Lessons Learned in Restoring Chesapeake Bay WQ

Putting the 17 Million Chesapeake Bay Watershed Residents on a Regulatory Pollution Diet

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U.S. EPA Region 3
Chesapeake Bay Program Office

NCER 2011 August 2, 2011
Get Full Buy-in on What Defines Restored Water Quality

**Sunlight**
- Minimal Nitrogen, Phosphorus and Sediment Inputs
- Balanced Algae Growth
- Healthy Bay Grasses
- Healthy Oyster Reef
- Adequate Oxygen
- Healthy Habitat

**Excessive Nitrogen, Phosphorus and Sediment Inputs**
- Algal Bloom
- Reduced Bay Grasses
- Algae Decomposition
- No Oxygen
- Unhealthy Habitat

**Algae Die-off**
- Barren Oyster Reef
- No Benthic Community
Rethink ‘Fishable/Swimmable’ in Terms the Public Can Relate to

Local “Zoning” for Bay and Tidal River Fish, Crab and Grasses Habitats
Use Best Available Science to Quantify WQ Conditions Protective of Uses

Bay Dissolved Oxygen Criteria

Migratory Fish Spawning & Nursery Areas
- Striped Bass: 5-6
- American Shad: 5

Shallow and Open Water Areas
- White Perch: 5
- Yellow Perch: 5
- Hard Clams: 5

Deep Water
- Crabs: 3
- Alewife: 3.6

Deep Channel
- Spot: 2
- Bay Anchovy: 3

Worms: 1

Use Best Available Science to Quantify WQ Conditions Protective of Uses
Connect Water Quality Impairments with Upland (and Upwind) Sources
Do What is Needed to Reach Agreement on Equitable Distribution of Responsibility
Address All Pollutant Sources Equitably

**Sources of Nitrogen to the Bay**

- Agriculture-Manure (17%)
- Agriculture-Chemical Fertilizer (15%)
- Septic Systems (4%)
- Developed Lands-Chemical Fertilizer (10%)
- Municipal and Industrial Wastewater (19%)
- Atmospheric Deposition-Mobile, Utilities and Industries (19%)
- Atmospheric Deposition-Natural (1%)
- Atmospheric Deposition to Tidal Waters (7%)
Build/Maintain Long Term Monitoring Networks
Apply a Suite of Models and Tools to Connect Sources-Management Actions-WQ Responses

1. Chesapeake Bay Airshed Model
2. Chesapeake Bay Land Change Model
3. Chesapeake Bay Watershed Model
4. Chesapeake Bay Water Quality and Sediment Transport Model
5. Chesapeake Bay Filter Feeder Model
6. Chesapeake Bay Scenario Builder

Parameters
- BMP type and location
- Land use
- Remote Sensing, NASS Crop land Data layer
- Crop acres
- Yield
- Animal Numbers (Ag Census or state supplied)
- Land applied biosolids
- Septic system (Is)

Inputs
- BMP types and efficiencies
- Land use change (BMPs, others)
- RUSLE 2 Data: % leaf area and residue cover
- Plant and harvest dates
- Best potential yield
- Animal factors (height, phytase feed, manure amount and composition)
- Crop application rates and timing
- Plant nutrient uptake
- Time in pasture
- Storage loss
- Nitritification
- Animal manure to crops
- N fixation
- Septic delivery factors

Outputs
- BMPs, # and location
- Land use
- % Bare soil, available to erode
- Nutrient uptake
- Manure and chemical fertilizer (lb/segment)
- N fixation (lb/segment)
- Septic loads
Reach Agreement with Partners/Stakeholders on an Equitable Allocation Methodology
Assign Pollutant Load Responsibility Closest to the Actual Source as Possible

Table B2. Format for Submitting Phase I Watershed Implementation Plan Outputs

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Note: Land areas do not reflect the actual area draining into a segment with 100% accuracy but are basically correct at the map scale.
Go as Local with Your Allocations as Your Scientific Understanding Enables You to

Virginia Bay TMDL Segmentsheds
Put in Place an Institutional Structure Which Provides a Seat at the Table for Many

**Citizens’ Advisory Committee**
Chair - Jim Elliot
Hunton & Williams LLP

**Local Government Advisory Committee**
Chair – Mary Ann Lisanti
Harford County

**Scientific & Technical Advisory Committee**
Chair – Denise Wardrop
PSU

**Chesapeake Executive Council**
Chair – Lisa Jackson, EPA

**Principals’ Staff Committee**
Chair – Shawn Garvin, EPA

**Management Board**
Acting Chair
Jim Edward, EPA

**Communications Workgroup**
Chair--Courantz, NOAA
Vice-- Waugh, VaDCR

**Goal Implementation Teams**

- **Sustainable Fisheries**
  Chair Robertson
  NOAA
  O’Connell
  MdDNR
  Vogt
  NOAA
  Davis
  CRC
  Implementation Workgroups

- **Protect & Restore Vital Habitats**
  Chair Miranda
  USFWS
  Horan
  MdDNR
  Greiner
  USFWS
  Hession
  CRC
  Implementation Workgroups

- **Protect & Restore Water Quality**
  Chair Korancai (co-chair)
  EPA
  Hansen (co-chair)
  UDel
  Antos
  EPA
  Streusand/Kilbert
  CRC
  Implementation Workgroups

- **Maintain Healthy Watersheds**
  Chair Bryer
  NGO(TNC)
  Hall
  MdDP
  Fritz
  EPA
  Burnett
  CRC
  Implementation Workgroups

- **Foster Chesapeake Stewardship**
  Chair Maounis
  NPS
  Barrett
  PaDCHR
  Handen
  NPS
  Brzezinski
  CRC
  Implementation Workgroups

- **Enhance Partnering, Leadership**
  Chair Foreman
  VaDCR
  Bisland
  EPA
  Allen
  EPA
  Harris
  CRC
  Implementation Workgroups

**Action Teams**

- **Independent Evaluator**
  Chair – Horan, MdDNR
  EC/FLC Alignment
  Chair – Bisland, EPA
  ChesapeakeStat/Adptv. Mgt.
  Co-Chair – Stewart, MdDNR
  Co-Chair – Muller, USNA

**Science, Technical Analysis, and Reporting**

- **Dennison**
  UMD
  Bennett
  USGS
  Tango
  USGS
  Barnes/Gorka
  CRC
Build in Adaptation From the Start

Major basin jurisdiction loading targets

Oct 2009

Bay TMDL Public Meetings

November-December 2009

Draft Phase I Watershed Implementation Plans: November 2009 – Sept. 1 2010

Local Program Capacity/Gap Evaluation

July 1 and August 13 Allocations

Draft TMDL Sept. 24, 2010 (45 days)

Public Review And Comment

November-December 2010

Final TMDL Established

December 2010

Provide Local Planning Targets for smaller Watersheds, Counties, Sources

Starting 2011

Phase II Watershed Implementation Plans: Starting 2011

Final WIPs

2-year milestones, reporting, modeling, monitoring

2017 60% of Practices in Place - Phase III WIPs to meet 2025 Goal
Build and Institutionalize an Accountability System

Watershed Implementation Plans identify nutrient and sediment targets that meet water quality standards. Plans include:

Evaluation of Program Capacity necessary to fully restore water quality

Federal Actions
if insufficient Watershed Implementation Plans or 2-year milestones are not met

Chesapeake Bay TMDL: Set Pollution Reduction Goals for Point and Non-point Sources to Meet Bay Water Quality Standards

Model and Monitor to assess progress

2-Year Milestones with program enhancements and nutrient and sediment reduction commitments

Identification of Gaps between needed and existing program capacity

Schedule and Strategies to enhance programs and reduce nutrients and sediment

Schedule and Strategies to enhance programs and reduce nutrients and sediment
Recognize
There is a Need for Basic Behavior Changes and Act on this Need

“Well, Timmy, it looks like you’ve just earned yourself 10 minutes in the cage with Mr. Whiskers.”
Never, Ever Forget
Who You Need to
Work with and Who
You are Really
Working For

Pollutant Loads in the Chesapeake
— It's All in the Stakeholder Process

Knee Capping
Protecting Public Participation

Warming Trends
Strict Implementation of Existing Statutes?

EPA HAPs Rule
Standards Would Place Strict Limits
Questions