7. Reservoir Strategic Dredging –

- WQ/sediment accumulation rate impacts from dredging fines in potentially any reservoir.

8. Modify Dam Operations –

- Effects of altering the flow and/or the way the Conowingo is currently operated.
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Activities Completed to Date

- ✓ Sediment Data Collection (sediment cores, suspended sediment water quality, grain size analysis)
 - ✓ Bathymetric Surveys
 - ✓ Sediment Characterization
 - ✓ Outreach Activities (project website, quarterly email updates, ...)
 - ✓ Literature Search for Potential Strategies – Watershed and Reservoir-Specific
 - ✓ Development of Hydraulic, Transport and Bay Models
 - ✓ Brainstorming of Available Alternatives
 - ✓ Modeling of Existing and Projected Conditions
 - ✓ Assessed Feasibility of Sediment Management Alternatives
 - ✓ Developed Rough Cost Estimates of Viable Alternatives
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Stakeholder Outreach

✓ Facebook Page:

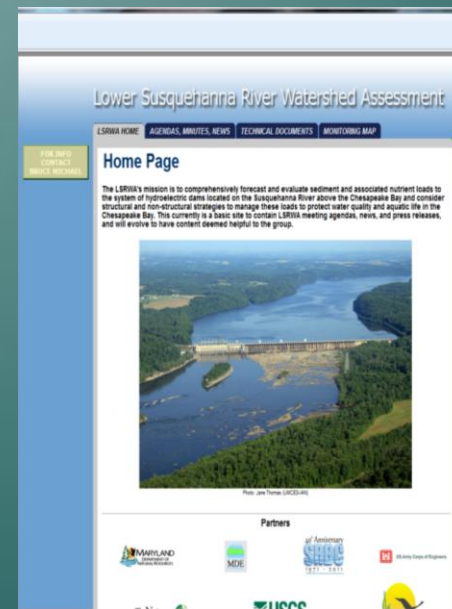
<http://www.facebook.com/pages/Lower-Susquehanna-River-Watershed-Assessment/359608094092593>

✓ LSRWA Website:

<http://mddnr.chesapeakebay.net/LSRWA/index.cfm>

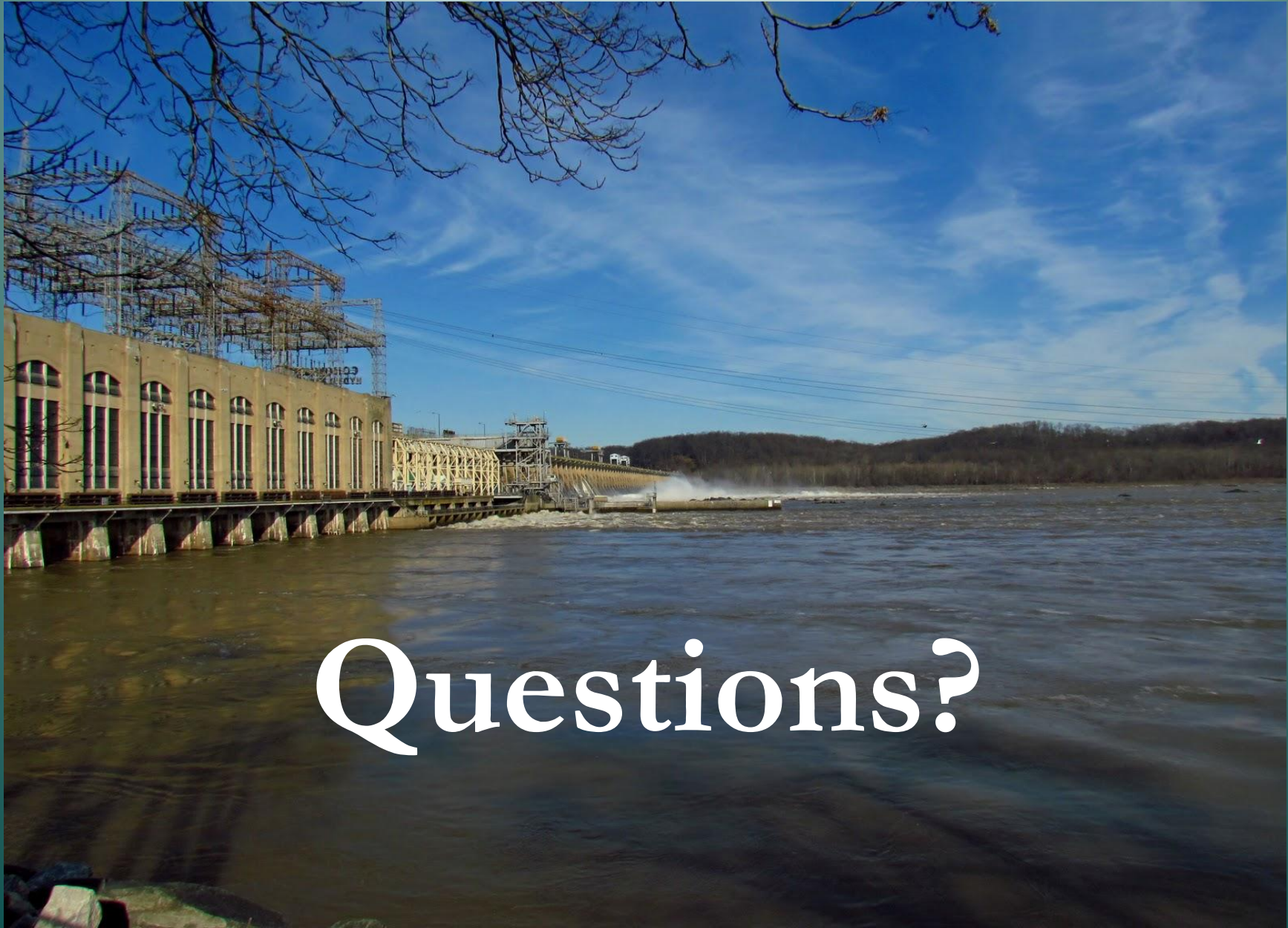
✓ Email updates:

send info to: bmichael@dnr.state.md.us



Next Steps

- LSRWA Work
 - ▶ Finalize Cost Estimates for Sediment Management Alternatives
 - ▶ Potential Public Meetings to Present Management Alternatives
 - ▶ Evaluate Potential Funding Opportunities
 - Address Outstanding Data Gaps
 - ▶ Proposed UMCES / USGS Study to Evaluate the Transport and Fate of Nutrients and their Impact on the Bay (≈ 3 years, depending on river flow)
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Questions?