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**CHESAPEAKE BAY TMDL:
Nutrient Allocation Methodology and
Reasonable Assurance Analysis**

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Background

- **POTW Nutrient Removal**
 - Bay region POTWs got on nutrient removal train long ago
 - Mid-1990s (for TN), even earlier for low-level TP limits
 - Now, PS currently ~20% of N & P loads
 - Upgrades in progress will cut PS load to ~ 10-15% of total
- **Significant PS & NPS Reductions**
 - Don't believe everything you read about the Chesapeake
 - Much of it is overstated or misleading
- **Issue Is How to Continue Progress**
 - Esp. on further reducing agricultural loads
 - Esp. on “headwater states” of PA, NY, WV, DE

EPA-Lead TMDL With State Input

- EPA determined total assimilative capacity
 - Nitrogen, Phosphorus, and Sediment
- EPA determined interstate allocations
 - Ex: DC-Potomac, MD-Potomac, VA-Potomac
- States do Watershed Implementation Plans (WIPs)
 - Point Source WLAs & Nonpoint Source LAs
 - Policies for implementation (more laws, regs, \$\$\$, etc)
- EPA judges draft State WIPs under new Reasonable Assurance criteria
 - EPA/States negotiate changes
- EPA issues TMDL with final WLAs & LAs to its liking

Chesapeake Bay TMDL Allocation Methodology

Allocation Principles

- **Attain WQS**
 - “The allocation loads should protect the living resources of the Bay and its tidal tributaries and result in all segments of the Bay mainstem, tidal tributaries, and embayments meeting WQS for DO, chlorophyll a, and water clarity.”
- **Address the Biggest Problems**
 - Of the 19 major river basins that contribute, those that contribute most to the Bay water quality problems must do the most to resolve those problems (on a pound per pound basis)
- **Credit Pre-TMDL Reductions**
 - All tracked and reported reductions in nutrient loads are credited toward achieving final assigned loads
 - % reductions determined from “No Action” control scenario

Two Key Concepts for Bay TMDL

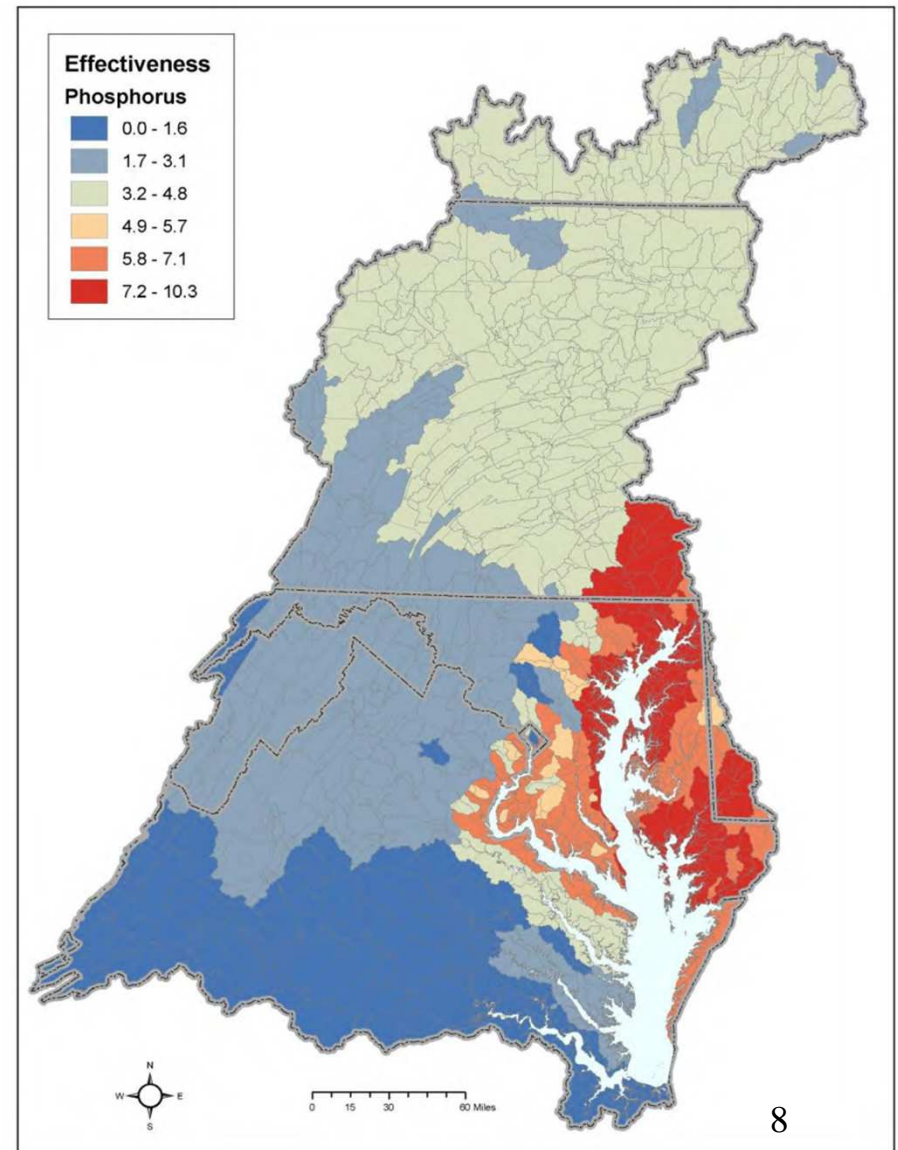
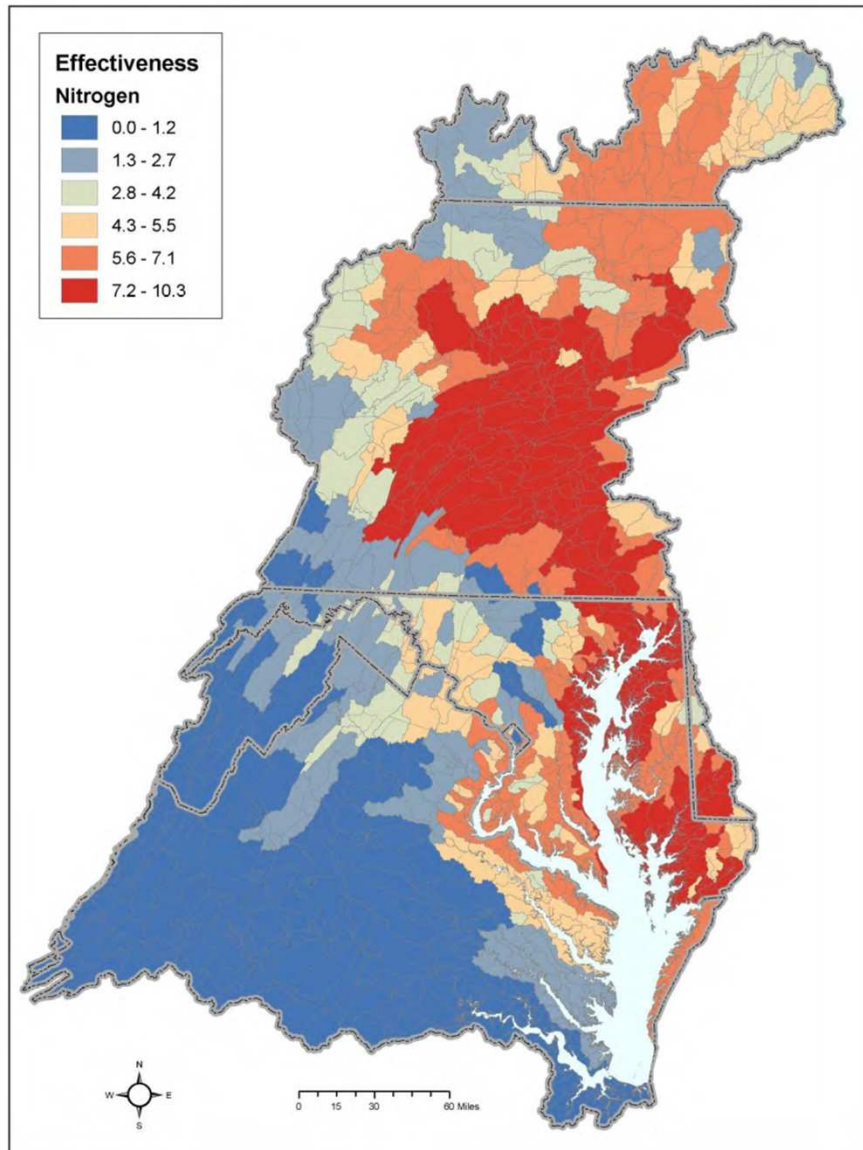
- **Relative Effectiveness (“WHERE”)**
 - Account for the geographic and source loading influence of individual major river basins on tidal water quality
- **Controllable Loads (“WHAT”)**
 - Unlike some other TMDLs, this one focuses on what is at some (tough) level at least doable
 - PS and NPS limit-of-technology definitions distinguish controllable from uncontrollable loads

***Integrate these concepts to answer the “WHO”
(sources & allocations) of this TMDL***

Relative Effectiveness Generally

- **Natural Attenuation of Loads**
 - Reduction during riverine transport to tidal water
 - Reduction during estuarine transport to area of concern
- **Findings**
 - Loads discharged to northern river basins: High Impact
 - Loads discharged to southern basins: Low Impact
- **Conclusions**
 - Real estate adage of “location, location, location” applies
 - Downstream benefit of controls depends on WHERE in this large watershed that the controls are applied

Relative Effectiveness Scale (N & P)



Controllable Loads

- **The Technology Standard of the Future**
 - “Everything by Everybody Everywhere” (“E3”)
 - A limit-of-technology concept
- **E3 Sausage Factory for the Chesapeake**
 - Subject matter experts define the outer limits of technology by source sector (POTW, Ag BMPs, etc)
 - Only very limited consideration of extreme costs
 - Generally E3 definitions are based on technical feasibility, not cost or cost-benefit

Is it any wonder that Affordability is increasingly the issue in water regulation?

Controllable Loads (cont.)

- **POTW “E3” Definition**
 - TN = 3 mg/L (annual avg.)
 - TP = 0.1 mg/L (annual avg.)
- **General Bias Favoring Point Source Regulation**
 - PS regulation is what EPA knows and does best
 - General sense that PS controls are “more reliable”
 - Shifts some burden to States with PS loads, which partly responds more rural States’ concerns about lost growth opportunity

Integrate Controllable Loads (“E3”) & Relative Effectiveness

- **Basic Assumptions**

- Greater level of effort in more influential basins
- Greater level of effort by PS than NPS as % of E3

- **Objectives**

- Balance the TMDL equation to meet WQS
- Hold the States together in the TMDL
- Later be able to hold the TMDL together (defend it)

- **Approach**

- Produce complex technical products
- Embed policy decisions in model assumptions
- Make a graph ...

State-Basin Allocation Curves

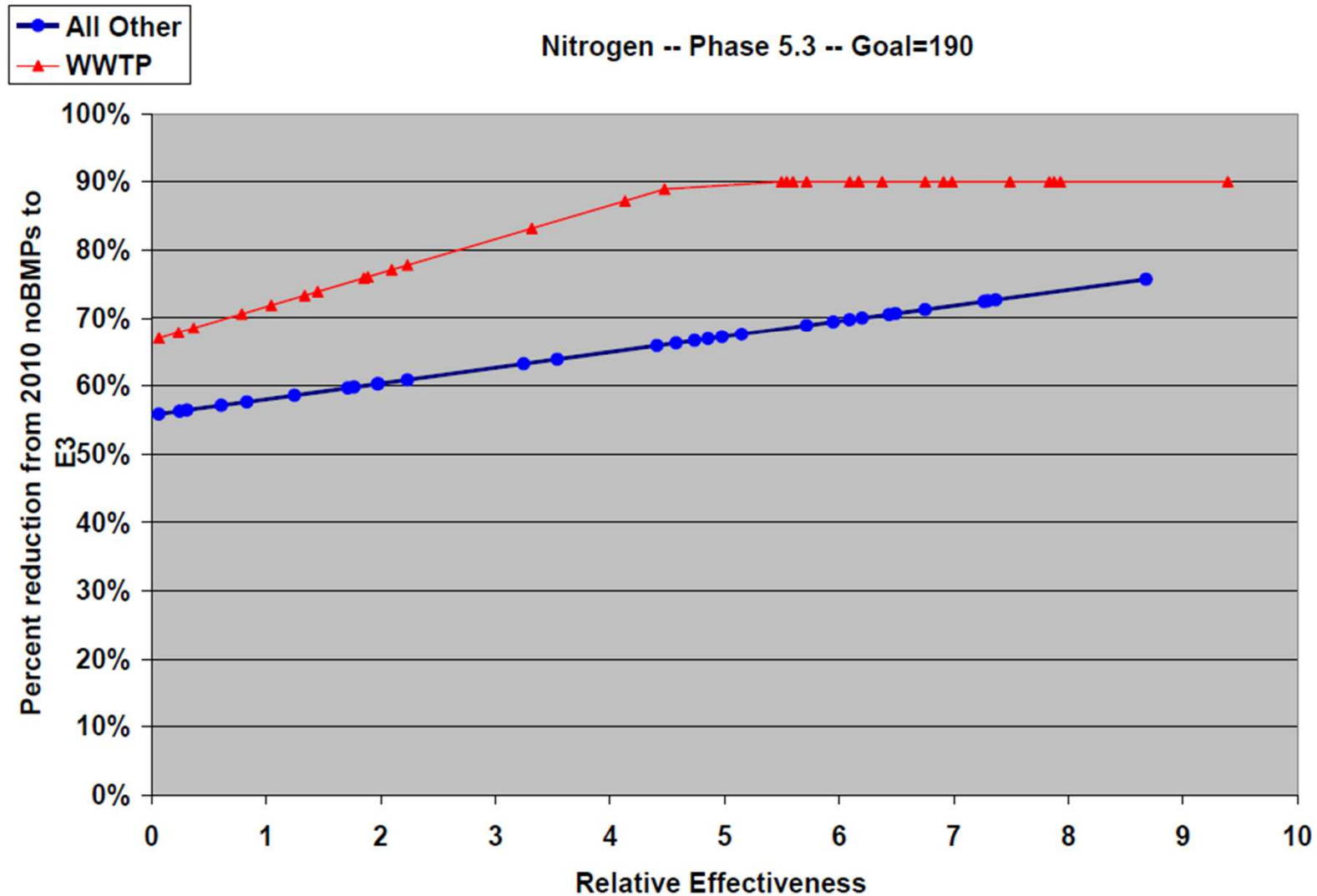


Figure K-2. Allocation methodology example showing the “hockey stick” and straight line reductions approaches, respectively, to wastewater (red line) and all other sources (blue line).

Allocation Curves (cont.)

- **Credit for Pre-TMDL Efforts**
 - Use of 2010 “No Action” scenario as baseline gives credit for extensive pre-TMDL efforts (nutrient reductions) made
- **Slope of the Lines**
 - Much flatter than Relative Effectiveness would dictate
 - Inherently inefficient allocation based largely on policy
- **Point Source “Hockey Stick”**
 - Upper end: TN = 4.5 mg/L, TP = 0.22 mg/L
 - Lower end: TN = 8 mg/L, TP = 0.54 mg/L
 - The Inflection Point

States Set WLAs & LAs

- **State Flexibility**
 - States not bound to same assumptions in WIPs
 - May transfer allocations among in-State basins
 - May trade of N and P
 - May increase or decrease PS and NPS level of effort
- **All Subject to EPA Oversight of course**
 - Sum of State's WLAs and LAs must not exceed TMDL
 - “Reasonable Assurance” of NPS implementation ...

Chesapeake Bay TMDL Reasonable Assurance

***“Neither the Clean Water Act nor EPA’s
regulations provide a definition of
‘reasonable assurance.’”***

**EPA Region III Administrator
September 11, 2008**

EPA's Asserted Statutory & Regulatory Basis for RA

- **CWA § 303(d)(1)(C):** TMDLs “shall be established at a level necessary to implement the applicable water quality standards.”
 - According to EPA, requiring RA ensures that TMDLs are established “at the necessary level to implement” WQSs
- **40 C.F.R. § 130.2(i):** “If BMPs or other NPS pollution controls make more stringent LAs practicable, then WLAs can be made less stringent.”
 - According to EPA, RA guarantees more stringent LAs are in fact “practicable”

EPA Guidance Discussing RA

- **1991 Guidance**

- “[T]o allocate loads among both NPS and PS, there must be RAs that NPS reduction will in fact be achieved. Where there are not RAs, under the CWA, the entire load reduction must be assigned to PS.”
- When PS permits depend on credit for future reductions by NPS, the record must show either
 - “there is RA that NPS controls will be implemented” or
 - “NPS reductions are demonstrated through an effective monitoring program”

- **Other References:** 1997 Guidance, 2002 Guidance

EPA's July 2000 TMDL Rule (Withdrawn March 2003)

- **Definition of Reasonable Assurance**
 - “a demonstration that TMDLs will be implemented through regulatory or voluntary actions, including management measures or other controls, by Federal, State or local governments, authorized Tribes, or individuals”
- **Four-Part Test for NPS RA Demonstration**
 - Specifically apply to the TMDL's pollutant & waterbody
 - Will be implemented as expeditiously as practicable
 - Will be accomplished by reliable/effective delivery mechanisms
 - Will be supported by adequate water quality funding
- **Rule withdrawn, but still reflects EPA's views**

EPA-Chesapeake Bay Foundation Settlement Agreement (May 2010)

- **Public Program, Private Settlement**
 - EPA could have easily won but never vigorously defended
 - Instead, EPA chose to privately negotiate the terms of an important public program with one NGO
 - Conveniently bolsters EPA's "authority" and attempts to lock-in exercise of its discretion
- **Role of Prior EPA Bay Guidance in Settlement**
 - "Requires" the Chesapeake Bay TMDL to "reflect EPA's decisions regarding the sufficiency of the demonstration of RA and other commitments in the seven Bay Watershed Jurisdictions' WIPs and two-year milestones provided by the jurisdictions"

As With Wet Weather Decrees, It All Comes Back to Scope & Schedule

- **Major Scope of Work**
 - In 2003 cost estimated at about \$30 Billion for CBP States
 - Total costs probably in the \$50B to \$100B range
 - Urban stormwater assumptions drive costs at high end
- **Short Fixed TMDL Implementation Schedule**
 - Bay States agreed to a schedule (again)
 - 60% by 2017 (frontloaded schedule)
 - 100% by 2025 (finish within 15 years)

Accountability Framework: Four Elements

- **States develop WIPs (WLAs and LAs)**
- **States develop 2-year milestones**
- **EPA tracks progress**
- **EPA imposes “consequences” for failures**

Accountability Framework: Additional EPA Expectations

- **Controls Needed**
 - States identify the controls needed (esp. NPS)
- **Current Capacity**
 - States identify current State/local capacity to implement (e.g., laws, regs, programs, funding)
- **Identify Gaps**
 - States identify “gaps” in current programs
- **Fill Gaps**
 - States commit “to work to systematically fill” gaps
 - Regulate more
 - Buy more (e.g., BMP cost-share)

EPA's Reasonable Assurance Assessment Tiers

Table 8-2. Thresholds for the four Phase I WIP evaluation tiers for the reasonable assurance assessment

	Tier 1. Met all expectations	Tier 2. Met most expectations	Tier 3: Met some expectations	Tier 4: Met few expectations
Threshold	Addresses all the major reasonable assurance categories identified in the November 4, 2009, letter and the April 2, 2010, WIP evaluation guide.	Identifies and provides reasons for current gap. Spells out numbers/percent of inspections and results. Schedule provided for potential actions. Evidence of or commitment to clear permit conditions. Contingencies in place for high risk/highly improbable actions. Proposals for attaining additional resources. Schedule to further flesh out details over time.	If any of the following occur: Does not address known, significant programmatic shortfalls and gaps. No discussion of compliance. No schedule for potential actions. Does not inform permit conditions. Proposals not feasible or do not address significant gaps. No commitment/schedule to develop details over time. Major discrepancies between type and extent of practices in WIP document and input deck.	If many of the following occur: Does not address known, significant programmatic shortfalls and gaps. No discussion of compliance. No schedule for potential actions. Does not inform permit conditions. Proposals not feasible or do not address significant gaps. No commitment/schedule to develop details over time. Major discrepancies between type and extent of practices in WIP document and input deck.

EPA's RA Assessment Outcome

- **No Jurisdiction Demonstrated RA to EPA's Satisfaction**
 - This is not going to be easy
- **Tier 2: Met Most expectations**
 - Maryland
 - D.C.
- **Tier 3: Met Some expectations**
 - VA was “moderately bad”
 - DE, NY, PA, WV were “seriously deficient” (“very bad”)

EPA's Primary Reasons

- **Gap-Filling Inadequate**
 - Lack of clear strategy for filling recognized staffing, funding, legislative authority, or regulatory gaps
- **Very few “enforceable or otherwise binding” commitments to achieve reductions**
 - From agriculture sector
 - From urban stormwater sector
- **Lack of Specific Details on Urban Stormwater**
 - State post-construction design standards
 - Requiring retrofits for existing development
 - Permit approaches (MS4, RDA)

“EPA Backstops”

(Translation: Federal Takeover)

- **Draft “Backstop” WLAs (Next Page)**
 - Sept. 2010 Draft TMDL includes “Backstop” WLAs
 - States must submit final WIPs Nov. 29, 2010
- **EPA-State Negotiations Underway**
 - States working to enhance their WIPs
 - Good possibility that “backstops” go away, for now...
- **But Huge Scope, Short Schedule Remains**
 - 2-Year Milestone compliance challenge
 - Good possibility that “backstops” will be back

EPA's "Backstop Allocations" in DRAFT TMDL Cut State WIP WLAs

State	TN (mg/L)	TP (mg/L)	Flow Basis
VA-York VA-James	4	0.3	Design
PA, NY, DE, WV	3	0.1	Design
Threatened Only	3	0.1	<i>2007-09 Actual</i>

The New Normal for TMDL Reasonable Assurance?

- **Inconsistent National Experience**

- “Over the course of approving or establishing more than 30,000 TMDLs, EPA has encountered a broad spectrum of acceptable reasonable assurance demonstrations.”
 - EPA Region III Administrator (Sept. 11, 2008)

- **Chesapeake Bay Direction**

- Intentionally at the “comprehensive end of the spectrum”

National Precedent or Special Case?

- **You can argue that the Chesapeake is a special case, not a precedent for your TMDL**
 - “Heightened expectations for this TMDL”
 - “Unprecedented amount of work” pre-TMDL
 - Knowledge re: implementation mechanisms that goes “far beyond” that usually available for TMDLs
 - “Therefore, expectations for the Bay TMDL are not applicable to the TMDL program in general”
 - *Letter from R3 Administrator dated Sept. 11, 2008*
- **But good luck with that ... I think we all know what many at EPA will really do**

QUESTIONS?

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