Ongoing Conowingo Dam / Lower Susquehanna River Studies

Modeling Quarterly Review Meeting
January 14, 2015

MARYLAND
Smart, Green & Growing

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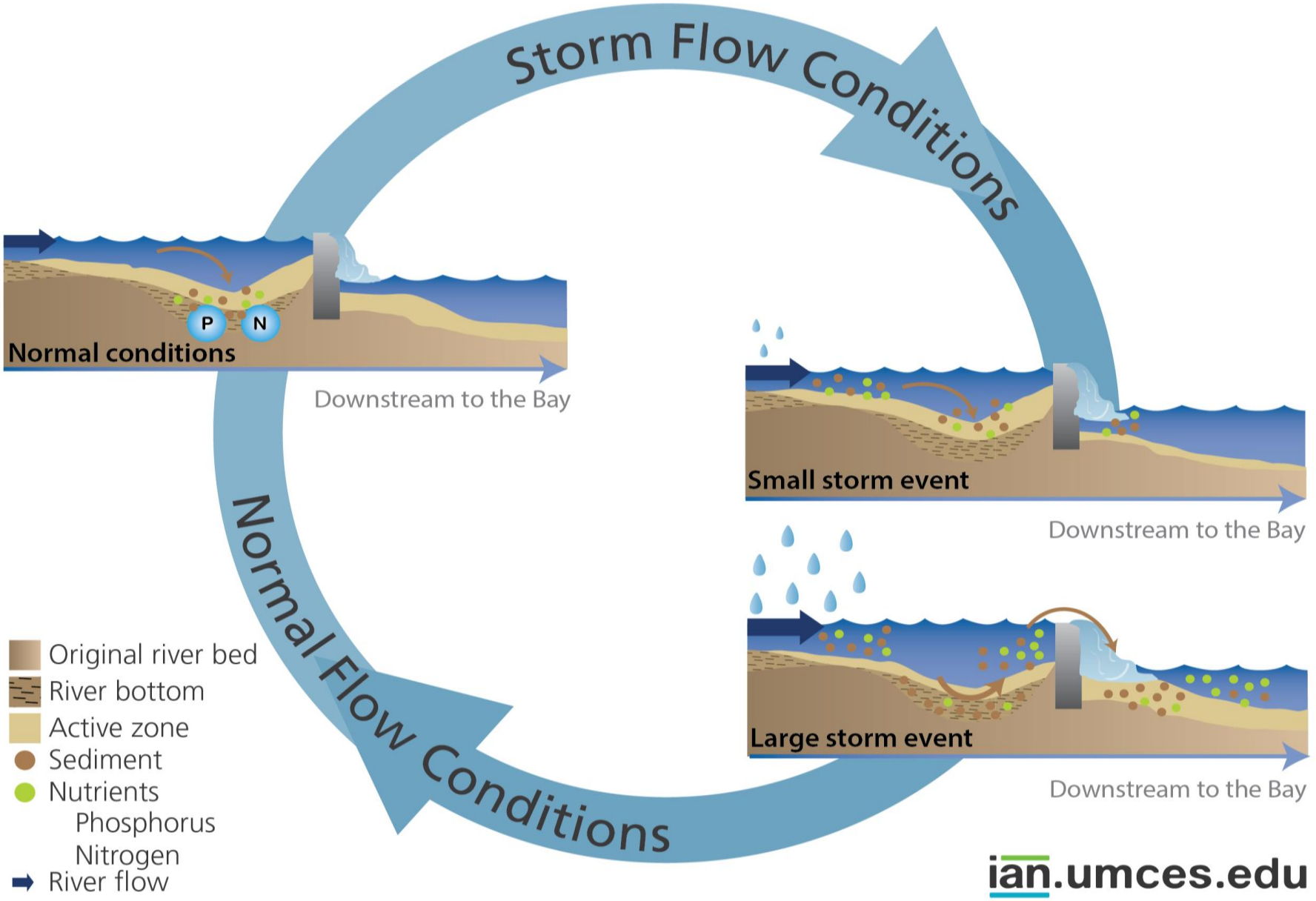
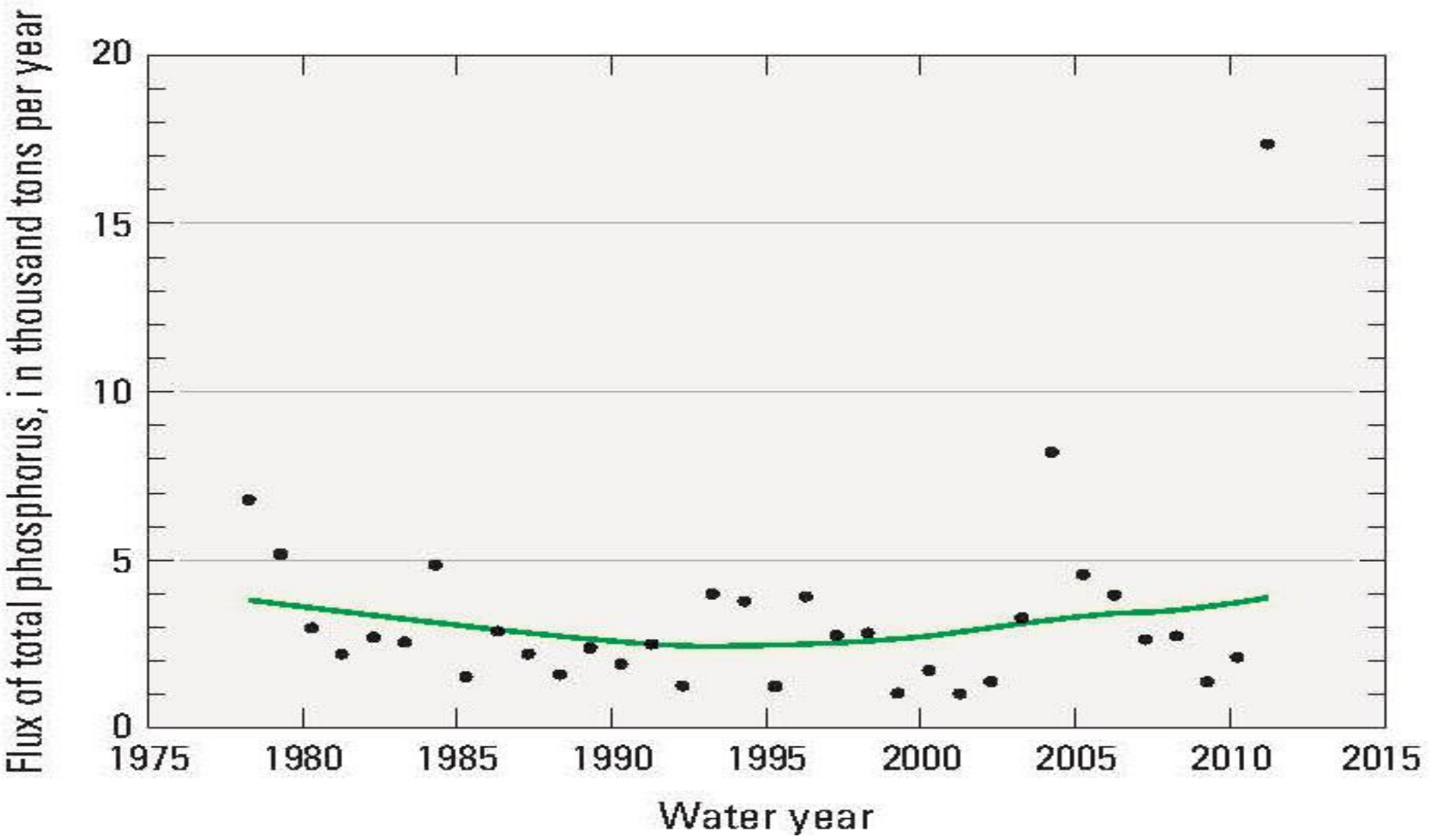
Draft Lower Susquehanna River Watershed Assessment Study - 4 Major Findings

- **Conditions in the Lower Susquehanna reservoir system are different than previously understood**
- **The loss of long-term sediment trapping capacity is causing impacts to the health of the Bay ecosystem**
- **Sources upstream of Conowingo Dam deliver more sediment and nutrients, and therefore, have more impact on the Bay ecosystem, than do the scoured sediment and associated nutrients from behind Conowingo Dam**
- **Large-scale dredging, along with bypassing and operational changes, do not provide sufficient benefits to offset water quality impacts from the loss of long-term sediment trapping capacity.**

Finding 1: Conditions are Different Than Previously Understood



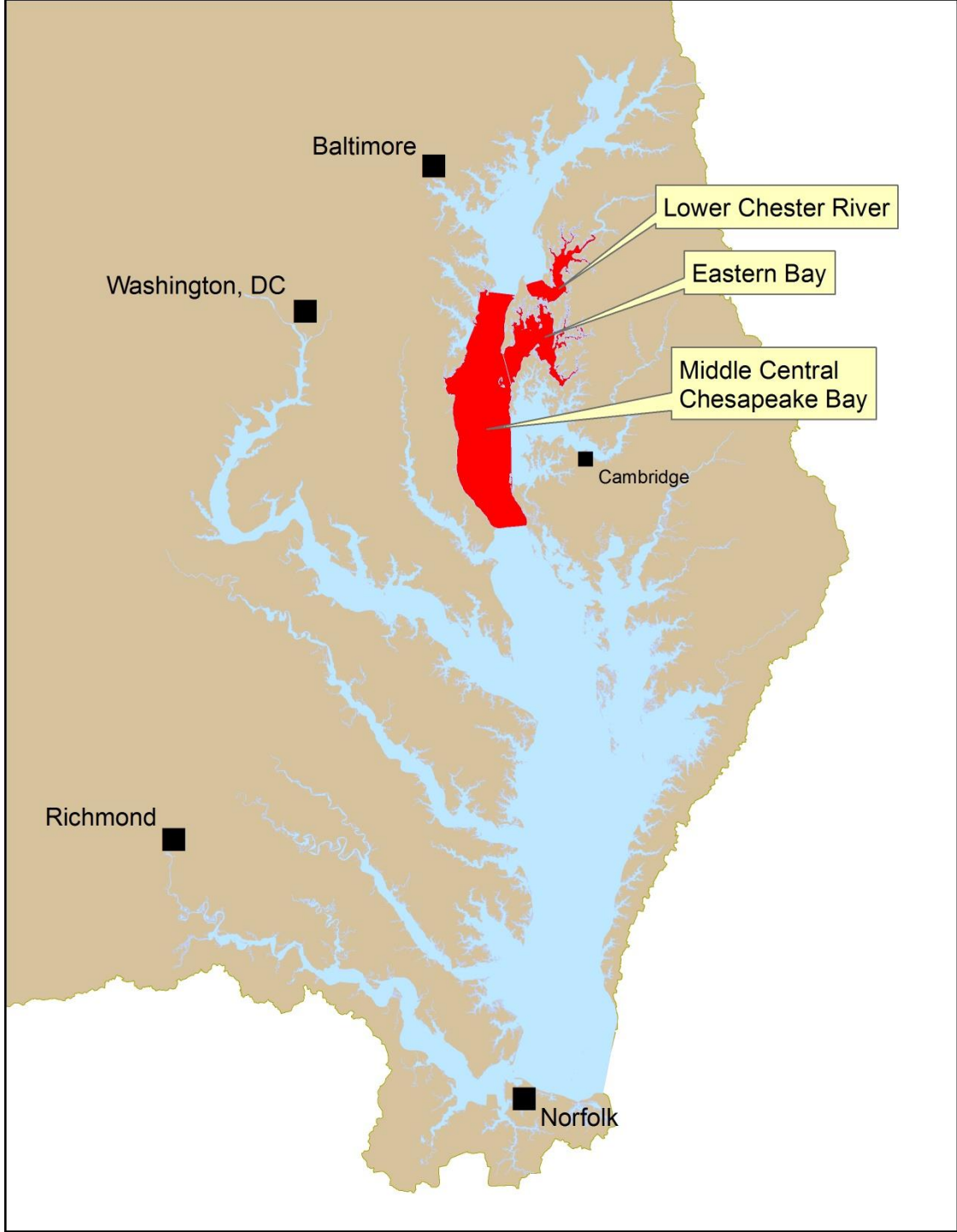
Finding 2: Loss of Long-Term Trapping Impacts the Bay



Graphic courtesy of USGS

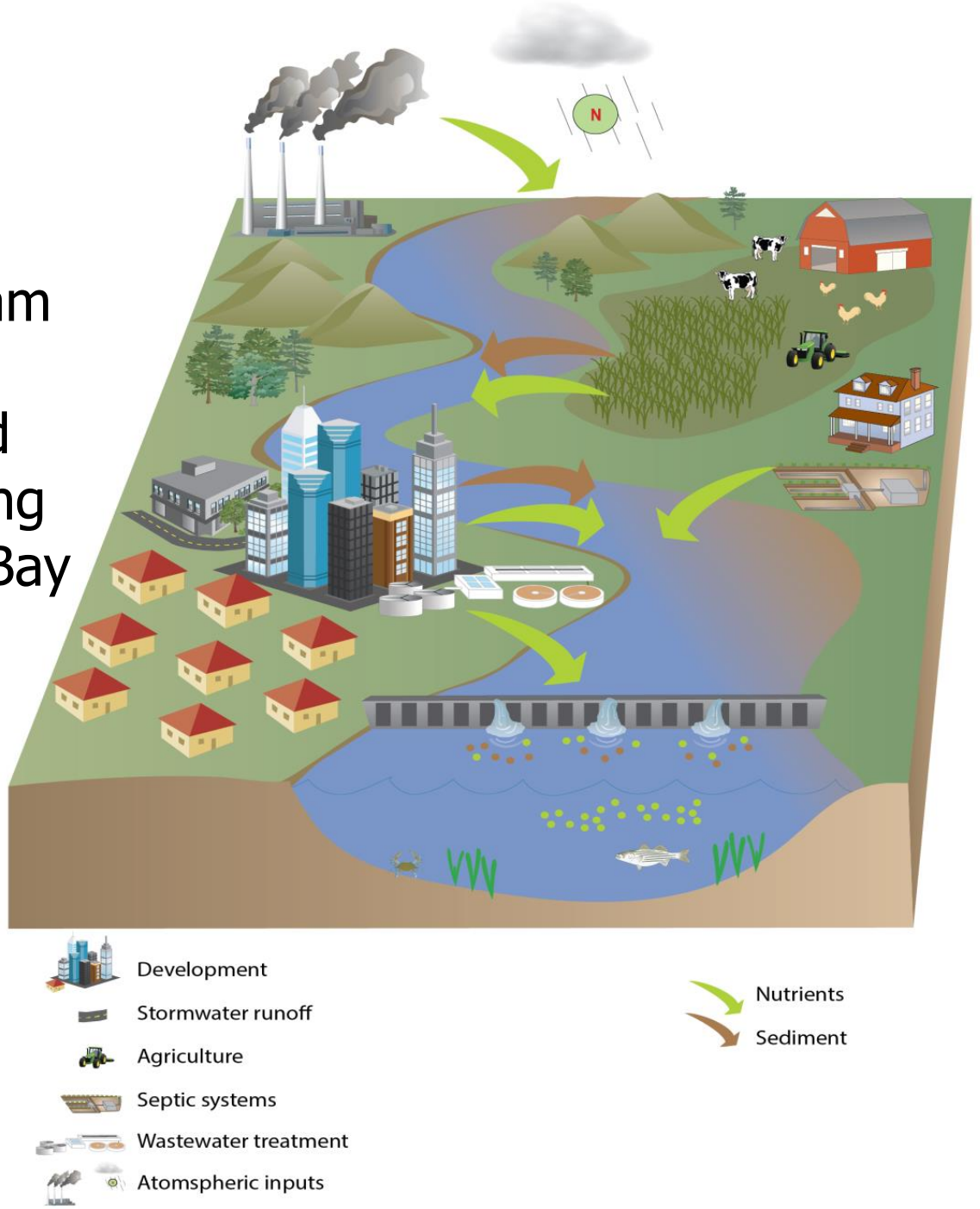
Finding 2 Continued:

Chesapeake Bay Water Quality Under Watershed Implementation Plans Fully Achieved: Dams in Dynamic Equilibrium



Finding 3:

Sources Upstream Deliver More Sediments and Nutrients Causing More Impact to Bay



Graphic courtesy of UMCES

Finding 4: Dredging, Bypassing, and Dam Operational Changes, By Itself, Does Not Provide Sufficient Benefits to Offset Impacts From the Loss of Long-Term Trapping Capacity

- **Dredging = Minimum, Short Lived Water Quality Benefits**
- **Cost: $15-270 Million Every Year**
- **Back to Mid-1990's = $496 million to $2.8 billion**
- **Only 'Keeping Up' With Inflowing Sediment**
- **Reducing Nutrients at Their Source More Effective**

Draft LSRWA Recommendations

- **Before 2017, quantify the full impact on Bay aquatic resources and water quality from changed conditions in the lower Susquehanna River and reservoir system.**

- **EPA and State partners should integrate findings from the LSRWA into their ongoing analyses and development of the seven watershed jurisdictions' Phase III WIPs as part of Chesapeake Bay TMDL 2017 mid-point assessment.**

- **Develop and implement management options that offset impacts to the upper Chesapeake Bay ecosystem from increased nutrient and sediment loads.**

- **Commit to long-term monitoring of sediment and nutrient processes in the lower Susquehanna River system and upper Chesapeake Bay to promote adaptive management.**

Contingency for Meeting Maryland's Water Quality Certification

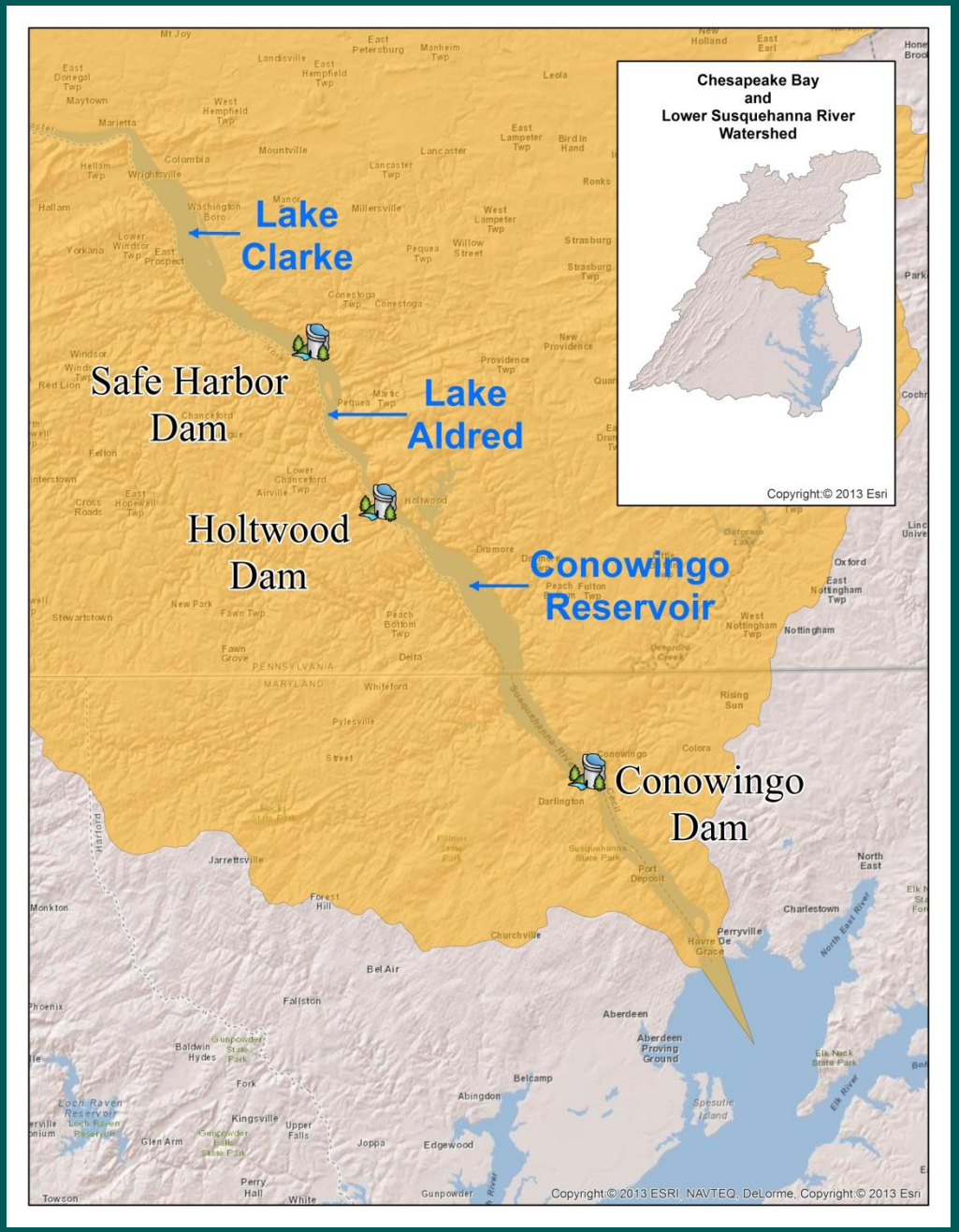
- Exelon, with MD State agencies, USGS, CBP, and consultants developed Lower Susquehanna River Integrated Sediment and Nutrient Monitoring Program
- November 2014 – December 2016
- Results to be used to inform the Chesapeake Bay 2017 Midpoint Assessment

Lower Susquehanna Study Area

Graphic courtesy of SRBC

Susquehanna originates in NY, empties into Bay at Havre de Grace, a distance of 444 miles

Conowingo Dam Built in 1928

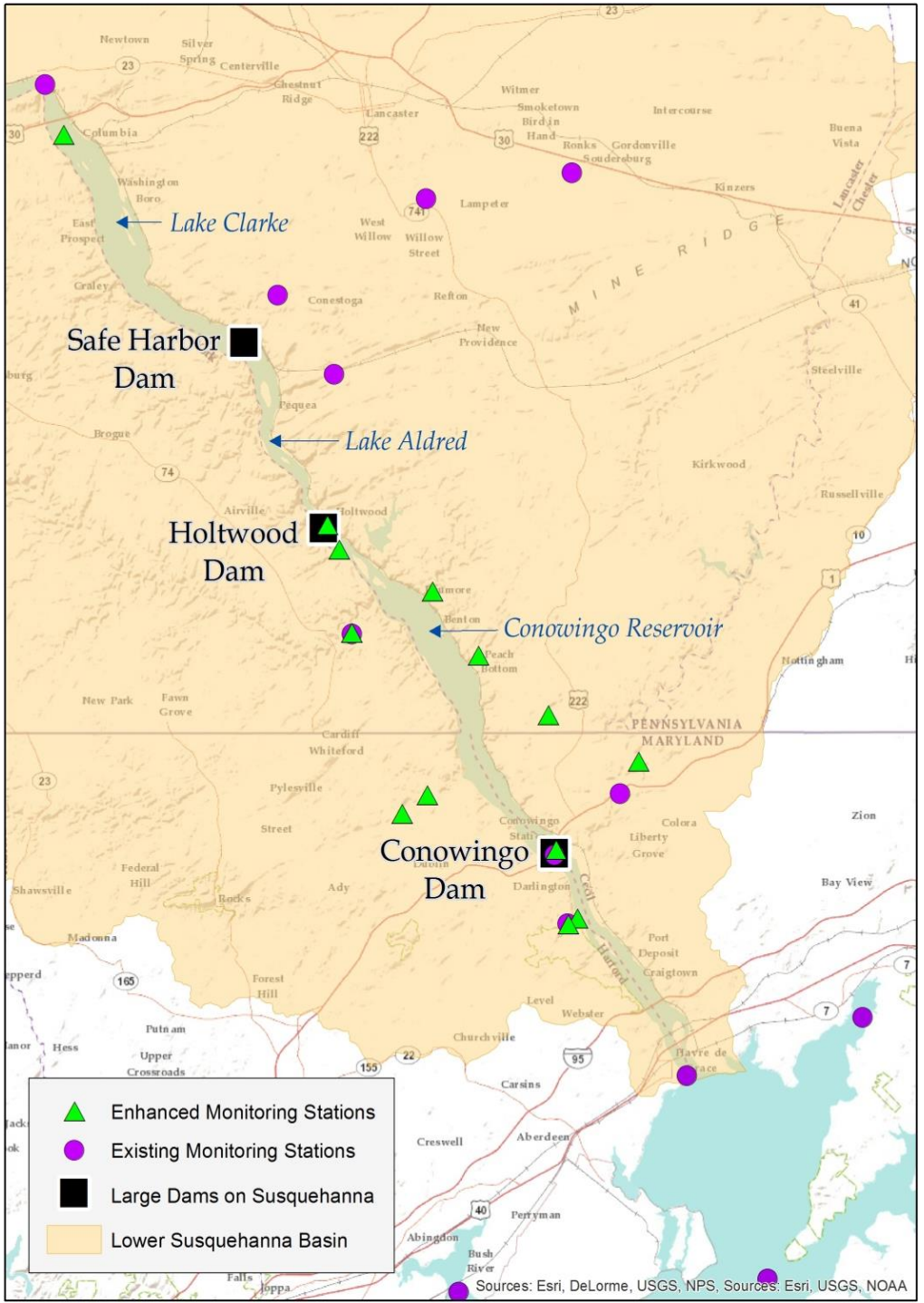


Project Purpose

- Gain a better understanding of the downstream impacts of Conowingo Dam (and the other upstream Dams) of reaching “dynamic equilibrium” on Bay water quality.

Enhanced Monitoring and Modeling

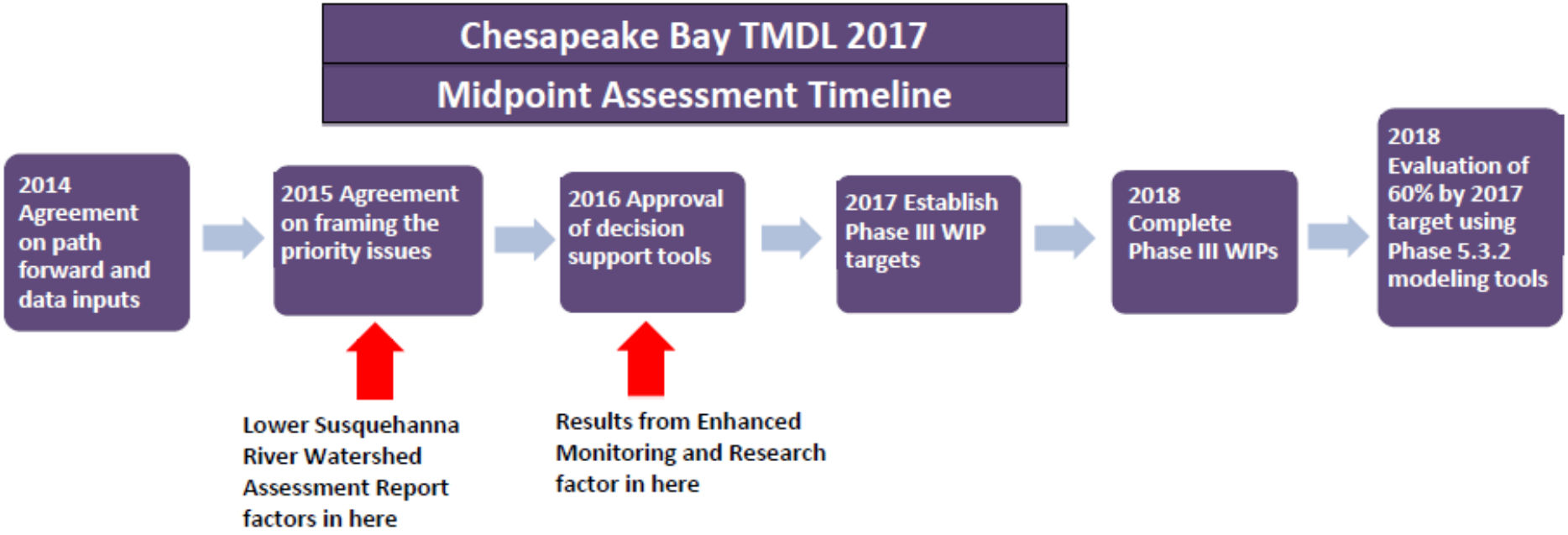
- Short-Term
- Long-Term

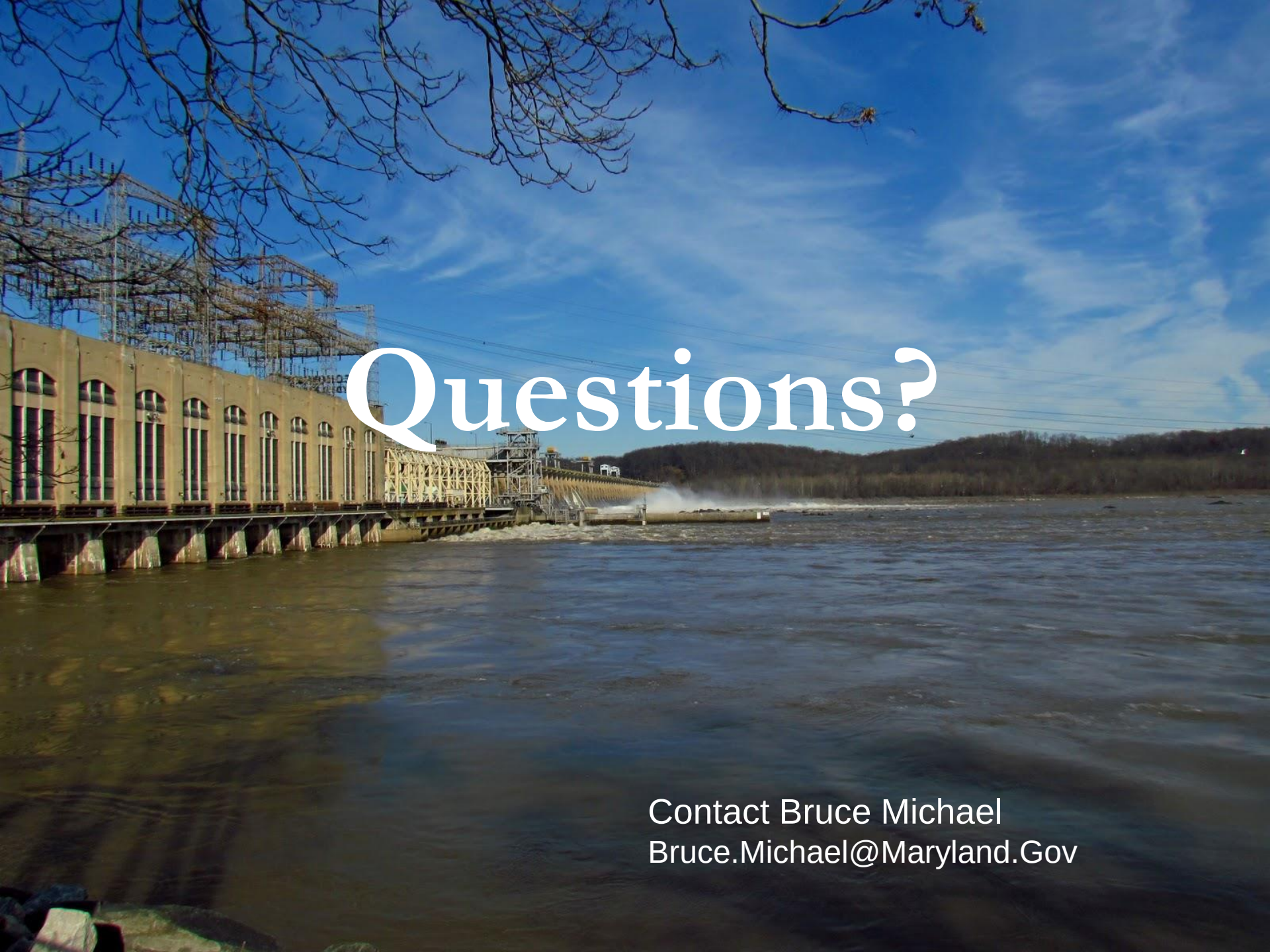


General Approach

- Measure flow and collect water samples during 6 high flow events and measure continuous turbidity at Marietta, Holdwood and Conowingo Dam to determine SSC, PSD and nutrients
- Collect water samples at 7 major tributaries flowing into Conowingo Dam and below
- Conduct suspended particle characterization of particles entering and leaving Conowingo Pond
- Collect sediment cores throughout Conowingo Pond
- Conduct various estuarine physics and biogeochemical experiments and modeling to understand the fate and effects of particles on Bay water quality

Integrate LSRWA Findings into Bay Total Maximum Daily Load Midpoint Assessment





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Satellite Photo of Tropical Storm Lee

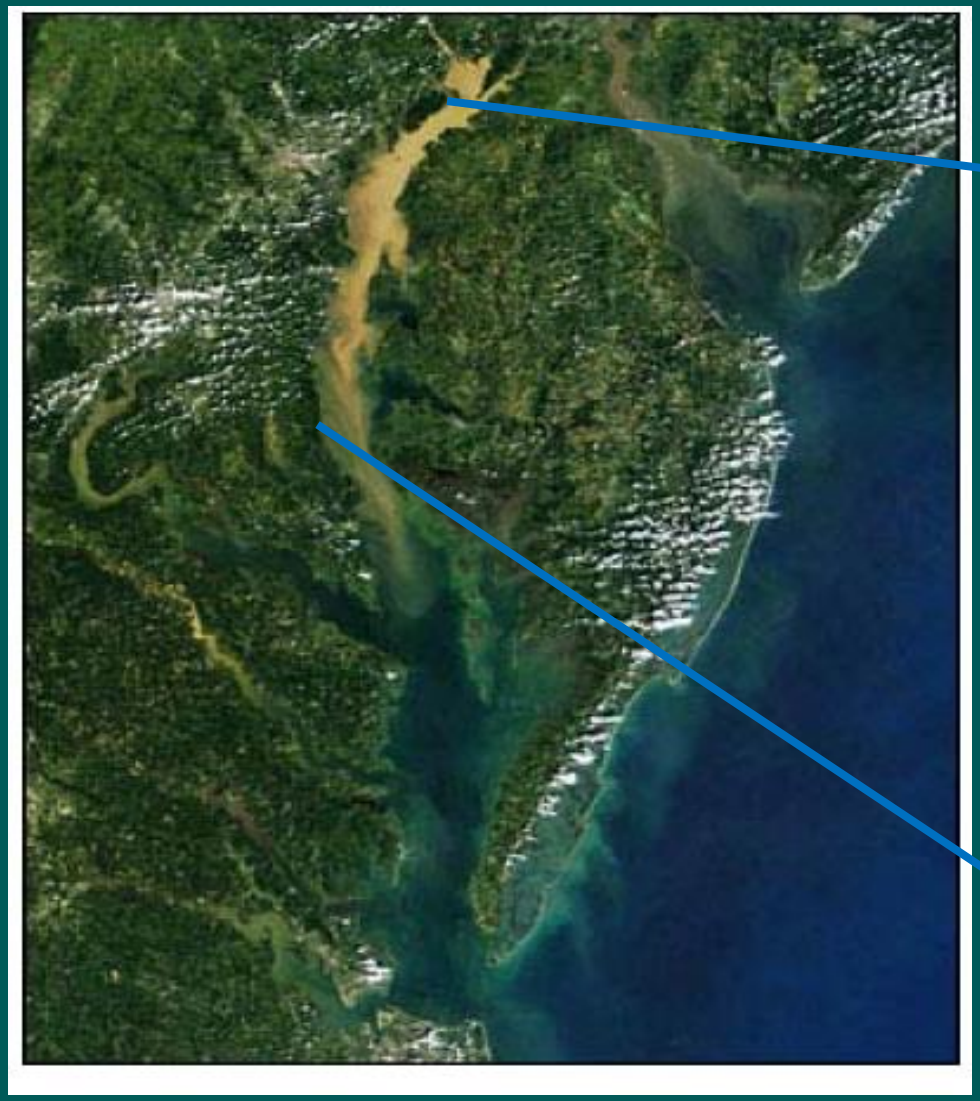
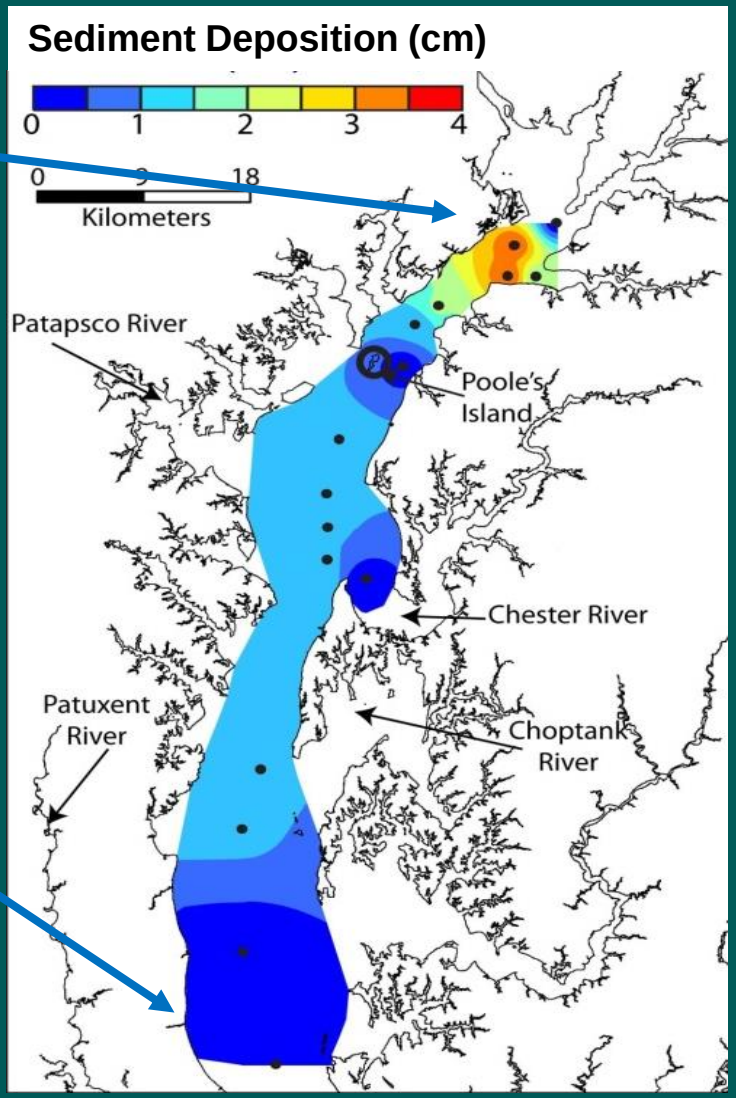


Photo Credit: NASA

What the Data Shows



Graphic courtesy of UMCES