| Scenario Details for CWIP Runs to Date | Geography (from smallest to largest) | | | | | |
|---|---|---|---|---|---|---|
| | **Scenario 1:** MD and PA N-effective geobasins in Phosphorus Shell | **Scenario 4:** N-effective LRSs in the Susquehanna River Watershed | **Scenario 5:** N-effective LRSs in the Susquehanna River Watershed | **Scenario 6:** N-effective LRSs in Phosphorus Shell | **Scenario 2:** N-Effective Segments Throughout the Bay Watershed | **Scenario 3:** N-Effective Segments Throughout the Bay Watershed |
| Jurisdictions Included | MD and PA only | MD, PA and NY | MD, PA and NY | DE, MD, NY, and PA | DE, MD, NY, PA, VA, WV | DE (?, shown as negative), MD, NY (?), PA, VA, WV |
| % of total by unit of Implementation (acres, feet, etc.) by Jurisdiction | MD = 19%<br>PA = 81% | MD = 3%<br>PA = 93%<br>NY = 4% | MD = 2%<br>PA = 93%<br>NY = 5% | DE = 0.1%<br>MD = 10%<br>NY = 8%<br>PA = 81.9% | DE = 3%<br>MD = 6%<br>NY = 14%<br>PA = 67%<br>VA = 9%<br>WV = 1% | DE = 0%<br>MD = 7%<br>NY = 0%<br>PA = 91%<br>VA = 0.5%<br>WV =0.5% |
| BMPs | Forests, wetlands, stream restoration, shoreline management, and bioswales | Cost-effective Agricultural Practices | Cost-effective Agricultural Practices and Urban Forest (buffers & planting) | Cost-effective Agricultural Practices and Urban Forest (buffers, planting, bioswales) | Jurisdiction WIP 3 BMPs increased by 25% (variable by jurisdiction) | Cost-effective Agricultural Practices |
| Cost/Pound (annualized) | $61.31 ($367,838,818/yr) | $7.71 ($51,032,822/yr) | $7.77 ($51,298,783/yr) | $19.80 ($123,619,243/yr) | $38.68 ($235,908,443/yr) | $7.99 ($50,987,795/yr) |
| Total N Reduction | 6,000,026 lbs/yr | 6,615,658 lbs/yr | 6,601,250 lbs/yr | 6,243,685 lbs/yr | 6,098,728 lbs/yr | 6,376,678 lbs/yr |
| Capacity/Feasibility Assumptions | Unknown | Unknown | Unknown | Unknown | 25% above WIP 3 | Unknown |
| Steering Committee | Not recommended: not cost- | Move Forward for Further Comparison: | Move Forward for Further Comparison: | ?: Is it just the bioswales that | Not recommended: not cost- | Move Forward for Further Comparison: |

**Commented [MR1]:** Looks like the quartiles vary based on geography. I.e., the deck is reshuffled for effective LRSs each time geography changes. Also, the upper quartile of effective LRSs used, which could be reconsidered as the statistic.

| | | | | | | |
|---|---|---|---|---|---|---|
| Recommendation and rationale | effective, N-effectiveness at geobasin scale, too limited geographically | Cost-effective and in most effective LRS areas. | Cost-effective and in most effective LRS areas. | increase the costs? | effective, violates effectiveness by arbitrarily assigning same level of effort across both effective and not effective jurisdictions. | Cost-effective and in most effective LRS areas, creates biggest opportunity for practices though need to correct some of the weirdness with NY and DE |

Key Points on Above:

- No real appreciable difference in price as you increase scale. Also, costs do not capture incremental increases as you get closer to implementation capacity and broadest scale could open up the broadest opportunity/capacity and lower implementation costs.

| Jurisdiction | Jurisdiction Draft Nitrogen Allocations (M lbs./year, % of total load) | Phosphorus Load Reductions (M lbs/year) |
|---|---|---|
| New York | 0.32 (4.3%) | 0.011 |
| Pennsylvania | 3.31 (45.5%) | 0.113 |
| Maryland | 1.76 (24.2%) | 0.091 |
| West Virginia | 0.19 (2.6%) | 0.015 |
| District of Columbia | 0.00 | 0.001 |
| Delaware | 0.32 (4.4%) | 0.005 |
| Virginia | 1.38 (19%) | 0.155 |
| Basin-wide | 7.28 | 0.392 |

* Table reproduced from letter from the US EPA Region 3 Regional Administrator to the Principal's Staff Committee Members, October 26, 2018 (US EPA, 2018).

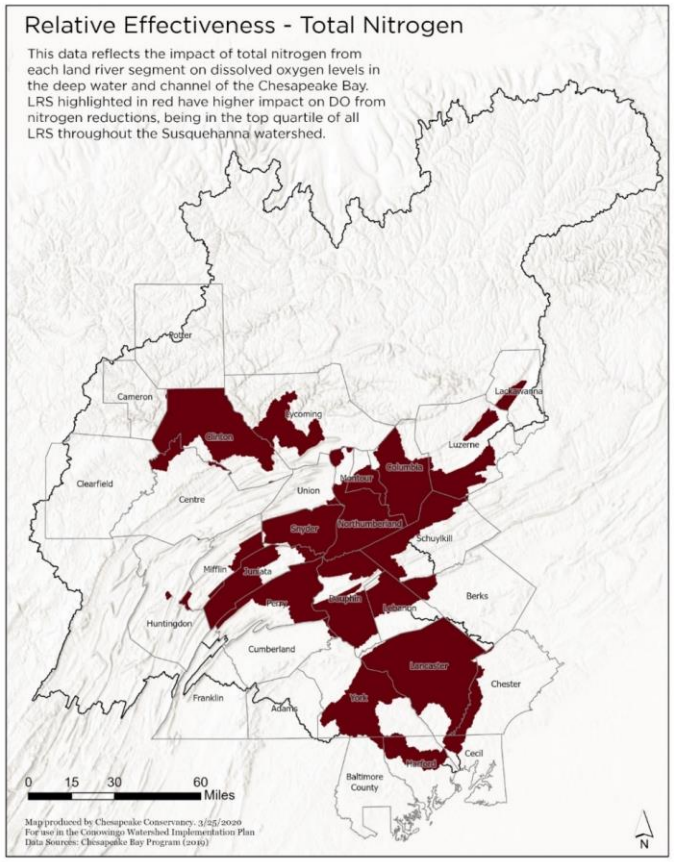
**Commented [MR2]:** EPA suggested this table also include phosphorus as well as a description of how these allocations were derived.

**Most Directly Comparable CWIP Scenarios for Further Consideration**

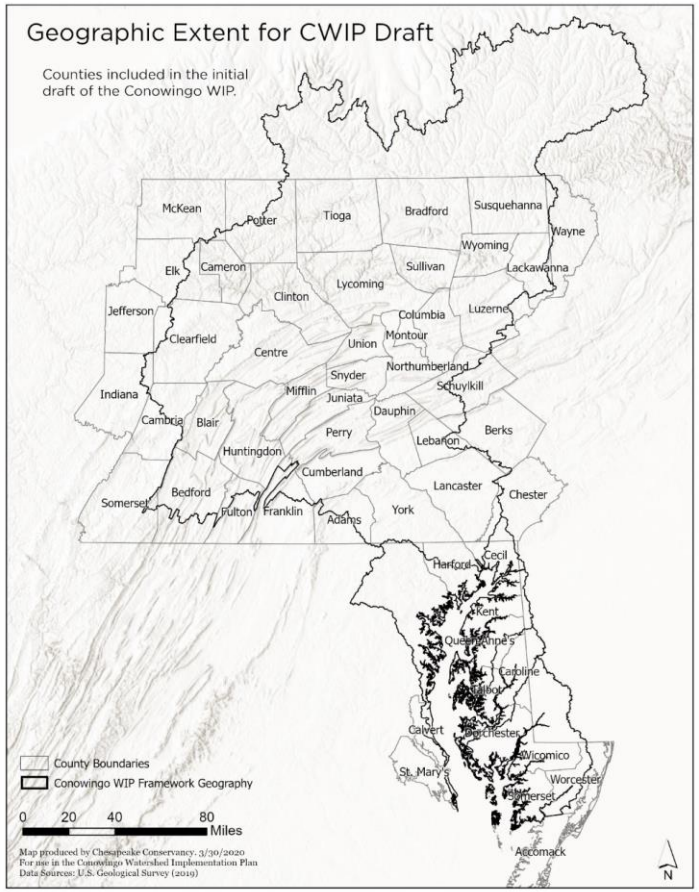
| | 1. N-effective LRSs segments in the Susquehanna River Watershed | 2. N-Effective LRS in the Phosphorus Shell (Susq Plus) | 3. N-effective LRSs throughout the Bay watershed |
|---|---|---|---|
| Cost-effective Ag BMPs (scen 4 BMPs) | Scenario 4 (Susq. Only) | Not a current scenario | Scenario 3 (baywide) |
| Cost-effective Ag BMPs Costs/Pound (annualized) | $7.71 ($51,032,822/yr) | Not a current scenario | $7.99 ($50,987,795/yr) |
| Cost-effective Ag BMPs + 2 cost-effective urban BMPs (Scen 5 BMPs) | Scenario 5 (Susq. Only) | Essentially Scenario 6 (already run, though appeared to have more urban BMPs than Scenario 5) | Not a current scenario |
| Cost-effective Ag BMPs + 2 cost-effective urban BMPs Costs/Pound (annualized) | $7.77 ($51,298,783/yr) | $19.80 ($123,619,243/yr) | Not a current scenario |

**Commented [MR3]:** Katherine had the "shell" twice, so I replaced with Susquehanna River Watershed only to reflect a smaller scale than the shell. Also, these have already been run for comparison

Scenario 4 & 5 Geography



Scenario 6 Shell Geography



Scenario 3 Geography