

Potential to Develop CBP Sediment Targets for Climate Change and Conowingo

Gary Shenk - CBPO

WQGIT 7/26/2021

TMDL Sediment Allocation Method



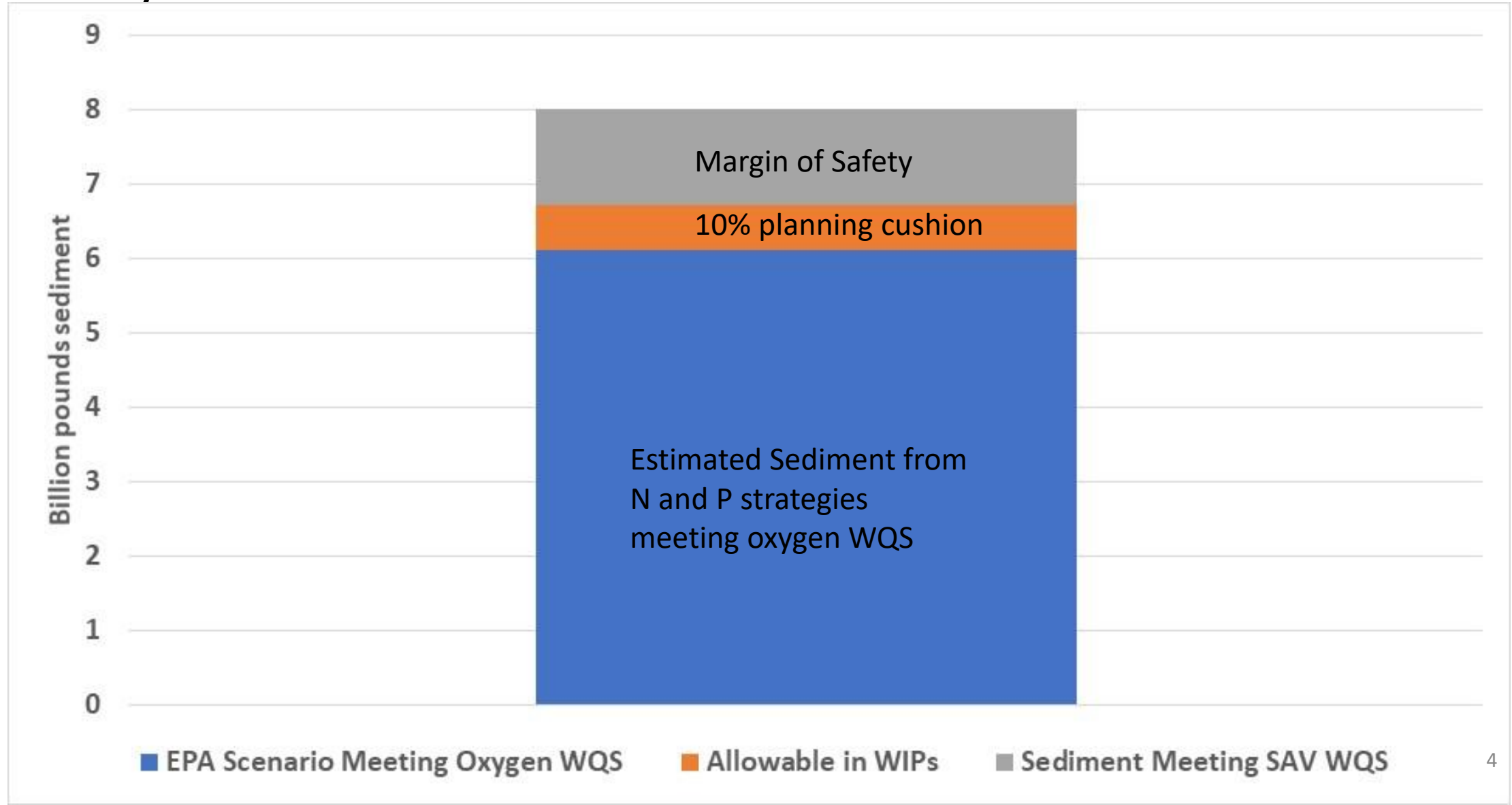
"It's easy! First you shoot the arrow, then you just take your paint brush and ..."

Fred McCarthy 1961: Brother Juniper²

Why is this OK? – 2010 TMDL document

- Initial estimate of sediment limits needed for Clarity-SAV standards would be about 8 billion pounds.
- EPA attainment scenarios for N and P resulted in modeled 6.1 billion pounds sediment
- 2-billion-pound cushion, however science for sediment is not as strong as that for nitrogen and phosphorus
- TMDL gave 10% cushion to jurisdictions (6.7 billion pounds) and used the rest for explicit margin of safety
- Purpose of the 10% cushion was to allow flexibility for N and P in WIPs
- Research has continued to demonstrate the primacy of N and P for WQS

Why is this OK? – 2010 TMDL document



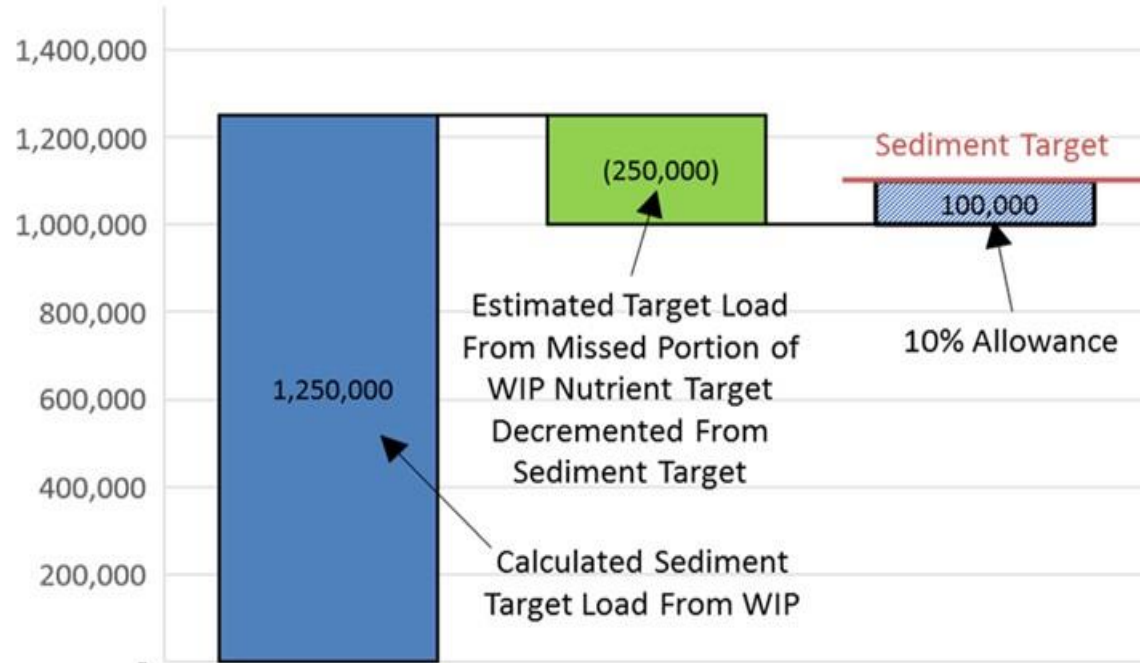
Phase II Sediment Target Load Methodology

- Add 10% to the sediment targets generated through the 2010 TMDL Level of Effort scenario to establish an upper limit
 - If N:P trades occur, adjust this upper limit with Phosphorus
- Set the final allocation based on the Phase 2 WIPs

**From 6/28/2011 Presentation on
development of Phase II Planning
Targets**

Sediment Target Calculation

Example: Basin Jurisdiction Missed Nutrient Targets



Example: Basin Jurisdiction Exceeded Nutrient Targets



**From 10/4/2019 Presentation on
development of Phase II WIPs**

TMDL Sediment Allocation Method

- Phase I and II
 - Sediment allowance 10% more than an EPA-generated attainment scenario
 - Sediment target set at WIP that meets the allowance
 - Allows flexibility during WIP process
- Phase III
 - Sediment target set at 10% more than WIP adjusted to meet the N and P target
 - Allows flexibility during milestone process



"It's easy! First you shoot the arrow, then you just take your paint brush and ..."

Fred McCarthy 1961: Brother Juniper

Climate Change and Conowingo

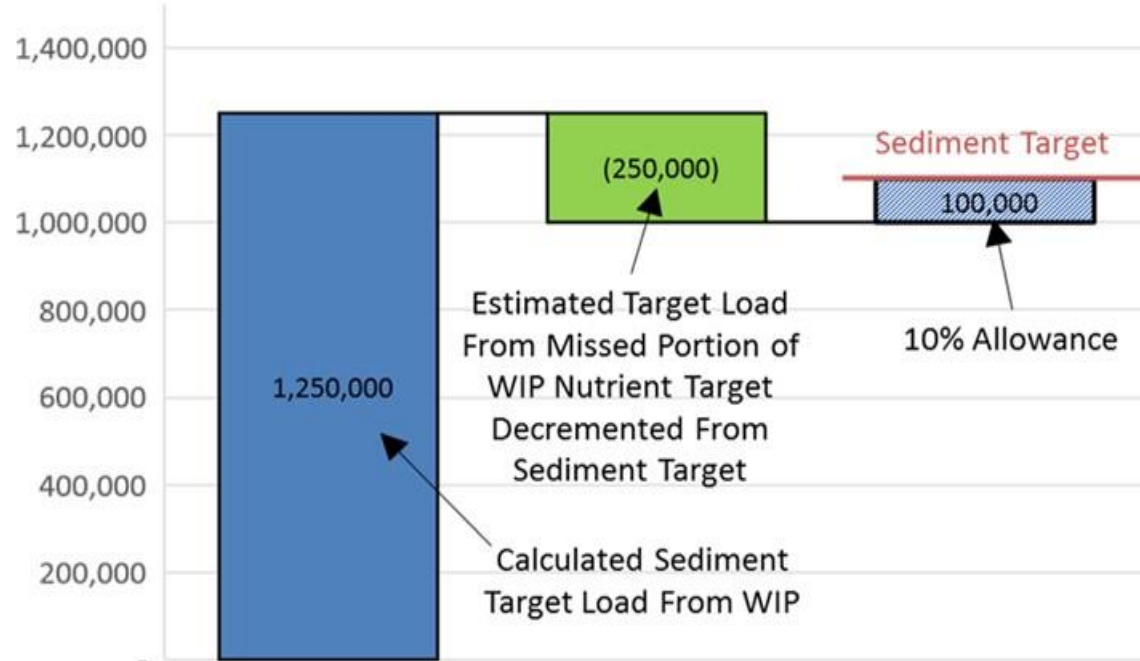
- The partnership decides.
 - No sediment targets because the partnership has not decided on a method
- Sediment does not typically drive implementation
- Some possible avenues follow

Climate change is an adjustment of planning targets

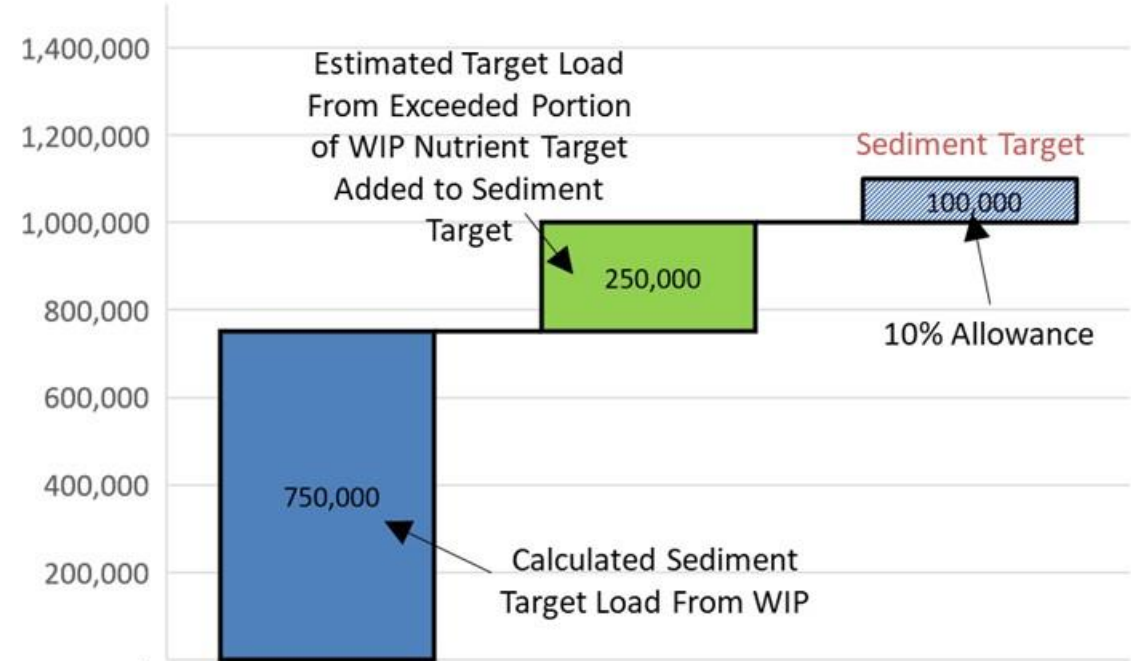
Major	State	StateBasin	2018 Planning Targets approved by PSC		2019 Planning Targets with Exchanges and Sediment			2020 Climate Adjustments		2020 Planning Targets with Climate	
			Nitrogen	Phosphorus	Nitrogen	Phosphorus	Sediment	Nitrogen	Phosphorus	Nitrogen	Phosphorus
Potomac	DC	DC Potomac	2.42	0.130	2.42	0.130	41.9	0.01	0.001	2.42	0.129
Eastern Shore	DE	DE Eastern Shore	4.55	0.108	4.55	0.108	26.7	0.04	0.003	4.51	0.105
Eastern Shore	MD	MD Eastern Shore	15.21	1.286	15.60	1.290	2903.4	0.37	0.032	15.23	1.258
Patuxent	MD	MD Patuxent	3.21	0.301	3.21	0.300	437.7	0.11	0.019	3.09	0.281
Potomac	MD	MD Potomac	15.30	1.092	15.80	1.090	1928.0	0.21	0.033	15.59	1.057
Susquehanna	MD	MD Susquehanna	1.18	0.053	1.60	0.050	113.8	0.14	0.007	1.46	0.043
Western Shore	MD	MD Western Shore	10.89	0.948	9.63	0.950	2959.9	0.31	0.020	9.32	0.929
Susquehanna	NY	NY Susquehanna	11.53	0.587	11.53	0.587	532.7	0.40	0.044	11.13	0.543
Eastern Shore	PA	PA Eastern Shore	0.45	0.025	0.46	0.022	27.4	0.05	0.005	0.41	0.017
Potomac	PA	PA Potomac	6.11	0.357	6.14	0.338	295.5	0.04	0.008	6.11	0.330
Susquehanna	PA	PA Susquehanna	66.59	2.661	66.87	2.544	1838.2	1.72	0.082	65.14	2.462
Western Shore	PA	PA Western Shore	0.02	0.001	0.02	0.001	0.3	0.00	0.000	0.02	0.001
Eastern Shore	VA	VA Eastern Shore	1.43	0.164	1.83	0.152	473.3	0.01	0.000	1.82	0.152
James	VA	VA James	25.92	2.731	21.81	2.241	2015.2	0.30	0.143	21.51	2.097
Potomac	VA	VA Potomac	16.00	1.892	16.51	1.823	1929.7	0.56	0.073	15.95	1.750
Rappahannock	VA	VA Rappahannock	6.85	0.849	7.09	0.819	1505.1	0.54	0.102	6.54	0.717
York	VA	VA York	5.52	0.556	5.71	0.548	949.1	0.17	0.018	5.54	0.530
James	WV	WV James	0.04	0.005	0.05	0.006	13.0	0.00	0.000	0.05	0.006
Potomac	WV	WV Potomac	8.18	0.427	8.18	0.427	595.9	0.00	0.008	8.18	0.418

Climate change is an adjustment of planning targets

Example: Basin Jurisdiction Missed Nutrient Targets



Example: Basin Jurisdiction Exceeded Nutrient Targets



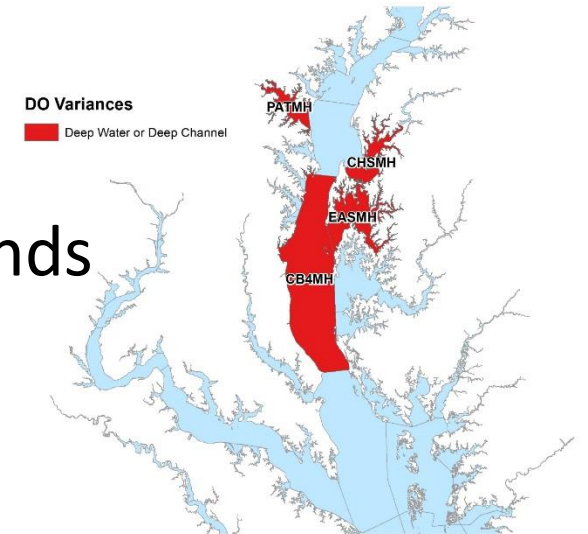
Can just apply the same rules as the Phase III WIPs

Estimated Loads to the Bay with Conowingo Dam and Reservoir at Infill Conditions

Additional Nitrogen Load: 13 million pounds



Additional Phosphorus Load: 1.8 million pounds

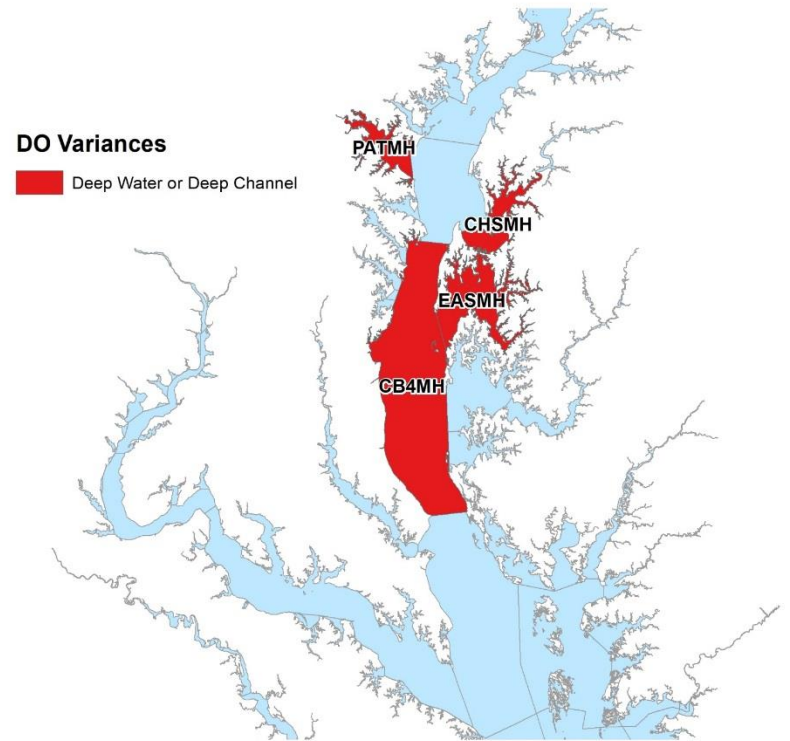


HOWEVER: These are less bioavailable nutrients and its delivery to Bay is dependent on large storm events. Therefore, only a smaller than expected (2 percent increase) in non-attainment in Middle Central Chesapeake Bay Deep-Channel. Equivalent to 6 million pounds of Nitrogen and 0.26 million pounds of Phosphorus

Estimated Loads to the Bay with Conowingo Dam and Reservoir at Infill Conditions

Additional **Nitrogen** Loads to be Addressed:
6 million pounds

Additional **Phosphorus** Loads to be Addressed:
0.26 million pounds



Estimated Loads to the Bay with Conowingo Dam and Reservoir at Infill Conditions

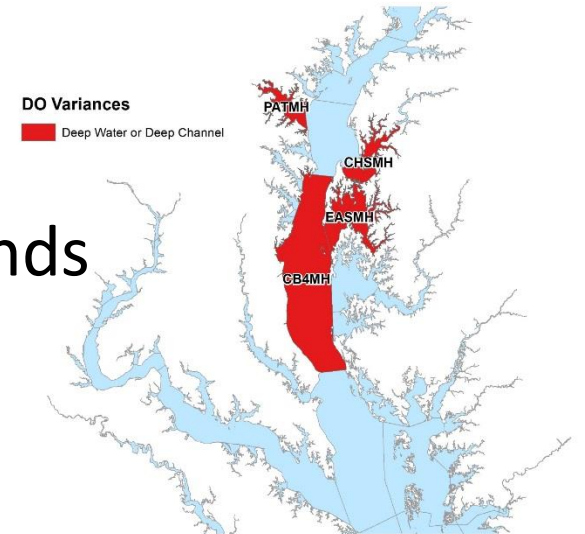
Additional Nitrogen Load: 13 million pounds



Additional Phosphorus Load: 1.8 million pounds



Additional Sediment Load: 1.7 billion pounds

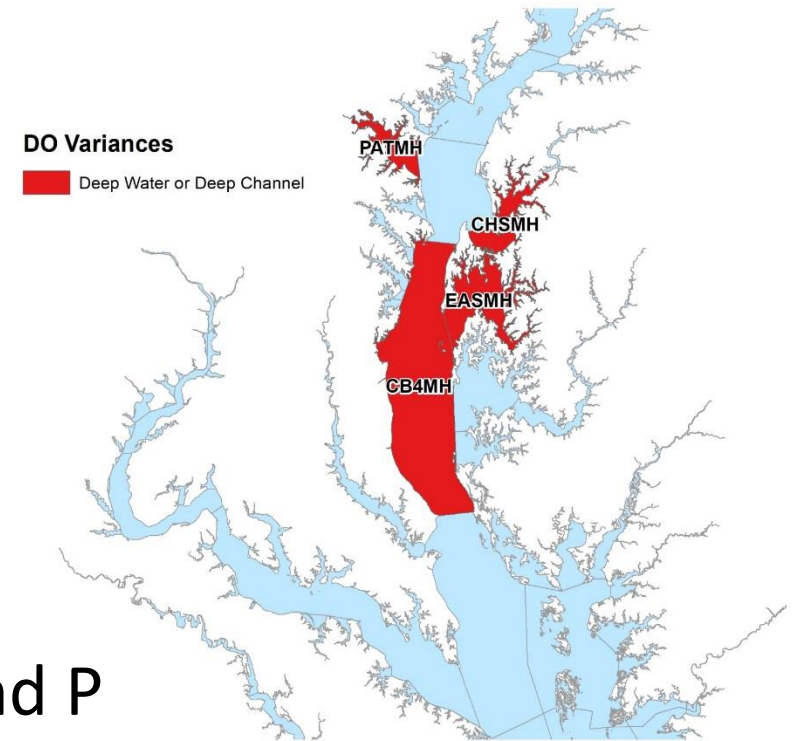


Estimated Loads to the Bay with Conowingo Dam and Reservoir at Infill Conditions

Additional **Nitrogen** Loads to be Addressed:
6 million pounds

Additional **Phosphorus** Loads to be Addressed:
0.26 million pounds

Additional **Sediment** Loads expected from N and P



Conowingo

- Sediment reductions are already assumed in the calculations
- Consistent calculation of sediment targets could be made once Conowingo WIP is developed.

Summary

- Sediment targets historically based on the reductions expected from N and P reduction plans
 - Targets raised slightly for planning flexibility
 - Still honors the margin of safety from the 2010 TMDL
- No sediment targets yet for climate or Conowingo
 - Partnership decides
 - Approaches exist that are comparable to previous partnership decisions