

Conowingo Hydroelectric Station

Kathleen Barrón

Senior Vice President, Government and Regulatory Affairs and Public Policy

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About Exelon



Generation

Nation's largest producer of clean energy
32,000 MW of owned capacity
Generates enough electricity to power 20 million homes and businesses

Competitive Energy Sales

Retail and wholesale sales through Constellation business unit
~2 million residential, public sector and business customers
Two-thirds of Fortune 100 companies

Transmission and Delivery

Six utilities delivering electricity and natural gas to more than 10 million customers: BGE (MD), ComEd (IL), Delmarva (DE and MD), PECO (PA), Pepco (D.C. and MD), Atlantic City Electric (NJ)

Committed to powering a cleaner and brighter future for our customers and communities

Exelon in Maryland



Generation

Calvert Cliffs Nuclear Plant
Criterion Wind Project
Conowingo Dam

2,326 MW of carbon-free
energy

2.2 million+ homes

Competitive Energy Sales

Retail sales, as well as
successful Home
Performance with ENERGY
STAR program

Completed 342 energy
efficiency projects, saving
customers over \$16M
annually in energy costs

Transmission and Delivery

MD's largest natural gas and
electric utility

Maryland Customers:

BGE Electric: 1.25 million

BGE Natural Gas: 650,000

Delmarva: 204,000

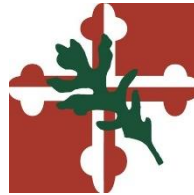
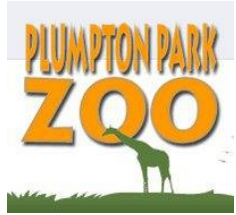
Pepco: 567,000

7,500 Maryland residents employed by Exelon

2018 Philanthropy & Stewardship in Maryland



Tome Visitor
Center &
Turtle Habitat



Rocky Gap
State Park



Calvert Marine
MUSEUM

- More than **\$10 million** in corporate gifts in MD
- 2,700 Maryland employees pledged **\$1.7 million** in Employee Giving campaign
- **65,000+ hours** volunteered
- **\$235,900** raised in “Dollars for Doers” volunteer rewards to 550 unique MD nonprofits



Conowingo Generating Station Overview

For nearly 90 years, the Conowingo Dam has been a source of clean, reliable energy for thousands of residents and businesses.

- Location: **Lower Susquehanna River, Darlington, MD**
- Began operation: **1928**
- Construction cost: **\$59 million (1928 \$s)**
- **4,468 feet long** and **104 feet tall**
- **11 generators**
- Current generating capacity: **572 megawatts**
- 2018 output: **2.59 million megawatt hours** (*enough to power more than 50,000 typical households for an entire year.*)
- Generating hydraulic capacity is **86,000 cfs**; flows greater than 86,000 cfs are managed by opening crest gates
- Last relicensing: **1980**
- Current license expired: **September 2014**
 - Operating under annual license
- New 46-year license application filed: **August 2012**



History – Plant Generation Capacity



Units 1-7

- 7 units commissioned March 1, 1928
- 36 MW each
- Plant capacity: 252 MW (1928)

Additional engineering improvements

- Implemented in early 2000s to increase plant capacity to current 572 MW

Units 8-11

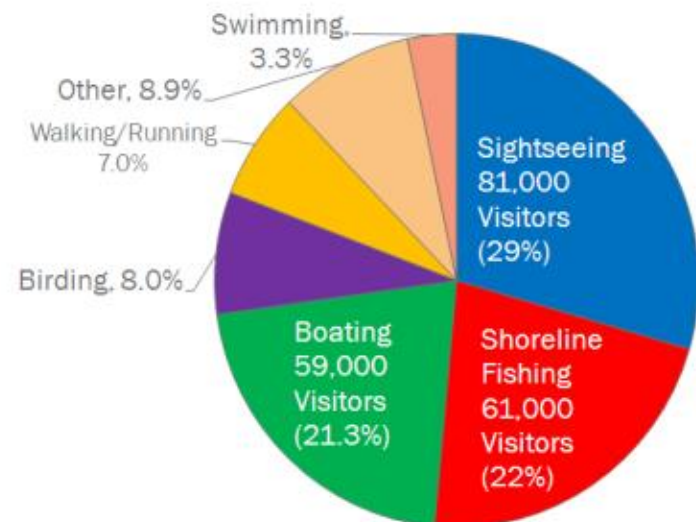
- 4 units commissioned in 1965
- 65 MW each
- Plant capacity: 512 MW (1965)



An Economic Engine

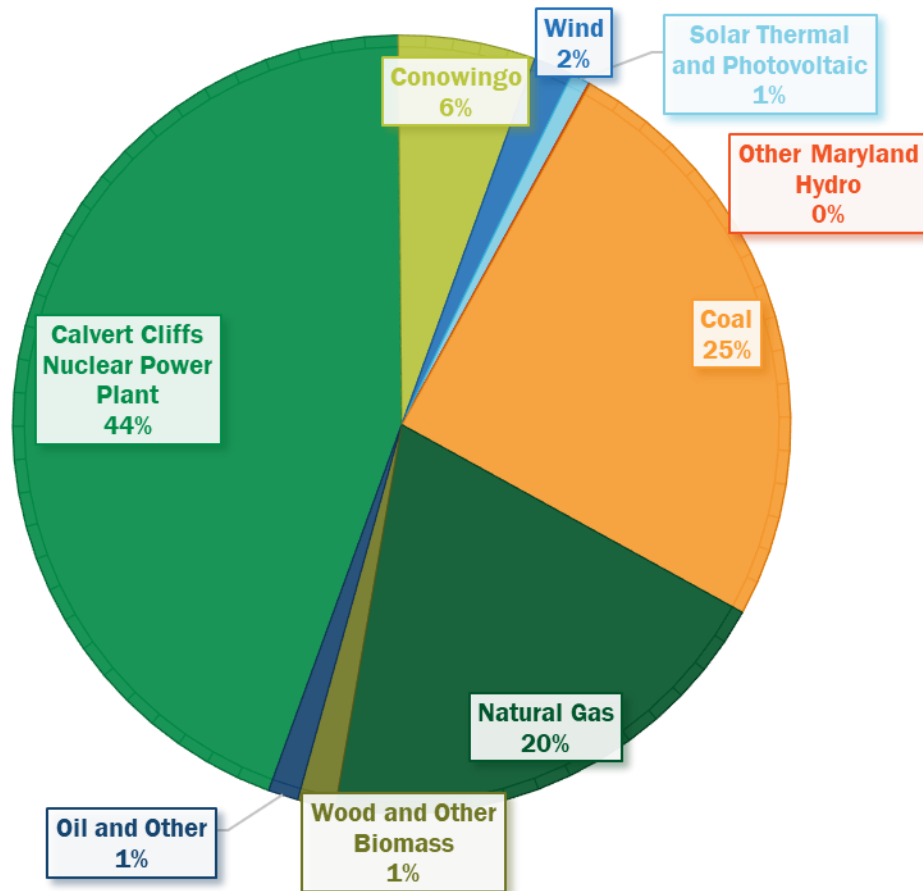
Conowingo delivers economic benefits to Maryland and its surrounding communities

- Directly and indirectly contributes 265 full-time equivalent jobs
- Pays \$10 million in state and local taxes annually, including \$3.5 million in property taxes
- Helps drive the tourism economy in Cecil and Harford Counties by attracting 250,000 recreational visitors a year, supporting the \$200 million tourism industry in Cecil and Harford counties

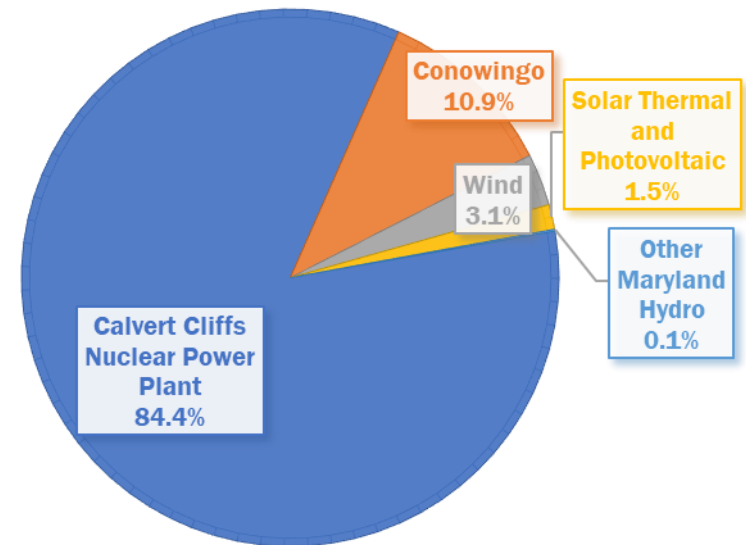


Source : Conowingo Hydroelectric Project Recreation Management Plan, August 2012 figure 6.4-1.

Maryland Electric Power Generation, 2017

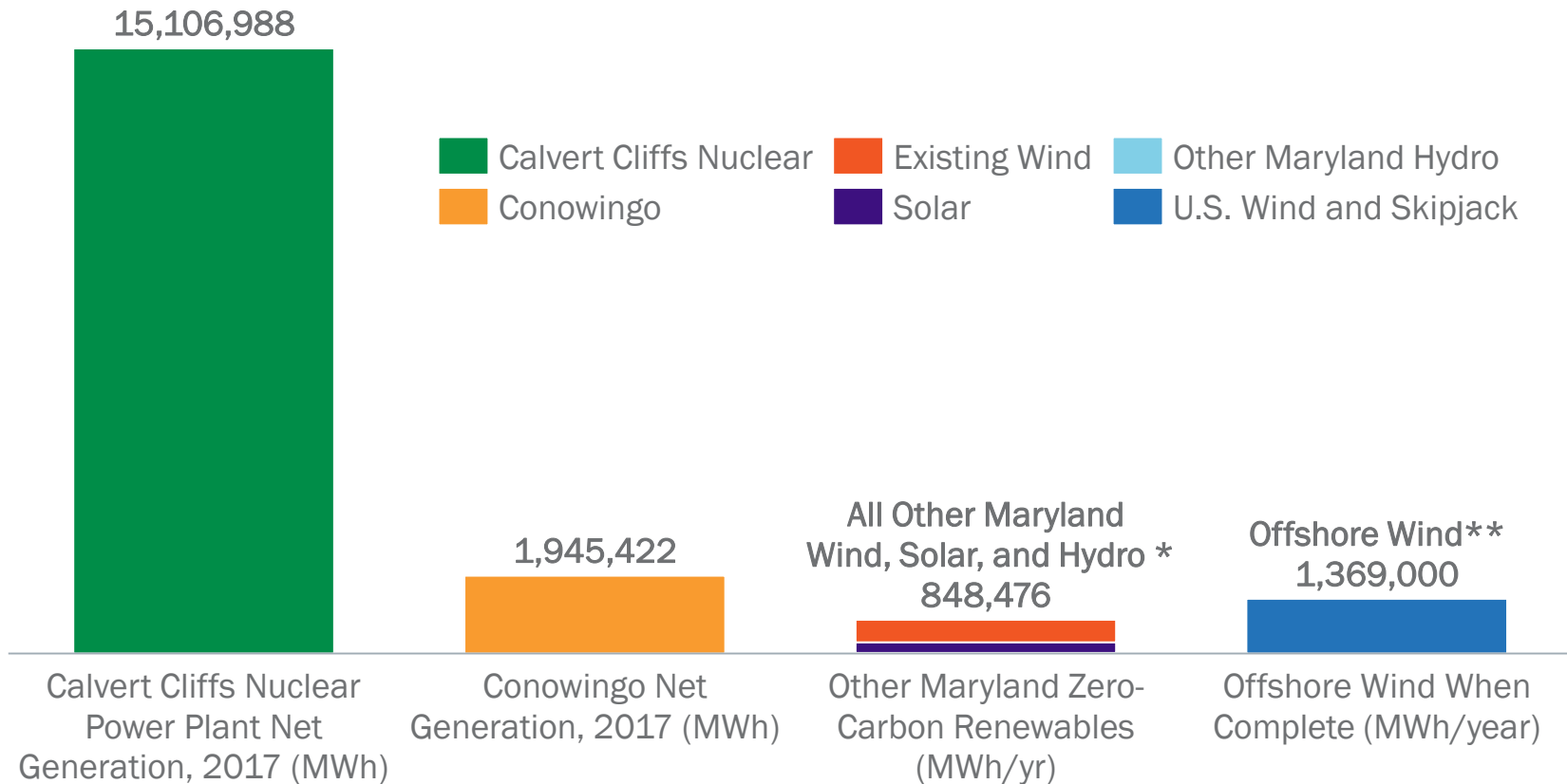


MARYLAND ZERO-CARBON GENERATION



Conowingo provides 6 percent of the power generated in Maryland and 11% of the zero-carbon power. Exelon's Calvert Cliffs and Conowingo generate 95% of Maryland's zero-carbon power

Emission Abatement Options in Maryland



Conowingo Dam generates 2.3 times as much electricity as all the wind, solar, and other hydroelectric power in Maryland

* Renewable Generation from EIA State Historical Tables for 2017 (Sept. 2018 Release)

** U.S. Wind and Skipjack, approved by PSC May 2017, 43% capacity factor at OREC caps, to come into operation in 2020 and 2022 at build cost in excess of \$2 billion. <https://www.psc.state.md.us/wp-content/uploads/PSC-Awards-ORECs-to-US-Wind-Skipjack.pdf>

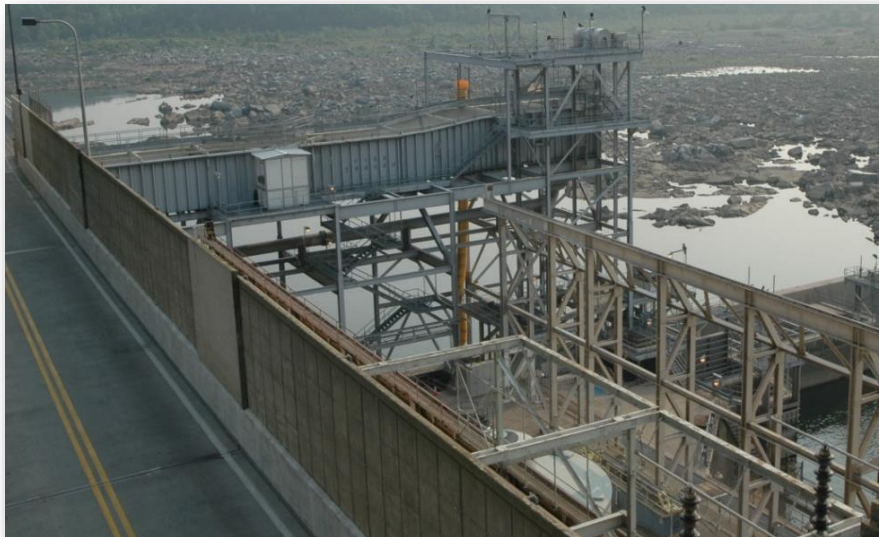
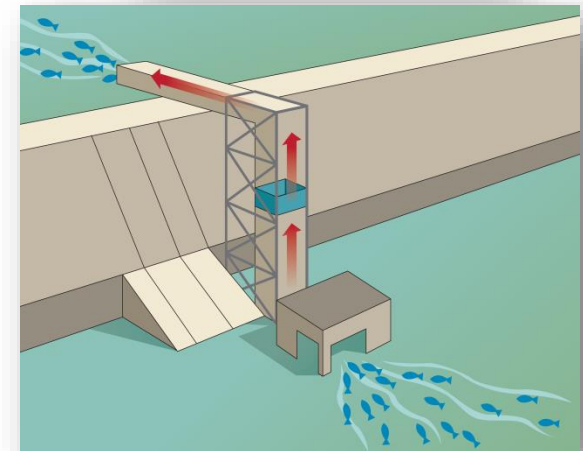
Conowingo Relicensing Benefits

- DOI agreement providing for improved fish passage, including trapping and trucking American shad above York Haven Dam
- National Marines Fisheries Service agreement for the protection of Atlantic and Short Nose Sturgeon if located in the Susquehanna River
- PA DEP & DOI agreement to transport American eels to MD and PA tributaries
- Adoption of bald and golden eagle mgmt plans (DOI consult/College of W&M studies)
- Adoption of habitat protections for map turtles (MDE consult and Towson University studies)
- Adoption of Shoreline Management Plan (in consult with Harford, Cecil, York and Lancaster Counties)
- Other benefits: improved recreational opportunities, enhanced flow regime and additional habitat studies and monitoring
- **\$300+ million in benefits to aquatic and wildlife habitat in the Susquehanna region**



Transporting Aquatic Life

- Conowingo Dam is unique in that it operates two “Fish Lifts,” specialized elevators that Exelon uses to transport American Shad and other fish species upstream
- **West Fish Lift:** Constructed in 1972 (\$2 million)
- **East Fish Lift:** Constructed in 1991 (\$12.5 million)
- Generally, the Conowingo fish lifts pass between 850K – 2.8 million fish each year - comprised of 25 to 45 various species of fish

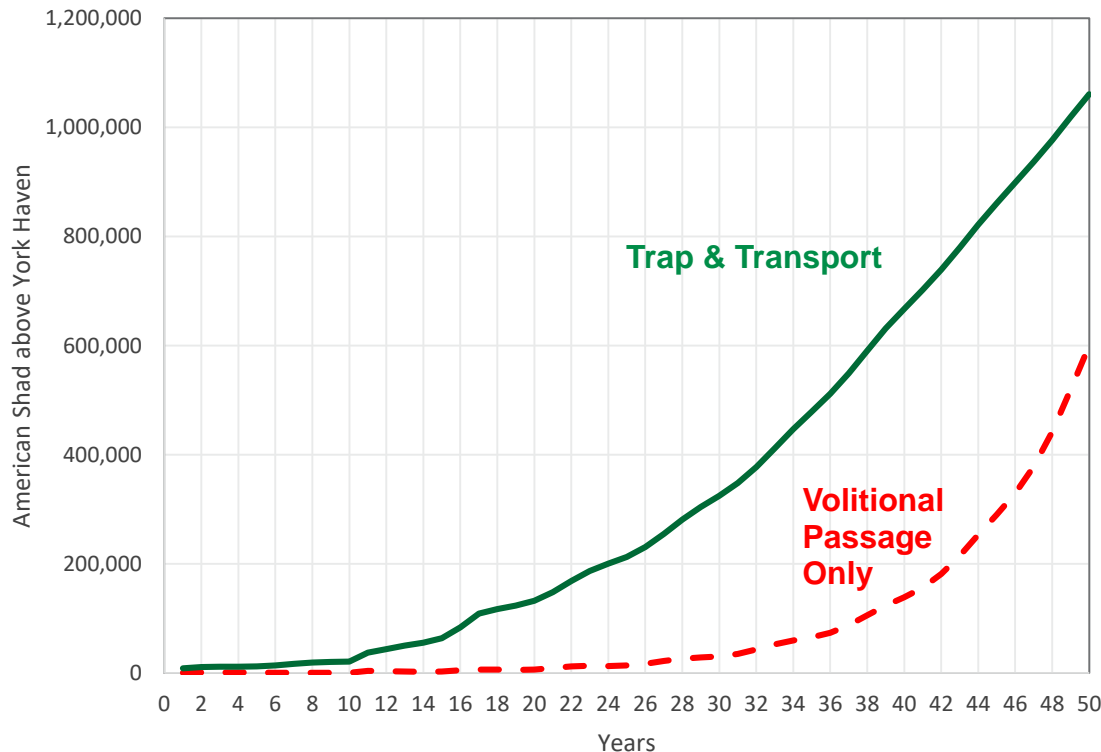


From 1997 through 2018, the Conowingo East Fish Lift has passed 1.2 million American Shad upstream into Conowingo Pond

Exelon/Department of Interior Relicensing Agreement

- Population modeling undertaken by Interior and Exelon demonstrates that trap and transport of American shad provides the best opportunity to ensure population growth

Projected American Shad Population
above York Haven Dam



Fish Passage Enhancements

- \$37 million in improvements:
 - Increase hopper capacity
 - Improve attraction flows
 - Accelerate lift cycles
 - Create zones of passage for migrating fish
- Commits to transporting up to 100,000 American shad and river herring annually to above York Haven Dam

Bay Debris Management

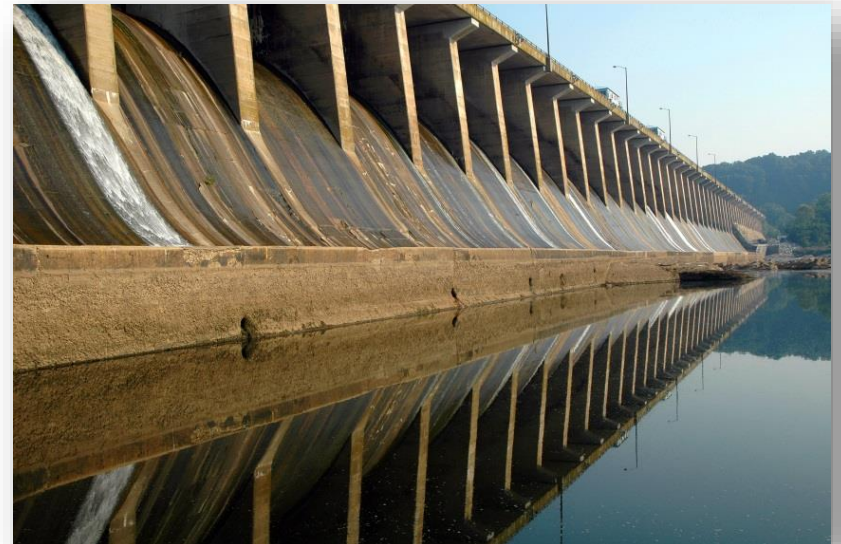
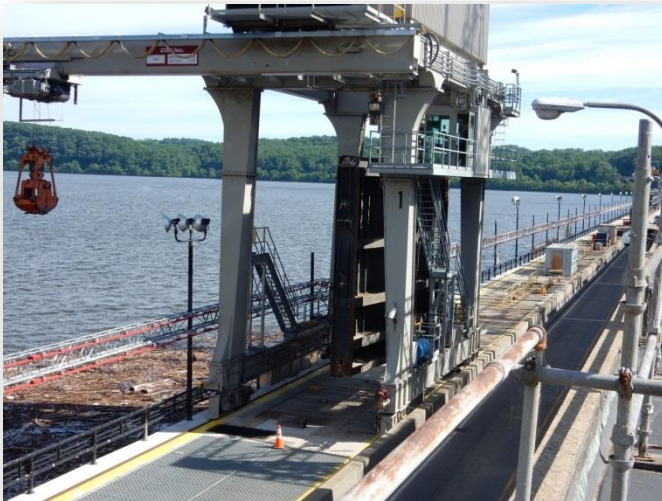
- Debris travels into the Bay from points throughout the 27,500 mile Susquehanna watershed in NY, PA and MD
- 600 tons of recovered debris removed, separated and recycled annually by Exelon, normally
- 4,000+ tons of debris removed in 2018
- We deploy crews to operate overhead cranes and grapple devices to clear debris from the river as safely and efficiently as possible
- **When safe**, we will also launch debris skimmer boats to assist with cleanup
- Each year, Exelon sponsors two events--the Lower Susquehanna Heritage River Sweep and Conowingo Pond clean-up day--where we remove more than 100 tons of debris and refuse from the river each year



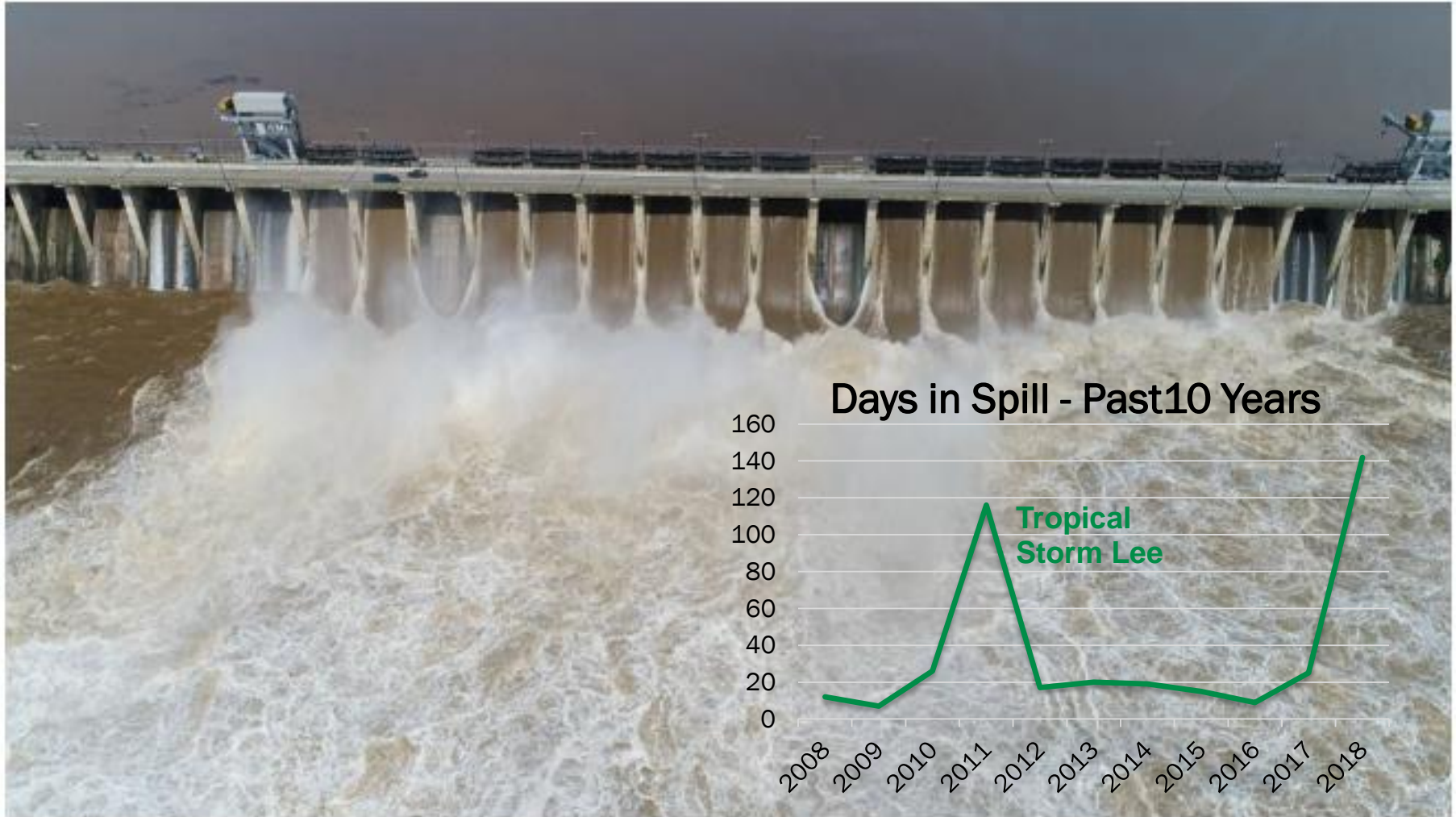
Exelon Generation contributed more than \$150,000 to organizations and groups in 2018 to help clean trash and debris from the Susquehanna River

Conowingo Crest Gates

- 50 crest gates used to control pond elevation, after full operation of the 11 generating units
- Run of the River – must pass river flows
- Each crest gate passes 16,000 cfs
- 3 cranes used to lift crest gates
- Integrated Communications with neighboring counties (Harford Co & Cecil Co), Gov Agencies, and Emergency Services



2018: Historic Flooding



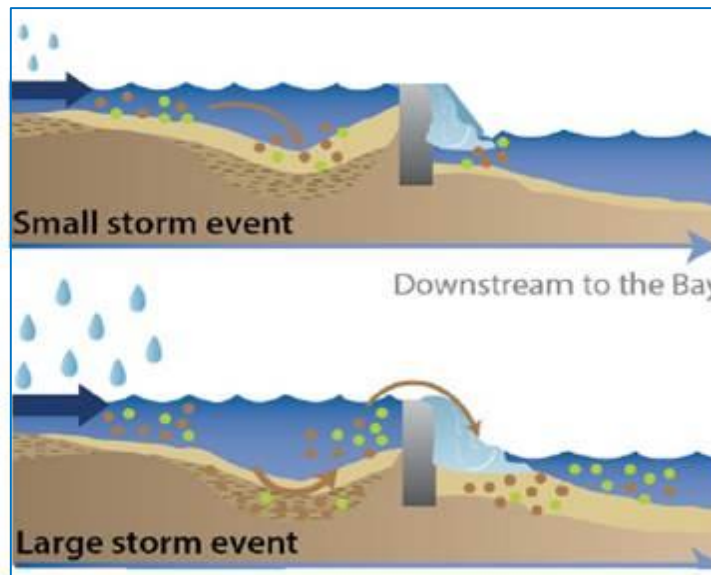
MDE 401 Certification Debris Obligation

- Requires Exelon to “remove **all** visible trash and debris” regardless of where it originates in the basin
- Simply impossible to remove all debris
- Debris that collects along western side of dam does not pass through spill gates and can be removed
- Debris moving rapidly on eastern side of dam during spill conditions moves through spill gates
- Debris is not caused by the Dam
- The Clean Water Act section 401 applies to the activities of the party



Conowingo Continues to Provide Benefits to the Bay

- Despite dynamic equilibrium, Conowingo Dam continues to provide benefits with regard to nutrients (phosphorus/nitrogen)
- For the vast majority of the time, Conowingo continues to trap nutrients, preventing them from entering the Bay
- As the nutrients are trapped over time, they become more difficult to re-suspend during high-flow events and thus less likely to enter the Bay
- The bio-reactivity of nutrients degrade over time as these nutrients are stored in Conowingo Pond
- Dredging the Dam may increase sediment at an environmental cost 10 times greater than any potential benefit to the Bay*



- Almost all of the nutrients are from upstream sources
- Much of the nutrients are biologically available to algae when they enter tidal waters
- Some of the nutrients are scoured from the bottom sediments behind the dam
- Much of these scoured nutrients are not biologically available to algae when they enter tidal waters

*Lower Susquehanna River Watershed Assessment

MDE 401 Certification Nutrient Obligation

- 401 Certification requires the dam to “annually reduce” the amount of nitrogen in the river water flowing through the dam by 6,000,000 pounds, and the amount of phosphorus by 260,000 pounds
- Dam operations do not add these pollutants to the water and in fact the Dam has benefitted the Bay by trapping them for years
- There is no basis for these obligations in federal or state law. Again, the party that adds pollutants to the water is responsible for reducing pollutants
- The reduction of a benefit does not equal a harm, and it cannot justify the imposition of obligations on Exelon for pollutants introduced into the Susquehanna River by other parties

The Problem

- Upstream land runoff and erosion sends nutrients into the river, impacting the Bay
- The Dam, which benefitted the Bay by trapping materials for 90+ years, has reduced capacity to do so now

The Solution

- Address with a regional approach focused on the source of the pollution
- Implement regional best management practices to reduce nutrients and prevent erosion

In Conclusion...

