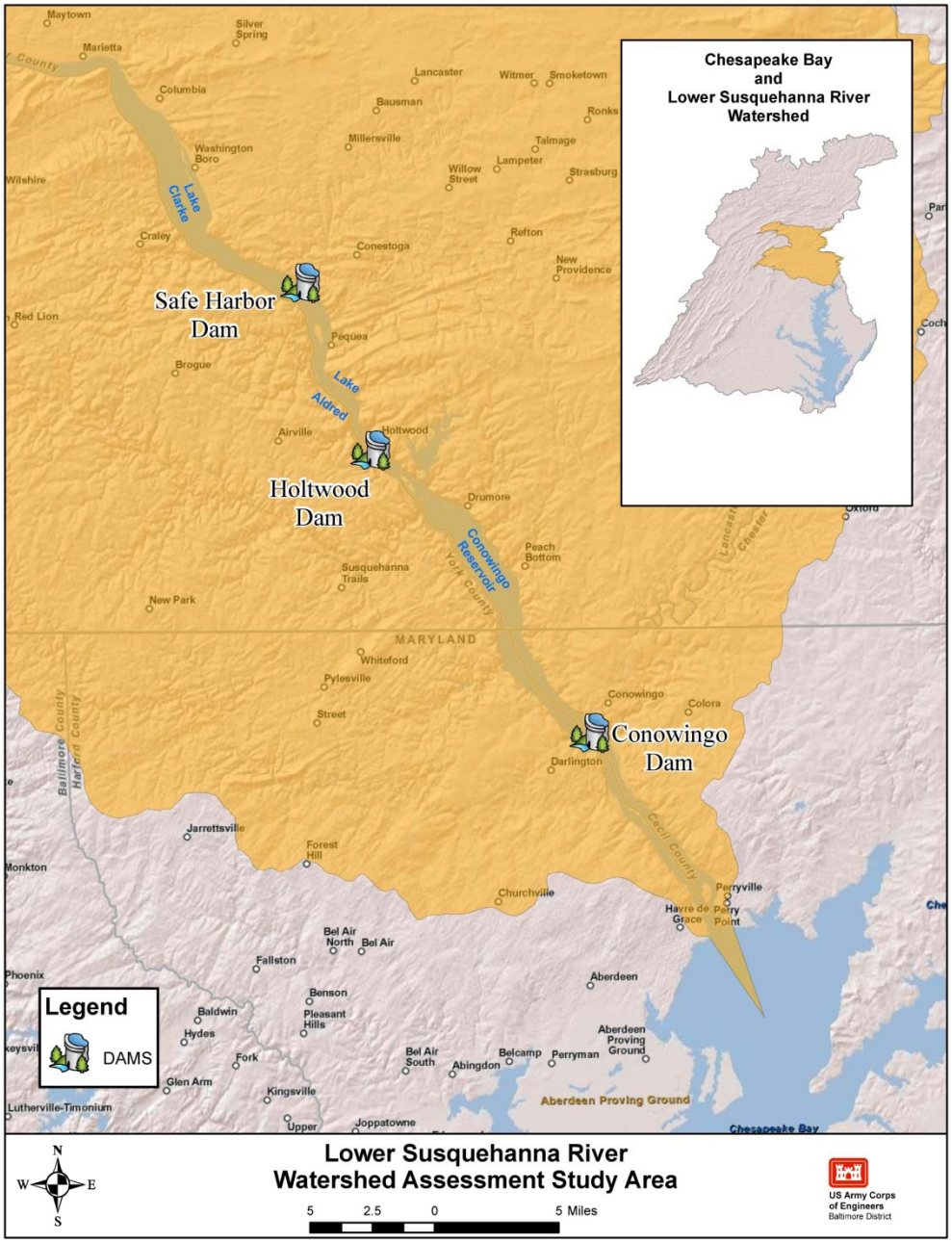
Conowingo Dam & Lower Susquehanna River Sediment

AMQAW Meeting
January 19, 2013



Presentation Outline

- Susquehanna River facts
- Impacts from high flow events – USGS Report
- Conowingo Dam Relicensing Process
- Lower Susquehanna River Watershed Assessment study

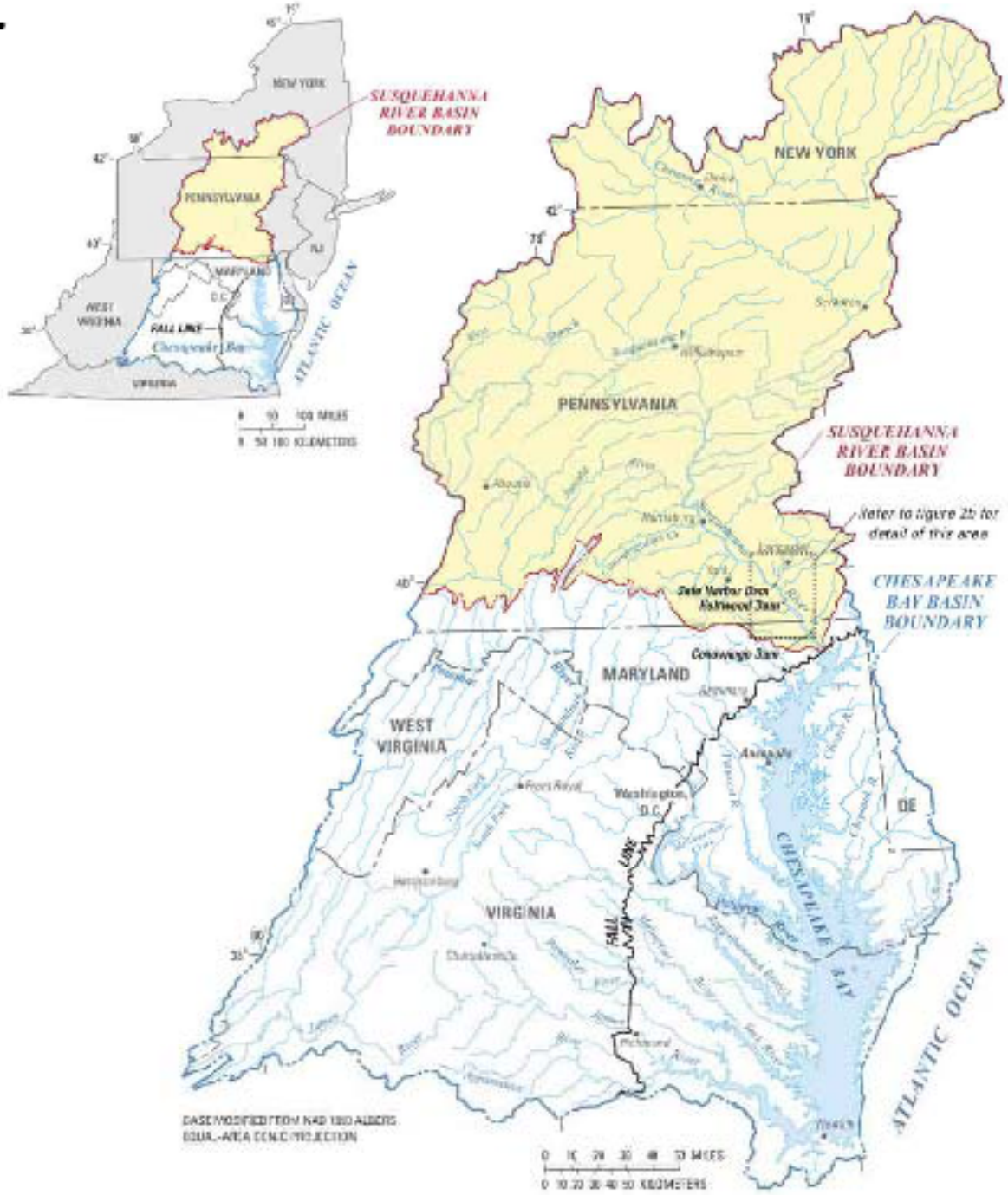
Susquehanna River As a % of Chesapeake Bay inputs

47% of freshwater

41% of nitrogen

25% of phosphorus

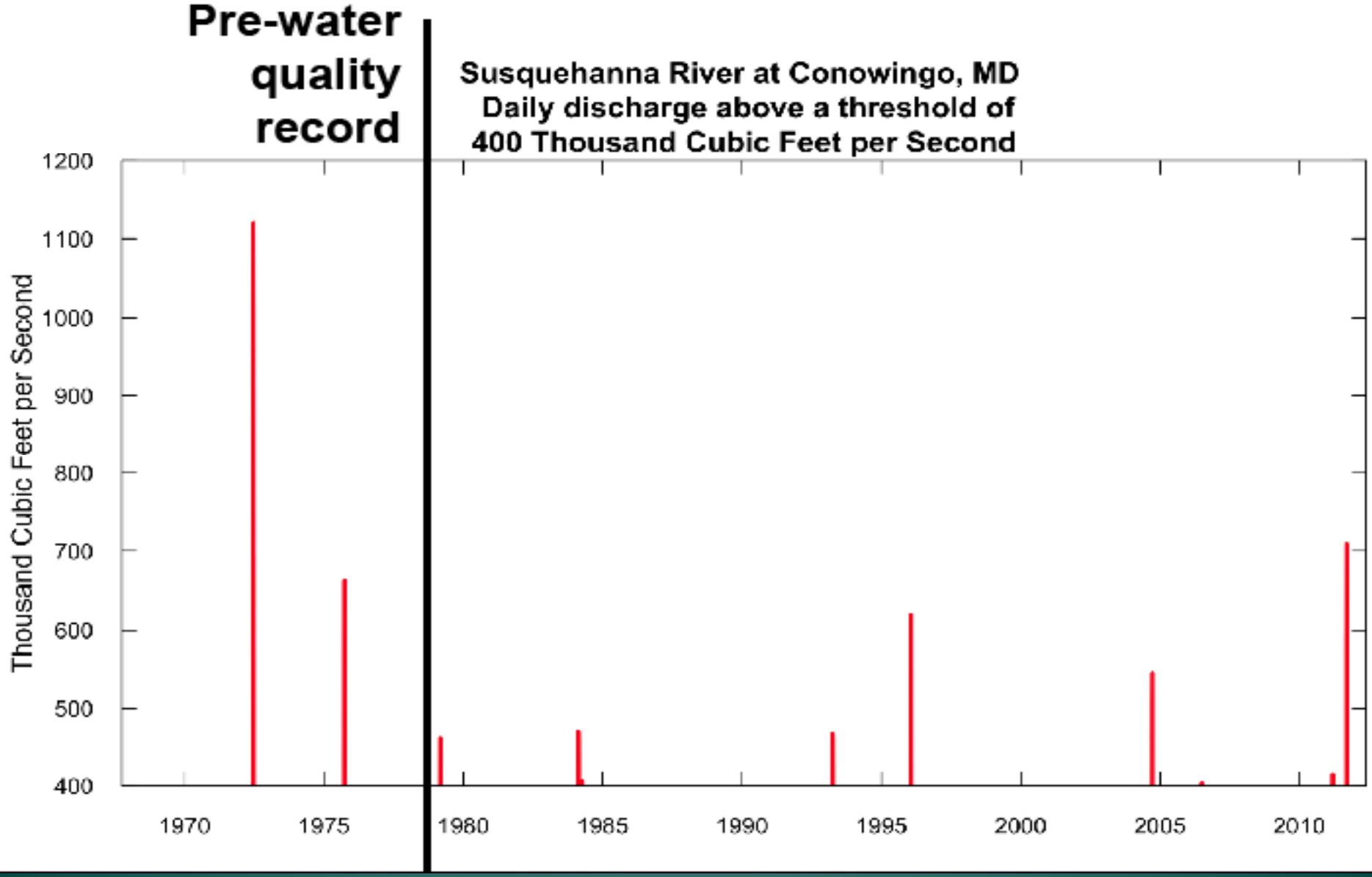
27% of sediment



Susquehanna River Sediment

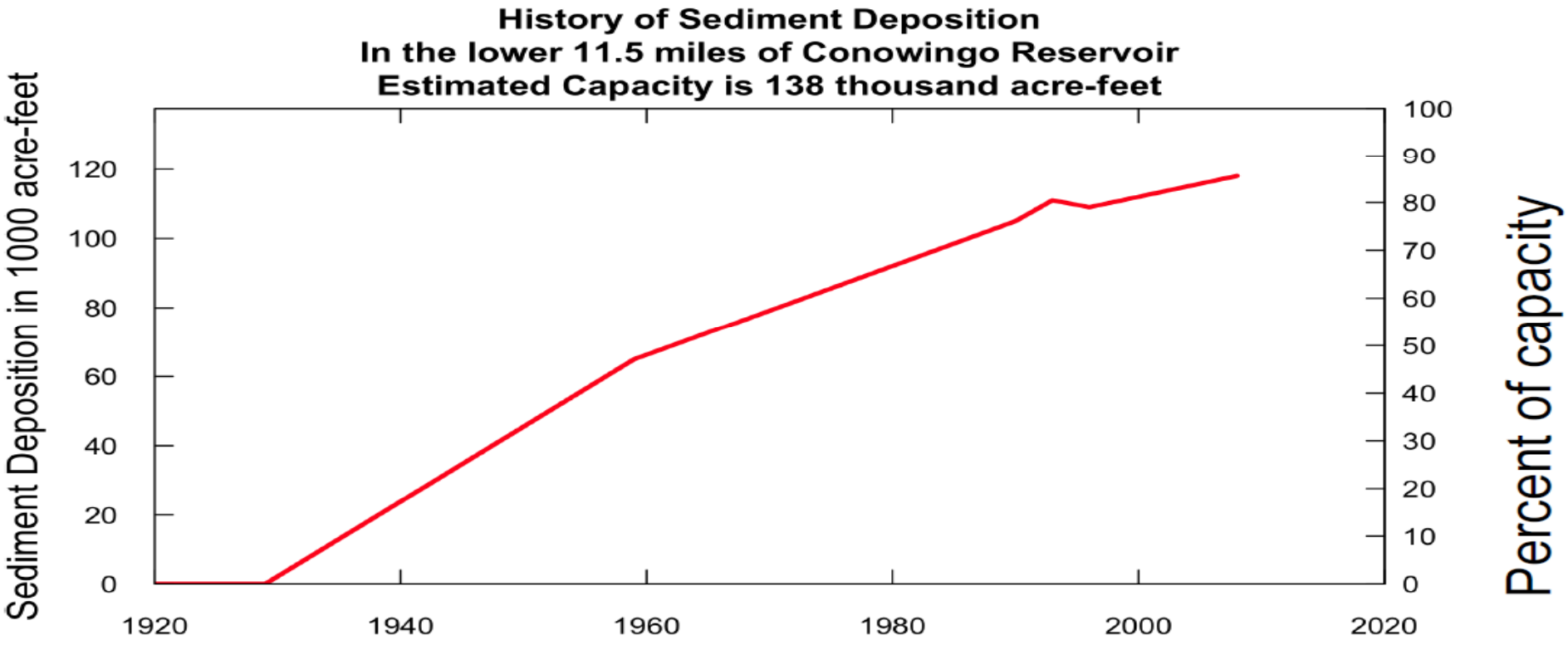
- 3 million tons/year loading with 2 million tons/year captured
- Conowingo Dam Traps about 2% N, 40% P and 50-70% of suspended sediments
- Sediment Capacity at ≈ 86%
- 10-15 yrs of storage capacity?
- Tropical Storm Lee (2011) scoured ≈ 4 million tons of sediment / added about 2 yrs sediment capacity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

How unusual was the Tropical Storm Lee event?



	T.S. Lee as a % of 2011	T.S. Lee as a % of last decade	T.S. Lee as a % of full record
Time	2%	0.2%	0.06%
Flow	12%	1.8%	0.6%
Total Nitrogen	31%	5%	1.8%
Total Phosphorus	61%	22%	9%
Suspended Sediment	78%	39%	22%

Sediment



Source: Langland, 2009
http://pubs.usgs.gov/sir/2009/5110/

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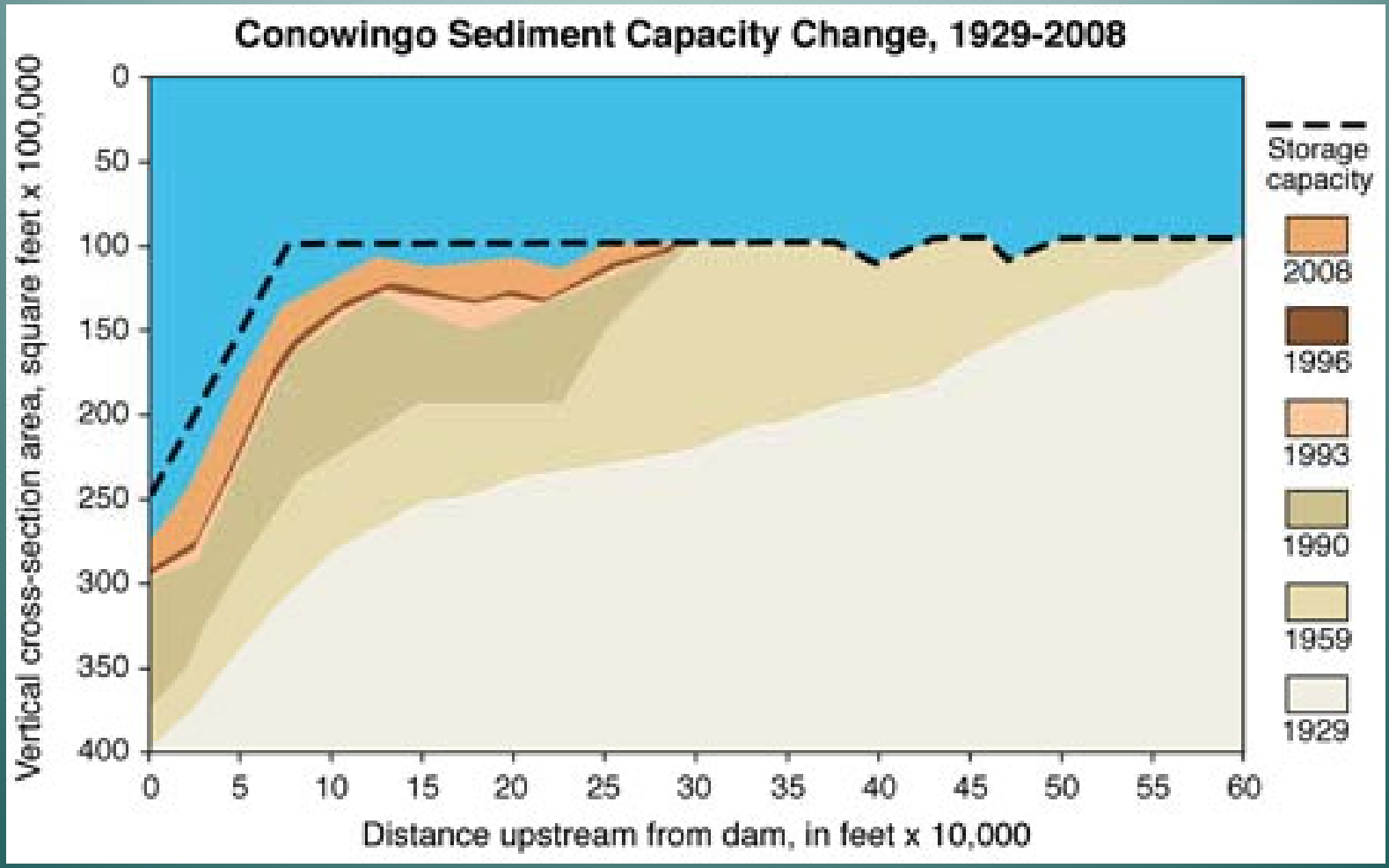
Sediment



Source: USGS

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Susquehanna River Dams

- 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 (Conowingo)

- Federal Energy Regulatory Commission (FERC)
- Exelon – Applicant / Owner
- 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's Relicensing Schedule

- Current license expires September 1st, 2014
- Exelon filed Pre-Application Document in 2009
  - ► performed 32 socioeconomic and environmental studies between 2010 and 2012
- Exelon filed Final License Application (FLA) 8/31/2012
    - FERC expected to issue Ready for Environmental Assessment (REA) in March/April 2013
    - Within 60 days following issuance of the REA, FWS must issue fish passage prescriptions;
- Initiated settlement negotiations October 10th 2012

Significant Relicensing Issues

High Priority

- Sediment Management
- Fish Passage
- Flow Management
  - fish stranding
  - downstream habitat
- Water Quality
  - freshwater mussels

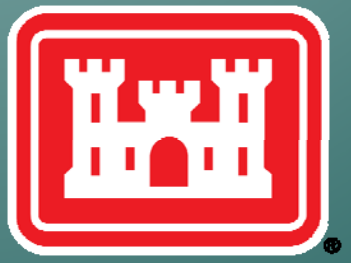
Moderate Priority

- Catwalk
- Debris Management
- RTE Species
- Land Conservation
- Recreation

Lower Susquehanna River Watershed Assessment Study

- Watershed assessment (Authorized by Section 729 of Water Resources Development Act of 1986)
- Cost: $1.376 million
- Cost-sharing sponsor = Maryland Department of the Environment with contributions from MD DNR, Susquehanna River Basin Commission and The Nature Conservancy
- Cost sharing = 75% Federal, 25% non-Federal
- Agreement executed September 2011
- Study duration expected to be 3-years

LSRWA Partners



- Each agency will be providing funding and/or conducting specific tasks for the assessment.

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.

Prospective 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).

Prospective 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.

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 the HEC-RAS Hydraulic Model
- ✓ Development of the 2-D Sediment Transport Model (AdH)
- ✓ Set-Up of the Chesapeake Bay Environmental Modeling Package (Bay impacts of sediment effects)
- ✓ Initial Brainstorming of Available Alternatives
- ✓ Modeling of Existing and projected conditions of No Action (just started)

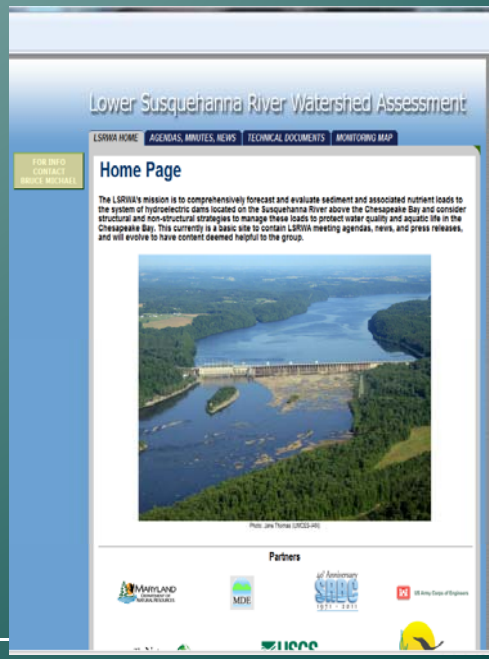
Stakeholder Outreach

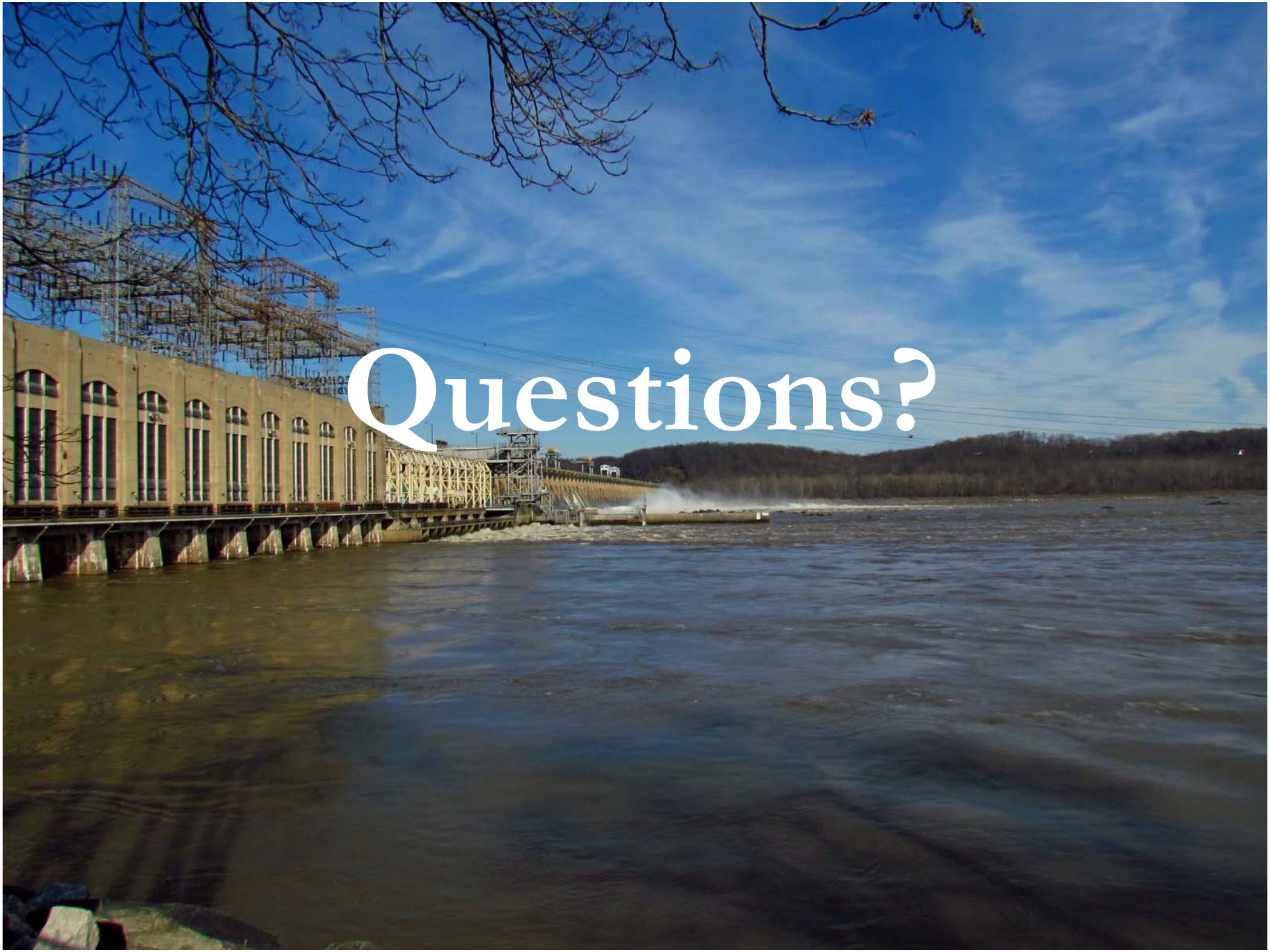
- ✓ Study Initiation Notice February 2012
- ✓ Agency Coordination Letters February 2012
- ✓ Facebook Page:

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

- ✓ LSRWA Website: http://bit.ly/LowerSusquehannaRiver
- ✓ Stakeholder Involvement Plan
- ✓ Email updates: to be added email

bmichael@dnr.state.md.us




Questions?