The Chesapeake Bay TMDL - A Driver for New Stormwater Strategies

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Presentation Overview

Chesapeake Bay Restoration

– Where We’ve Been
– Where We Are
– Where We’re Going
– How We’re Getting There
Chesapeake Bay Restoration

Where We’ve Been
• 1970’s studies identified **nutrients** as primary source of Bay degradation and loss of living resources (low DO)

• Current overall Bay Health Index = **C**
Multiple Jurisdictions – MD, VA, PA, DC, NY, DE, WV, Federal Lands
+ atmospheric deposition from numerous states

Watershed Conditions
Geographical Extent of Nutrient Loads from Land

All Sources of Total Nitrogen
Delivered Yield to the Chesapeake Bay

Delivered Nitrogen (kg/hec/yr)
- 0.0 - 1.5
- 1.6 - 3.0
- 3.1 - 4.5
- 4.6 - 6.0
- 6.1 - 7.5
- 7.6 - 9.0
- 9.1 - 10.5
- 10.6 - 12.0
- > 12.0

All Sources of Total Phosphorus
Delivered Yield to the Chesapeake Bay

Delivered Phosphorus (kg/hec/yr)
- 0.00 - 0.05
- 0.06 - 0.10
- 0.11 - 0.15
- 0.16 - 0.20
- 0.21 - 0.25
- 0.26 - 0.30
- 0.31 - 0.35
- 0.36 - 0.40
- > 0.40

Delivered yield (dry weight per area) is the amount of nutrient that is generated locally for each stream reach and weighted by the amount of stream loss that would occur with transport from the reach to Chesapeake Bay. The cumulative loss of nutrients from generation to delivery to the Bay is dependent on the transport and transformation rates of each individual reach. This map shows estimates based on mean conditions for the late 1980's time period.
• 1983 Chesapeake Bay Agreement
  – Formation of Executive Council (MD, VA, PA governors, DC mayor, EPA administrator & CBC Chair)

• 1987 Chesapeake Bay Agreement
  – Goal to reduce N&P 40% by Y2K

Chesapeake 2000 – Agreed to
  – Set WQ conditions to protect living resources
  – Establish specific nutrient load reductions
  – Establish Tributary Strategies to meet load reductions
  – Headwater states signed

Tributary Strategies - 2004
  – Each state established Tributary Strategies to achieve cap loads by 2010
Chesapeake Bay Restoration
Where We’ve Been – Progress Toward Voluntary Goals

Baywide - Total Annual Nitrogen Load
(CBP Watershed Model Phase 5.3, Jul-30-2010, with air)

Baywide - Total Annual Phosphorus Load
(CBP Watershed Model Phase 5.3, Jul-30-2010, with air)

Baywide - Total Annual Nitrogen Load
Annual Load (million lbs)

Baywide - Total Annual Phosphorus Load
Annual Load (million lbs)

1985  2002  2007  2009  2010 Goal (Trib Strat)
310  271  264  244  192

1985  2002  2007  2009  2010 Goal (Trib Strat)
24.1  18.5  17.8  16.5  14.4

310  271  264  244  192

24.1  18.5  17.8  16.5  14.4

Annual Load

2010 Goal (Trib Strat)
Progress
**Chesapeake Bay Restoration**

**Where We’ve Been - Program History**

- **1970s** Identification of the nutrient problem
- **1983 Ches Bay Agreement** - formed Executive Council
- **1987 Ches Bay Agreement** – 2010 40% nutrient reduction
- **1992 Amendment** – Outreach to u/s sources - NY, DE, WV
- **1994 MOU** 25 Federal agencies commit
c
- **Chesapeake 2000** - voluntary actions to meet 2010 goals.
- **2007 Executive Council** announce TMDL will be set
- **2008 Milestones** Exec Council commit to 2 yr milestones
- **2009 Executive Order** - Federal Leadership Committee
  - **May 2010** Final Federal Bay Policy
  - **July 2010** draft State and Basin allocations
  - **Sept - Nov 2010** Bay States Phase 1 Watershed Implementation Plans
  - **Sept 2010** draft TMDL(92 TMDLs)
- **December 2010** EPA Final Chesapeake Basin-wide TMDL
  - **Nov 2011** Ph 2 WIPs
  - **2011** TMDL Revision (?) & New CWA Rulemaking

**Timeline**

- **1970s** Bay degradation studied
- **1983** 1st Chesapeake Bay Agreement
- **1987** Goals set for 2000
- **1992** CBPO formed
- **1994** Commitment for two year milestones & accountability
- **2000** Commitment for new Federal policy
- **2007** TMDL will be needed
- **2008** States commitments to TMDL implementation
- **2010** Final TMDL
- **2011**+ Local Sub-Allocations
- **2011** New Regulatory Tools
Chesapeake Bay Restoration

Where We Are –

WIPPING up the TMDL
December 29, 2009 - EPA finalized new roadmap for accelerating restoration

- Evolved Sept 2008 – Dec 2009, core issues over NPS authority & definition of “reasonable assurance”

Restoration through framework based on:

1. The Chesapeake Bay TMDL
2. Executive Order - EO13508 Chesapeake Bay Restoration & Protection (Federal Leadership)
3. The authorities of the Clean Water Act

Source: EPA press release Dec 29, 2009 regarding completion of “the creation of a rigorous accountability framework for reducing pollution in the Chesapeake Bay” and referencing Sept 2008 & Nov 2009 letters to PSC.
TMDL to be finalized December 2010

- Load limits for N, P, Sediment
- Eight major basins, 92 jurisdictional sub-basins = 92 allocations, each including:
  - Waste Load Allocations (WLA)
  - Load Allocations (LA)
  - Margin of Safety

WLAs = point sources = WWTPs, IWTPs, MS4, industrial SW, construction outside MS4, CAFOs
LAs = NPS sectors = non-CAFO ag, unregulated SW, OSDS, forest

Source: Correspondence, EPA to PSC re: basinwide target loads and working jurisdiction basin target loads, Nov 3, 2009
Chesapeake Bay Restoration – WIPPING up the TMDL Accountability Framework

- Executive Order 13508 - Bay Restoration Strategy (May 2010)
  1. WIPs - *Watershed Implementation Plans* describing state actions
  2. Metrics - The jurisdictions must meet 2 year milestones for implementing pollution controls
  3. Consequences - EPA may impose a variety of consequences for inadequate plans or failure to meet the milestones

- State grants *to improve permitting, enforcement and other key regulatory activities*

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“….we’re increasing support and accountability to be sure we get the job done.”
---Lisa Jackson, Dec 29, 2009

Source: EPA press release Dec 29, 2009 regarding completion of “the creation of a rigorous accountability framework for reducing pollution in the Chesapeake Bay” and referencing Sept 2008 & Nov 2009 letters to PSC.
Accountability Framework - A New Era of Oversight

The Schedule

**WIP = State Watershed Implementation Plan**

**WIP & TMDL Schedule:**

- Phase 1 Draft WIPs Sept 1, 2010
- Draft TMDL Sept 24, 2010
- Phase 1 Final WIPs Nov 29, 2010
- Final TMDL Dec 31, 2010
- Phase 2 WIPs Nov 1, 2011
- Phase 3 WIPs Nov 1, 2017

- EPA establishes annual load targets for N, P, S for major basins & jurisdictions
- States divide targets into NPS sectors & point sources in each impaired segment
- States provide description of authorities, actions, and control measures
- EPA finalizes annual limits
Phase 2 WIPs (2011)
- Allocate LAs and WLAs to county scale
- Sub-allocation to watersheds, facilities or sources
- Detailed targets and schedule, tracking and reporting protocols
Where We Are – The Chesapeake Bay TMDL Draft (September 24) – To be finalized December 2010

Baywide - Total Annual Nitrogen Loads Progress to Date Compared to Goals
(CBP Watershed Model Phase 5.3, Jul-30-2010, excluding air)
Baywide - Total Annual Phosphorus Loads
Progress to Date Compared to Goals

(CBP Watershed Model Phase 5.3, Jul-30-2010)

Where We Are – The Chesapeake Bay TMDL Draft (September 24) – To be finalized December 2010
Maryland - Total Annual Nitrogen Loads
Progress to Date Compared to Goals
(CBP Watershed Model Phase 5.3, Jul-30-2010)

- Annual Load
- Goal
- Progress

Achieve TMDL in 2020

2017 MDE 70% Milestone
2025 Draft TMDL Allocation (Sept-10)
Where We’ve Been
Maryland – By Sector

Maryland - Total Annual Nitrogen Load
Progress Per Sector
(CBP Watershed Model Phase 5.3, Jul-30-2010)

Achieve TMDL in 2020

- Agriculture
- Urban runoff
- Point sources
- Septic

TMDL

0 5 10 15 20 25 30 35
Chesapeake Bay Restoration
Where We’re Going
Where We’re Going
Maryland – By Sector

Maryland - Total Annual Nitrogen Load Progress Per Sector
(CBP Watershed Model Phase 5.3, Jul-30-2010)

Achieve TMDL in 2020

- Agriculture
- Urban runoff
- Point sources
- Septic
Where We’re Going
Maryland - Stormwater

Maryland - Total Annual Nitrogen Load Progress - Urban Runoff
(CBP Watershed Model Phase 5.3, Jul-30-2010)
Where We’re Going
Maryland - Stormwater

Maryland - Total Annual Phosphorus Load Progress - Urban Runoff
(CBP Watershed Model Phase 5.3, Jul-30-2010)
Chesapeake Bay Restoration
How We’re Getting There
Urban Stormwater Hydrology

• Most of the pollutants in stormwater runoff come from small and moderate size storms

• Smaller storms are much more frequent and account for majority of runoff
December 29, 2009 - EPA finalized new roadmap for accelerating restoration

- Evolved Sept 2008 – Dec 2009, core issues over NPS authority & definition of “reasonable assurance”

Restoration through framework based on:

1. The Chesapeake Bay TMDL
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Source: EPA press release Dec 29, 2009 regarding completion of “the creation of a rigorous accountability framework for reducing pollution in the Chesapeake Bay” and referencing Sept 2008 & Nov 2009 letters to PSC.
Accountability Framework - A New Era of Oversight
Clean Water Act Authorities

Proposed Rulemaking Oct 26, 2009
Post-Construction Stormwater Management

- Expand NPDES program
- Establish SWM standards
- Align the program with 2008 NRC recommendations

**KEY NRC Report Recommendations**

“A straightforward way to regulate stormwater contributions to waterbody impairment would be to use flow or a surrogate like impervious cover, as a measure of stormwater loading."

“Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading. Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality.”

“Stormwater control measures that harvest, infiltrate, and evaporate stormwater are critical to reducing the volume and pollutant loading of small storms.”
Accountability Framework - A New Era of Oversight
Clean Water Act Authorities

Proposed Rulemaking: Oct 26, 2009
Post-Construction Stormwater Management
Current Considerations

Expand permitting beyond urban
- Expand to developing areas
- County or other jurisdictional boundaries?
- Criteria to define permit area: % impervious?
- Cover specific types or sizes of development?

Post-construction SWM stds
- Mimic natural infiltration, recharge, evapotranspiration, harvest & reuse
- Considering storm size stds, imperv limits, site by site, regional criteria
- Same for new vs redevelopment?

Uniform requirements for all MS4s
- To replace Phase I & II
- Apply Phase I inspection, monitoring, other to all
- Apply 6 Minimum Control Measures to all
- Require all to control industrial discharges

Retrofit existing development
- Require retrofit in all MS4s?
- Require retrofit plans
- Require plan implementation
- Start with large MS4s?
- Limit to WQ impaired waters?

Chesapeake Bay addn’l requirements
- Additional rules for active construction
- Buffer requirements
- Further extend area of coverage
- May apply Chesapeake Bay rules to other sensitive areas of US

Expand Authority
Reduce Runoff
Residual Designation
Retrofit

Accountability Framework
Bay TMDL
Executive Order 13508
CWA Authorities
### Accountability Framework - A New Era of Oversight

**Proposed Rulemaking: Oct 26, 2009**

**Post-Construction Stormwater Management Current Considerations**

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<th>Expand permitting beyond urban</th>
<th>Post-construction SWM stds</th>
<th>Uniform requirements for all MS4s</th>
<th>Retrofit existing development</th>
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<td>B. Residual Designations (new permits)</td>
<td>C. Permit Inspection and Enforcement</td>
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<tr>
<td>• Post-Construction Standards</td>
<td>• Federal Facilities: EISA 438</td>
<td>• Permit inspection enforcement to all</td>
<td>• Require retrofit in all MS4s?</td>
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<td>• Accountability</td>
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**Chesapeake Bay addn’l requirements**

- Additional rules for active construction
- Buffer requirements
- Further extend area of coverage
- May apply Chesapeake Bay rules to other sensitive areas of US

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**Initiated October 8, 2010**
• Improve national WQ compliance & enforcement program:
  – **Target enforcement to most important problems**
    • stormwater (urban streets & construction sites)
    • CSOs & sanitary sewer overflows
    • CAFOs
  – **Strengthen oversight of the states**
    • Ensure that states protect WQ and consistently apply the law through permits & vigorous enforcement
    • EPA to disapprove permits & pursue federal enforcement if states too lenient
  – **Improve transparency and accountability**
    • Electronic reporting & make data available to the public
Key elements of the Strategy include:

- Identify significant dischargers of industrial, municipal, agricultural pollutants in
- Identify nutrient & sediment impaired watersheds
- Target key regulated non-compliant business sectors”
  - CAFOs
  - WWTPs and IWTPs
  - Stormwater NPDES point sources including MS4s, construction & industrial
  - Air deposition sources of nitrogen regulated under CAA, including power plants
- Identify compliance and enforcement opportunities
WIP “Actions” to reduce nutrient & sediment include:

- Increased stormwater control
- Expansion of permit coverage
- Increased requirements in revised MS4 permits
- Enforcement
- New offset and trading programs (nutrients & ecosystem)

WIP “Contingencies” - WIPs will describe measures to be taken if progress is not achieved, such as:

- State-imposed impervious fees
- Require conversion of non-performing OSDS to public sewer
- Development offset requirements
- Restrictions on new permits
The jurisdictions (States) must meet 2-year milestones

EPA may impose a variety of consequences for inadequate plans or failure to meet the milestones, including:

1. Expand coverage of NPDES permits to sources that are currently unregulated
2. Increasing oversight of state-issued NPDES permits, e.g., object to permits
3. Require net improvement offsets

Residual Designation. The CWA recognizes that sources such as commercial properties may need to be regulated on a case-by-case basis.

Source: Correspondence, EPA to PSC re: Consequences, Dec 29, 2009
EPA consequences, continued:

4. Establish finer scale WLAs and LA’s in the Bay TMDL than those proposed in the WIPs, e.g., to MS4s

5. Require additional reductions from point sources, e.g., **reallocate NPS reductions to point sources such as WWTPs & CAFOs**

6. Increase and target federal enforcement and compliance – air & water

7. Condition or redirect EPA grants

8. **Federal promulgation of local nutrient WQ standards** where states not protective of designated uses

Source: Correspondence, EPA to PSC re: Consequences, Dec 29, 2009
Implications and Strategies
Implications

Emphasis on Runoff Control

1. New regulations
2. Onsite control of frequent storm events
3. Water quality retrofit programs
4. Performance requirements tied to permits
5. Accountability through annual reporting
6. Nutrient and sediment reduction
7. New design, construction and operational standards
8. New growth and redevelopment challenges
9. Market based incentives
10. More $$$ investment – stormwater utilities, increased public awareness
1. NPDES permit compliance
2. Plan capital improvement & funding needs
3. Plan organizational & program needs
4. Prepare development planning & offset strategies to restore or maintain water quality
5. Monitor (participate in) state technical assessments & sub-allocation discussions
6. Strengthen database and reporting of current SWM practices
7. Strengthen BMP effectiveness data (monitoring)
8. Keep excellent records (credit “confidence level”, NPDES compliance, unknowns, etc)
9. Educate
Thank You

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Chesapeake Bay Restoration
Where We’ve Been – Progress Toward Voluntary Goals

• Current (2009) Load by Jurisdiction (million lbs/year)

- Total Annual Nitrogen Loads by Jurisdiction - 2009
- Total Annual Phosphorus Loads by Jurisdiction - 2009
- Total Annual Sediment Loads by Jurisdiction - 2009
Watershed Conditions
Relative Contribution from Drainage Basins

- Susquehanna
- Potomac
- James
- Patapsco
- Back River
- Lower Eastern Shore
- Upper Eastern Shore
- Lower Western Shore
- Patuxent River
- York River
- Elizabeth River
- Upper Eastern Shore
- Choptank River
- Lower Eastern Shore

http://www.eco-check.org/reportcard/chesapeake/2008/overview/#_Background