



The Conowingo Dam Settlement Litigation, Opposition and Relicensing

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November 9, 2020

CONOWINGO HYDROELECTRIC DAM



CONOWINGO DAM – LOOKING NORTH



TROPICAL STORM LEE - 2011



NASA SATELLITE IMAGE

NASA photograph from Terra satellite, September 13, 2011 – a few days after Tropical Storm Lee – showing a nutrient laden sediment plume extending about 100 miles to the mouth of the Potomac River.

Published in USGS August 2012
Hirsch Report (Flux of Nitrogen,
Phosphorus, and Suspended Sediment
from the Susquehanna River Basin to
Chesapeake Bay during Tropical Storm
Lee, Sept. 2011, as an Indicator of the
Effects of Reservoir Sedimentation on
Water Quality)



Conowingo Hydroelectric Power Plant Relicensing



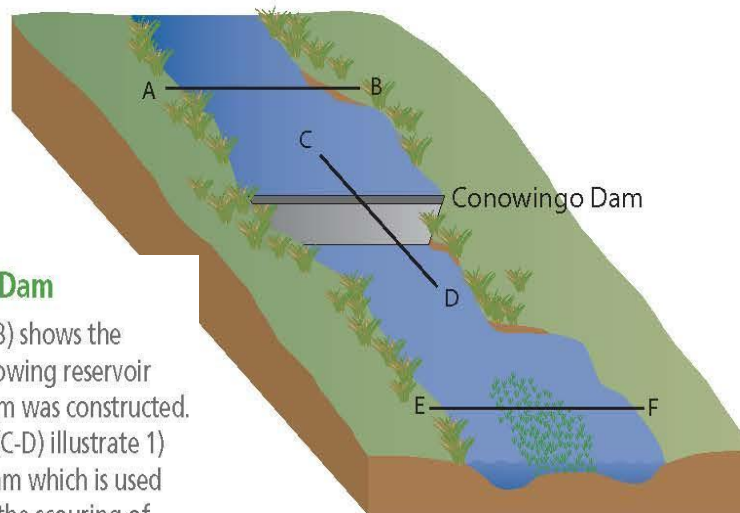
NASA photograph from the Terra satellite, September 13, 2011 (a few days after Tropical Storm Lee) showing sediment plume extending about 100 miles to the mouth of the Potomac River.

The reservoir above Conowingo Dam (in Lower Susquehanna River) has functioned as a stormwater management pond for over 80 years without ever being dredged or maintained. It is full and has lost trapping capacity (dynamic equilibrium).

The Maryland region of the Chesapeake Bay will not recover, and achievement of TMDL goals downstream will be impractical, if the Federal Energy Regulatory Commission (FERC) does not require Exelon to dredge the sediments that have accumulated in the Conowingo Pond.

Key processes of Conowingo Dam

The cross-section above the dam (A-B) shows the sedimentation underneath the shallowing reservoir that has been occurring since the dam was constructed. The cross-sections through the dam (C-D) illustrate 1) the hydraulic head created by the dam which is used to generate electrical power, and 2) the scouring of sediments and transport of sediments and phosphorus over the dam during high flows (175,000 to 300,000 $\text{ft}^3 \text{s}^{-1}$).

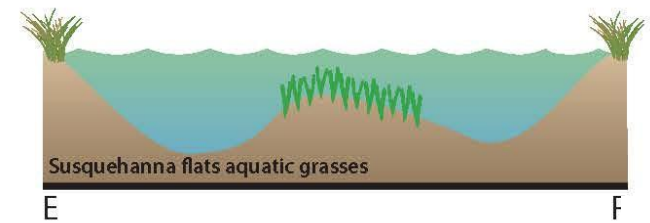
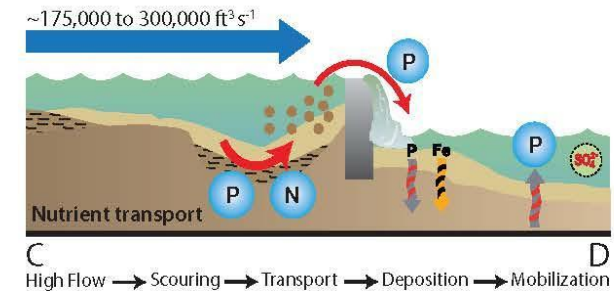
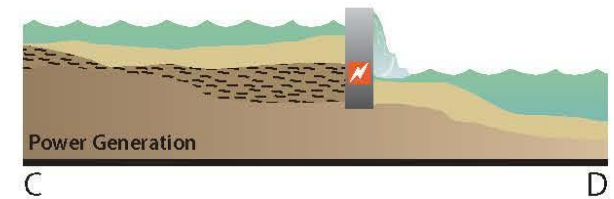
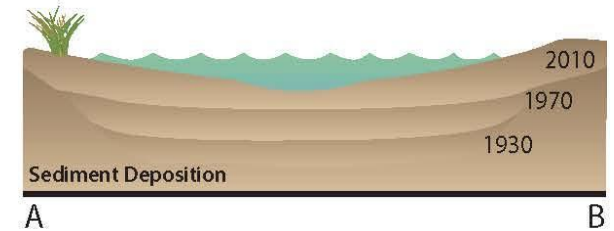


Conceptual depiction of Conowingo Dam reservoir and Susquehanna flats.

Cross-section A-B shows that annual sediment deposition since 1929 is making the dam shallower.

Cross-sections C-D comparisons show that high water flow ranging from 175,000 to 300,000 $\text{ft}^3 \text{s}^{-1}$ causes scouring, transport of sediments and associated nutrients P, N, deposition of phosphorus and iron, and mobilization of phosphorus in reaction with salt water.

Cross-section E-F shows the seagrass beds that grow on Susquehanna flats.



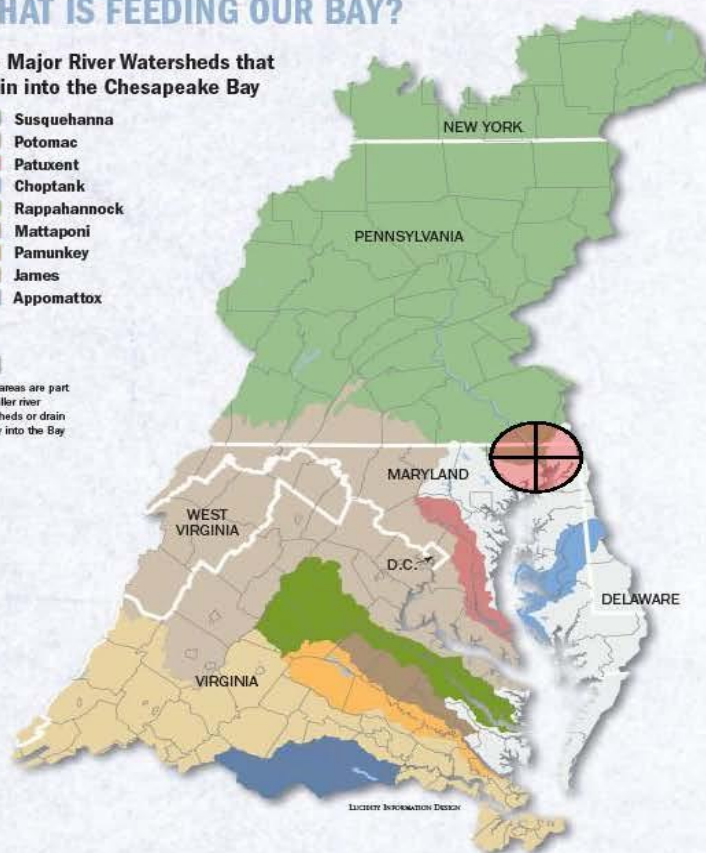
The Susquehanna's Influence on the Bay

WHAT IS FEEDING OUR BAY?

The Major River Watersheds that Drain into the Chesapeake Bay

- Susquehanna
- Potomac
- Patuxent
- Choptank
- Rappahannock
- Mattaponi
- Pamunkey
- James
- Appomattox

These areas are part of smaller river watersheds or drain directly into the Bay



The Susquehanna River Drainage Basin:

Is 27,510 square miles

- ✓ 6,275 sq. miles in New York (23%)
- ✓ 20,960 sq. miles in Pennsylvania (76%)
- ✓ 275 sq. miles in Maryland (1%)

Contains 49,000 miles of stream & creek banks

Supplies to the Chesapeake Bay:

47% of the freshwater

> 90% of the freshwater to the upper Bay

41% of the Nitrogen

25% of the Phosphorus

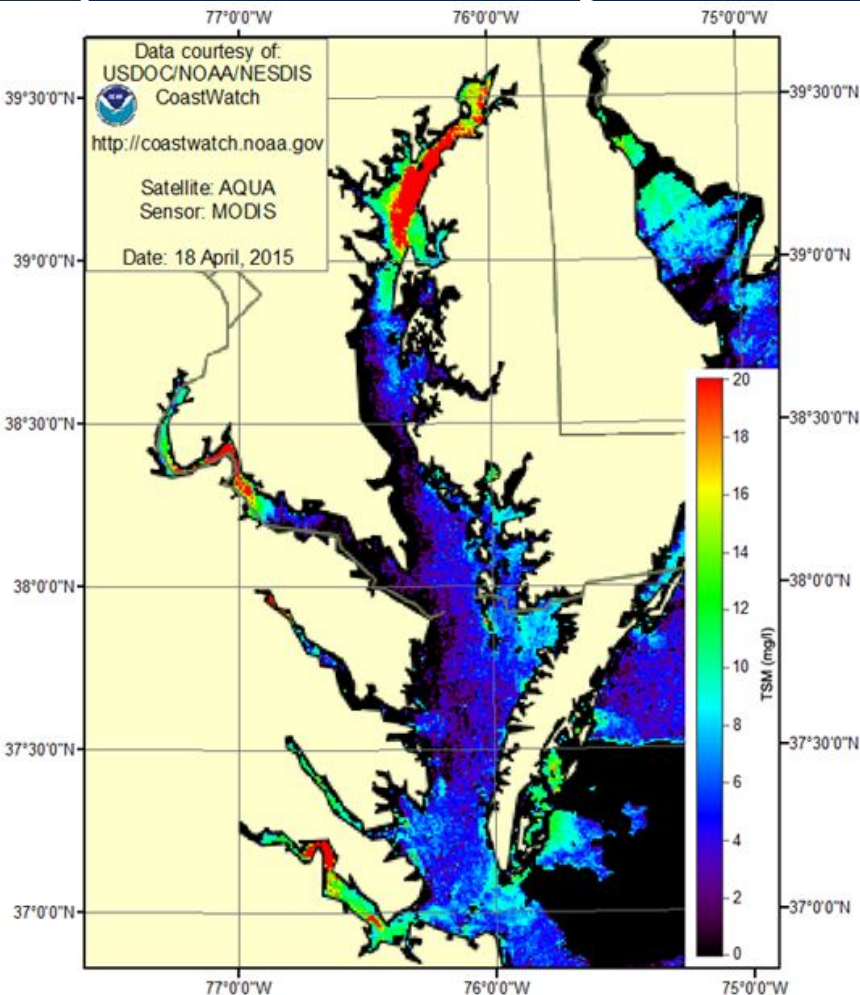
27% of the sediment

Given its scale, any actions related to the Bay **MUST** include the Susquehanna River and its outflow at the Conowingo Dam

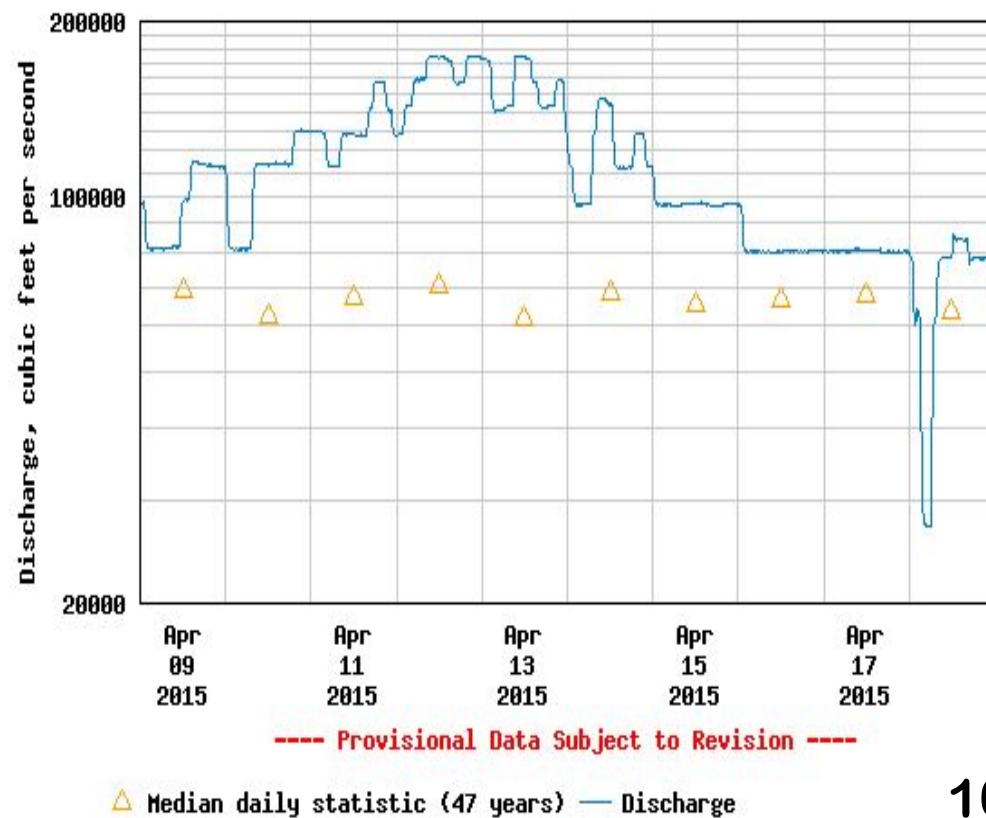
CONOWINGO DAM 2015 SPRING MELT



CONOWINGO DAM 2015 SPRING MELT



USGS 01578310 SUSQUEHANNA RIVER AT CONOWINGO, MD



MAJOR STORMS

Hurricane Agnes (1972)

- 31 mil tons S
 - 20 mil tons S scour

Tropical Storm Lee (Sept. 2011)

- 115,910 tons of N
 - nine (9) month supply
- 14,070 tons P
 - over one (1) year supply
- 19 mil tons S
 - 4 mil tons S scour (at least)



View of the Conowingo Dam on the Susquehanna River in the aftermath of Tropical Storm Lee. Photo taken at 4:30 p.m., September 12, 2011. Photograph by Wendy McPherson, courtesy of U.S. Geological Survey.

History: Bay TMDL/WIPs

- Total Maximum Daily Load (TMDL) (aka pollution diet)
 - Executive Order No. 13508 (May 12, 2009)
 - Recognized Chesapeake Bay as national treasure and called on federal government to lead a renewed effort to restore and protect
 - *Chesapeake Bay Foundation v. U.S. EPA*
 - May 2010 –settlement requiring establishment of Chesapeake Bay TMDL by EPA (December 2010) – the largest and most complex in the nation
 - Focused on natural/physical environment; not in harmony with human environment
 - Chesapeake Bay Foundation v. U.S. EPA* redux (2020) re PA
- Watershed Implementation Plans (WIPs)
 - TMDL requires Bay states to each adopt a WIP identifying programs, policies and practices to meet pollution reduction goals – now at Phase III
 - Conowingo WIP being drafted (per mid-point recalibration)

TOTAL MAXIMUM DAILY LOAD – CONOWINGO DAM MISCALCULATIONS

- EPA's 2010 Bay TMDL is flawed for failing to adequately account for the single largest source of pollution (> 50%) to the Bay – the Susquehanna River – through the Conowingo Dam
 - Bay TMDL Appendix T:
 - EPA assumption that Conowingo Reservoir trapping capacity (55%) will continue through 2025
 - “This represents a **business-as-usual** scenario in which the future diminished trapping capacity behind the Conowingo Dam is not considered...”

IMPACT ON SHIPPING CHANNELS TO PORT OF BALTIMORE

Dredging the reservoir above
Conowingo Dam vs. dredging
below the Dam?



THANK YOU



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