Questions posed by WA Department of Ecology and EPA Region 10
Answers provided by Rich Batiuk, U.S. EPA Chesapeake Bay Program Office
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Q: ***How did the stakeholders come up with the nutrient load allocations?***
A: Actually, EPA and its six watershed states and District of Columbia partners reached agreement on the basinwide nitrogen, phosphorus, and sediment cap loads and then on the 19 major river basin by jurisdiction allocations. At that point, the states took on the responsibility for developing the more geographically and source sector specific waste load and load allocations working with their local governments and multitude of stakeholders.

Q: ***How are they working with the agricultural community to implement BMPs to meet the load allocations?***
A: Through a multi-prong approach. Within the Chesapeake Bay TMDL, the states made specific allocations to the agricultural community, including waste load allocations to CAFOs and load allocations to the rest of agriculture. Then through their watershed implementation plans or WIPs, the state further described and documented their plans for how they were going to work with the agricultural community on achieving their share of the state's overall nutrient and sediment reductions under the Bay TMDL. States are heavily depending on USDA Farm Bill programs for both extensive cost sharing of agricultural conservation practices as well as technical assistance delivery. Several of the Bay watershed states (e.g., Maryland, Virginia, and Delaware) have funded state cost share programs as well. And all six states receive millions of dollars in form of annual Chesapeake Bay Implementation Grants and Chesapeake Bay Regulatory and Accountability Grants to help pay for more field staff in the conservation districts, cost shared practices, and program implementation. Finally, through the development of and EPA evaluation of progress towards achieving two year milestones, each of the six states must make very detailed commitments for agriculture program implementation and capacity building through programmatic and numerical load reduction milestones.

Q: ***How "prescriptive" were the allocations?***
A: Like most TMDL, the Chesapeake Bay TMDL documented the six states and the District of Columbia's decisions on the facility specific allocations to over 470 significant municipal and industrial wastewater treatment and discharging facilities and aggregate WLAs to almost 3,000 non-significant facilities by the 92 watersheds draining to the Chesapeake Bay. WLAs to other regulated sources—e.g., MS4s and CAFOs—were also aggregated by watershed by state. Through their WIPs and through their efforts to bring the allocations to a more local (e.g., county in Maryland) scale, the states have been the ones prescribing, not EPA.

Q: ***What have been some of their successes and failures implementing agricultural BMPs?***
A: The successes have been implementation of cover crops, riparian forest buffer implementation (until the past several years), low till and no till practices, phytase in feed for poultry and swine, grazing management, and seeing the results show up as improving water quality conditions in local stream and rivers in agriculture dominated small watersheds. Our challenges have been nutrient management plans—not the writing thereof, but ensuring the implementation of, the right use of manure/litter as fertilizer, phosphorus saturation of soils, stream fencing, getting all six states to invest in state-based cost share programs, and having enough field staff—county conservation districts, state, and NRCS/FSA—to effectively deliver conservation programs in both cost share and technical assistance at the levels needed to match with the states' watershed implementation plans.

Q: ***How are the multiple states involved tracking implementation activities?***
A: The states has the ultimate responsibility for tracking, verifying, and reporting on implementation activities across all source sectors regardless of who originally implemented the practice. Given the states are ultimately held responsible for meeting their Bay TMDL allocations, they need to be responsible for the practice data used as one means of evaluating progress towards those Bay TMDL allocations. So they are involved in all aspects all the way up to the point of delivery of the annual progress data to EPA, working with local governments, NGOs, federal facilities, USDA, individual permitted dischargers, and more. The Chesapeake Bay Program Partnership has been working on a basinwide BMP verification framework over the past two years, clearly outlining expectations for greatly enhanced verification of the thousands of practices tracked and reported each year. So the states are now revising and enhancing their existing BMP tracking and reporting programs to include more verification.

Q: ***Are there any examples of where they found DO standards in the Bay would be nearly impossible to meet (similar to Budd Inlet)?***
A: Yes, prior to Maryland, Virginia, Delaware, and the District of Columbia's adoption of the consistent set of Chesapeake Bay water quality standards for dissolved oxygen in the 2004-2006 timeframe, Maryland's and Virginia's dissolved oxygen standards for the deeper waters of the Chesapeake Bay would not have been achieve in 1607 when John Smith sailed into the Chesapeake. EPA, working with the states, followed the use attainability analysis or UAA process to provide a public demonstration that the then existing standards were unattainable for natural reasons and human caused conditions that could not be remedied. Through a lot of hard work and solid scientific evidence, we got the environmental advocacy community on board prior to the states' individual, yet coordinated water quality standards promulgation processes.

Q: **More details about their model and how its assumptions, inputs and outputs compare to our South Puget Sound model.**
A: You can literally find thousands of pages of model documentation on the Partnership's web site and on the Chesapeake Community Modeling Program's website at:

- Chesapeake Bay Program information on modeling: http://www.chesapeakebay.net/about/programs/modeling
- Chesapeake Bay Program specific information on the Phase 5.3.2 Watershed Model: http://www.chesapeakebay.net/about/programs/modeling/53

- Chesapeake Community Modeling Program information on the Phase 5.3.2 Watershed Model: http://ches.communitymodeling.org/models/CBPhase5/index.php
- The modeling and monitoring sections of the Chesapeake Bay TMDL documentation: http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/CBayFinalTMDLSection5_final.pdf

Q: ***How were the tidal water segments delineated?***
A: The tidal water segments were delineated based on a combination of: long term salinity levels (tidal fresh, oligohaline, mesohaline, and polyhaline), natural geographic delineations (e.g., medium to smaller sized tidal rivers were set as individual segments), hydrodynamic processes (e.g., the lower Chesapeake Bay is split into two adjoining segments due to two separate flow patterns). The following detailed documentation is available online at:

Chesapeake Bay Program. 2005. *Chesapeake Bay Program Analytical Segmentation Schemes: Revision, decisions and rationales, 1983-2003—2005 Addendum.* EPA 903-R-05-004. CBP/TRS 278/06. Chesapeake Bay Program Office, Annapolis, MD.
http://www.chesapeakebay.net/content/publications/cbp_13378.pdf

Chesapeake Bay Program. 2004. *Chesapeake Bay Program Analytical Segmentation Schemes: Revision, decisions and rationales, 1983-2003.* EPA 903-R-04-008. CBP/TRS 268/04. Chesapeake Bay Program Office, Annapolis, MD.
http://www.chesapeakebay.net/content/publications/cbp_13272.pdf

Q: ***The TMDL recently withstood a very substantial legal challenge to its load allocations. What did EPA learn during the lawsuit and what changes, if any, did it make to the model and/or its assumptions?***
A: Having been through the first round of the legal challenge and well into the appeal process, we learned a lot about what we did right leading up to the publication of the Chesapeake Bay TMDL. Here's a short listing of what worked in getting an outstanding 99 page judgment from the federal circuit court ruling in EPA's favor on ALL counts:

- Keep all aspects of the TMDL development process open to the public, clearly publicized, with all relevant meeting notices, summaries, presentations, etc. web accessible.
- Use a well-established, consensus-based, collaborative and shared decision making management structure through which to make the literal thousands of small, incremental decisions which ultimately result in such a multi-state, watershed-wide TMDL.
- Set up a very big, encompassing tent and invite many colleagues to and join you…but plan to put them to work cause only through sweat, shared experiences, and application of many fingerprints, will you go from 'your (as in EPA) TMDL' to 'our allocations and implementation plans.'
- Start with re-building a rock solid water quality standards foundation, including designated uses the public can understand and see, to criteria tailored to support those individual uses (and derived by your own scientific community and blessed by your management community), and criteria assessment procedures that remove all guess work as to whether a water body is consider impaired or not.

- Document, document and then document some more and ensure the entire record of documentation is and has always been available on-line to anyone who is interested.
- Build consensus at every single step along the road and in every element of the allocation process itself.
- Ensure you subject all your models and other decision support tools to independent scientific peer review and back them up with extensive documentation on every single thing contained with each model and tool.
- Build in specific times where new scientific understanding as well as experiences and lessons learned from management and implementation efforts to date can be considered and factored into the suite of decision support tools and the decision making process itself. And then seal this with shared agreements on how you plan to move forward with this new, enlightened understanding. (We built in a 5-7 year process to do exactly that…and started it back in 1985 and it has paid off many, many fold since then.)
- EPA setting clear expectations throughout the process and documenting those expectations in writing after extensive consultation with jurisdiction partners.
- Establishing a clear, well structure accountability system which provides regular reporting to the public and has built-in feedback and 'incentives' when states don't meet their public commitments.

Looking back now, there is actually not a lot we would have changed beyond providing more documentation of the suite of Chesapeake Bay models earlier in the process.

Q: ***What was the role of shellfish in nutrient reduction in the Bay?***
A: Given our current oyster stocks are about 1 percent of historic stocks at their peak in the 1880s, they are a minor contributor. We have oysters and their filtration incorporated into our Chesapeake Bay water quality/sediment transport model so we are positioned to potentially credit future oyster restoration.

Q: ***Did the TMDL consider sediment/nutrient dynamics? If not, why?***
A: Yes. The Chesapeake Bay Program Partnership's Chesapeake Bay water quality/sediment transport model included submodels focused on nutrient fluxes from and exchanges with the bottom sediments as well as sediment transport and resuspension dynamics.

Q: ***Atmospheric deposition is a significant source of nitrogen in the CB TMDL. How will the TMDL allocate loads to upwind sources?***
A: The 2010 Chesapeake Bay TMDL includes an entire appendix devoted to this topic—Appendix L—for your reading pleasure. The bottom-line was the Partnership conducted extensive airshed modeling (backed by decades of atmospheric deposition monitoring at an extensive network of stations across the watershed) of anticipated Clean Air Act regulations and likely future implementation. The anticipated atmospheric nitrogen deposition reductions to the 64,000 square mile watershed and direct to tidal surface waters through 2020 were determined than then factored in the states' allocations (for the watershed) and EPA's allocation (for the tidal waters).

Q: ***How were load allocations divided among the states and did the states further allocate to counties/cities?***

A: As mentioned above, EPA, working with the six states and the District of Columbia partners reached agreement on the basinwide nitrogen, phosphorus, and sediment cap loads and then on the 19 major river basin by jurisdiction allocations. At that point, the states took on the responsibility for developing the more geographically and source sector specific waste load and load allocations working with their local governments and multitude of stakeholders. As described in broad terms and detailed documentation, the scaled sets of allocations were developed using a combination of inputs to and output from a series of linked models as well as a series of well vetted allocation decision rules and tools. The States then allocated their Bay TMDL cap loads down to their portions of the 92 watersheds draining into the 92 tidal Bay segments. EPA had requested the states develop more local targets as part of their development of their Phase II Watershed Implementation Plans, but backed off given the Partnership's Chesapeake Bay watershed model did not fully support going do to the county scale everywhere in the watershed. Maryland did end up developing county-level targets within their Phase II Watershed Implementation Plan. As part the development of their Phase III Watershed Implementation Plans in 2018, the states will be developing these local targets as EPA and the larger Partnership are re-developing the Chesapeake Bay watershed model to more accurately simulate at those local scales.

Q: ***In the PowerPoint presentation, the loads are presented in units of mass per year, which doesn't indicate the impact the TMDL has on the WWTPs and agriculture. What percent reduction is required from Ag, and what are the concentration limits that the WWTPs will ultimately have to look at in terms of upgrades/performance?***

A: Both answers are truly state specific as the relative contributions to total loads from each state varies significantly depending on distribution of the different source sectors. The concentration limits also vary by state given the relative sizes of the facilities, their distance from tidal waters, and how much each state is depending on wastewater reductions to achieve their TMDL allocations. Generally, TN concentration varied from 3 mg/L in MD, VA, DE and DC to 5-8 mg/L in PA, WV, and NY. TP concentration were generally in the 0.1-0.3 mg/L range in the states closest to the Bay.

Q: ***Also, what are the instream water quality levels that are needed to meet the DO standard - - and how do those in-stream levels compare to EPA's ecoregional criteria?***

A: In the case of the Chesapeake Bay TMDL, all the allocation were based on achieving the states' Chesapeake Bay water quality standards for dissolved oxygen, water clarity, restoration acreages of underwater Bay grasses, and chlorophyll a. In stream water quality criteria/standards did not factor in.