

Chesapeake Bay TMDL Update

Presentation to the Water Resources Technical Committee

May 13, 2010



Overview

- Bay TMDL Schedule and Process
- Moving Toward Final 2010 Nutrient and Sediment Targets
- EPA Settlement with CBF

Principals' Staff Committee

April 29 – 30, 2010

- EPA reaffirmed the federal – state commitment to establish the Chesapeake Bay TMDL(s) by December 31, 2010
- EPA views the TMDL(s) as a tool to ensure that a “pollution diet” for the Bay and actions to meet it stay on an aggressive pace.

Steps in the TMDL process

Step 1 – Develop TMDL by December 2010

- Allocate loads
- Develop Phase I WIPS
- Establish Bay TMDL

Step 2 – 2011

- EPA revises watershed model
- States and the District submit Phase II WIPs

Step 3 – 2017

- States and the District submit Phase III WIPs
- EPA modifies TMDL (if necessary)



Step 1 – getting to December 2010

July 1 – EPA divides overall “pollution diet” for nitrogen and phosphorus among the states and District of Columbia.

August 15 – Sediment loads by state/basin determined

September 1 – States and the District complete draft Phase I Watershed Implementation Plans (WIPs).

TBA – Draft Bay TMDL developed and offered for public comment.

November 29 – States and the District complete final Phase I WIPs - and how Growth is to be addressed.

December 31 – EPA establishes the Bay TMDL

Step 2 - 2011

EPA Revises watershed model with results of two model updates

- Nutrient management effectiveness
- Suburban land characteristics
- EPA removes or reduces “safety factor”

States and the District submit Phase II WIPs

- Draft by June 1, 2011
- Final by November 1, 2011
- Plans reflect model updates and finer scale management actions

By November 1, 2011 states and the District submit for 30-day comment period, any intention to modify their TMDL allocations.

Step 3 - 2017

In advance, EPA reviews models and decides whether additional updates are needed

In 2017

- States and the District submit Phase III WIPs – November 1, 2017
- Focus in Phase III WIPs is ensuring management actions will be in place by 2025 to achieve Bay water quality standards
- By December 31, 2017, EPA modifies Bay TMDL(s), if necessary:
 - To increase/decrease loads
 - To reallocate between WLA's and LA's (e.g., more to WWTPs/SW)
 - And determines if state WIPs need to change as a result

Recap of Schedule Changes

About one year ago...

Jurisdictions agree to allocations by October 2009

Draft WIPs due – January 1, 2010

May 2010 – TMDL out for public comment

Comment period – June through September

December 31 – EPA establishes the Bay TMDL

Now

Jurisdictions agree to allocations by July 1, 2010

Draft WIPs due – September 1, 2010

TBA – TMDL out for public comment

Comment period – 30 days

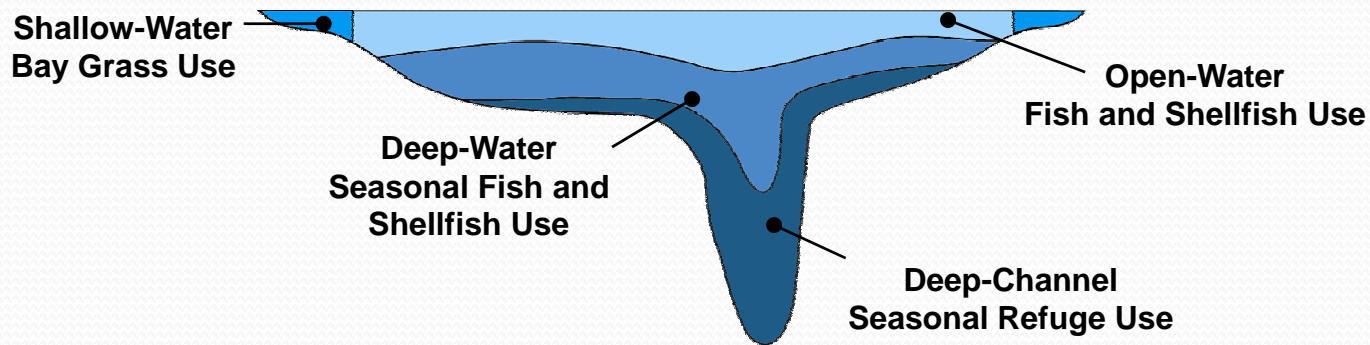
December 31 – EPA establishes the Bay TMDL

Moving Toward Final 2010 Nutrient and Sediment Loads



Refined Designated Uses for Chesapeake Bay and Tidal Tributary Waters

A. Cross Section of Chesapeake Bay or Tidal Tributary



B. Oblique View of the “Chesapeake Bay” and its Tidal Tributaries

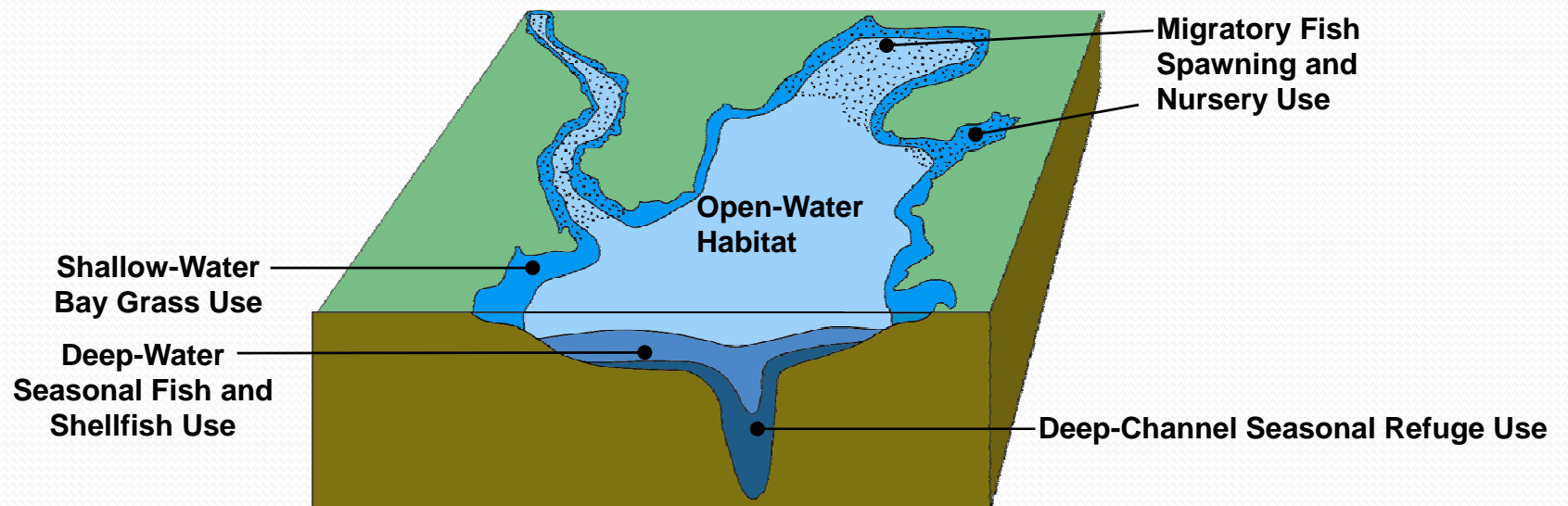
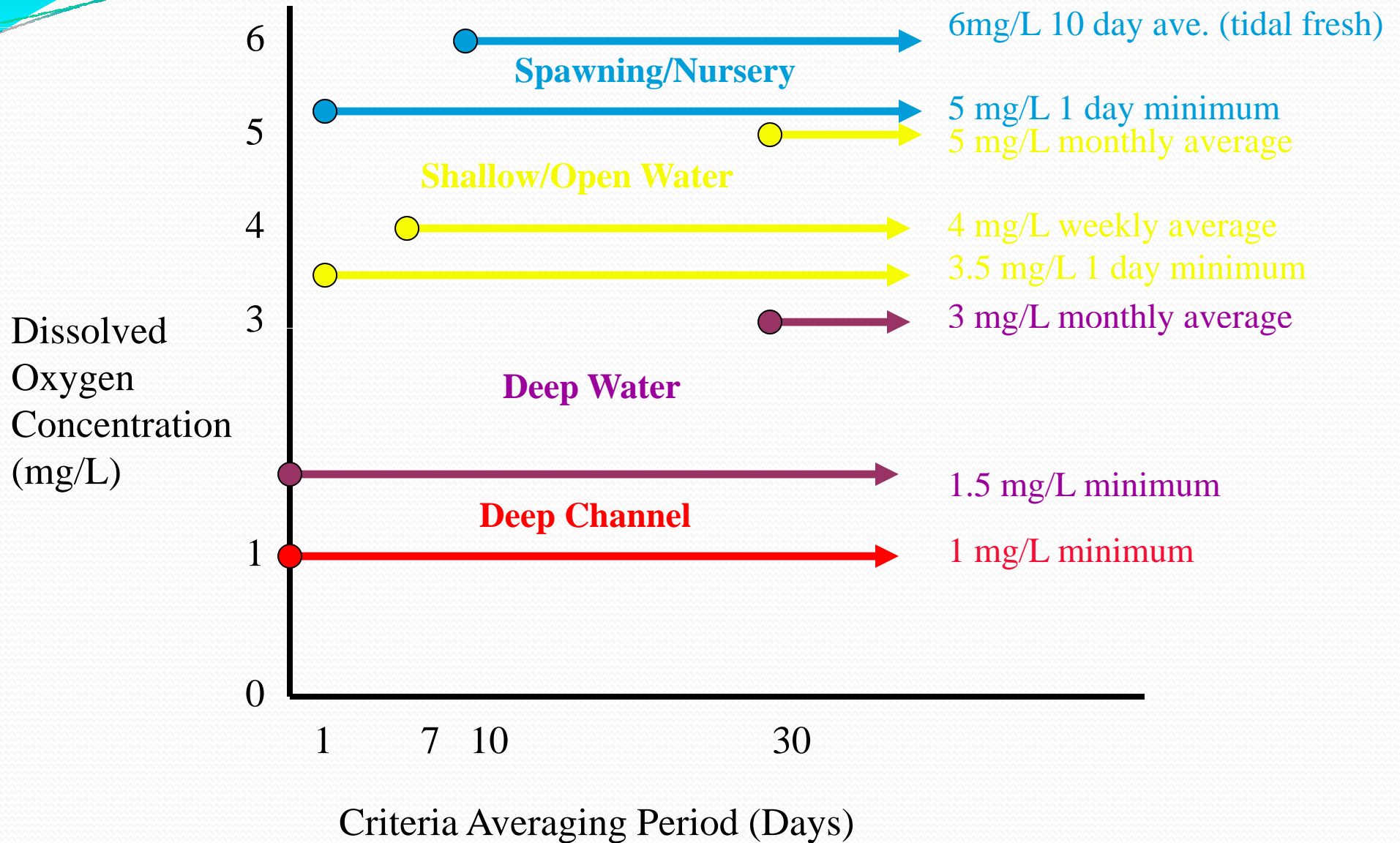


Illustration of Chesapeake Bay Dissolved Oxygen Criteria





A few key points

The Bay Program is developing new information every week, so these results are likely to change.

We need to achieve all water quality standards in the Chesapeake Bay and tidal tributaries.

In general, nutrient reductions needed to attain WQS are consistent with the 2003 nutrient allocation:

- Deep Water and Deep Channel designated use attainment will require global reductions.
- Open Water, Chlorophyll, and Clarity designated uses respond more to local reductions.
- A limited number of the 92 TMDL segments will need to go beyond E₃
- E₃ Scenario assumes maximum technically feasible with no aspect of cost feasibility and limited notions of 'implementation' feasibility. Critical for point sources.

Loads of the coupled Phase 5.3 and WQSTM by basin

Total Nitrogen Loads by Basin (millions of pounds/year)

Basins	1985 Scenario 342TN, 24.1TP	Base Case Scenario 309TN, 19.5TP	2007 Scenario 254TN, 17.1TP	Target Load Scenario A 200TN, 15.0TP	Target Load Scenario B 195TN, 14.3TP	Tributary Strategy 191TN, 14.4TP	Loading Scenario 186TN, 10.9TP	E3 Scenario 141TN, 8.5TP
Susquehanna	146.4	135.9	115.0	85.9	83.3	81.9	76.5	65.3
Western Shore	27.0	17.8	14.4	9.8	9.7	9.9	13.0	5.6
Patuxent	4.2	3.9	3.1	2.9	2.9	2.8	2.5	1.9
Potomac	81.3	75.5	55.5	46.9	45.8	43.8	43.2	33.4
Rappahannock	8.9	8.4	7.5	6.2	5.9	5.6	5.3	4.5
York	7.6	7.4	6.9	5.6	5.5	5.1	5.3	3.8
James	42.6	36.8	31.4	27.1	26.9	27.5	26.6	16.1
Eastern Shore	23.9	23.9	20.4	15.5	14.6	14.3	14.0	10.6
Total	341.8	309.4	254.2	200.0	194.6	190.9	186.4	141.2

Loads of the coupled Phase 5.3 and WQSTM by basin

Total Phosphorus Loads by Basin (millions of pounds/year)

Basins	1985 Scenario 342TN, 24.1TP	Base Case Scenario 309TN, 19.5TP	2007 Scenario 254TN, 17.1TP	Target Load Scenario A 200TN, 15.0TP	Target Load Scenario B 195TN, 14.3TP	Tributary Strategy 191TN, 14.4TP	Loading Scenario 186TN, 10.9TP	E3 Scenario 141TN, 8.5TP
Susquehanna	5.64	4.84	4.20	3.36	3.32	3.36	2.26	2.22
Western Shore	1.62	0.87	0.80	0.54	0.55	0.68	0.47	0.23
Patuxent	0.48	0.36	0.33	0.25	0.25	0.29	0.24	0.12
Potomac	5.21	4.90	4.49	4.10	4.01	3.76	2.83	2.33
Rappahannock	1.30	1.24	1.17	1.13	0.92	0.94	0.77	0.61
York	1.03	0.76	0.70	0.64	0.58	0.59	0.48	0.34
James	6.51	4.34	3.56	3.05	2.92	3.29	2.49	1.50
Eastern Shore	2.36	2.23	1.85	1.92	1.78	1.45	1.43	1.14
Total	24.14	19.54	17.11	15.00	14.32	14.36	10.98	8.49

Loads of the coupled Phase 5.3 and WQSTM by basin

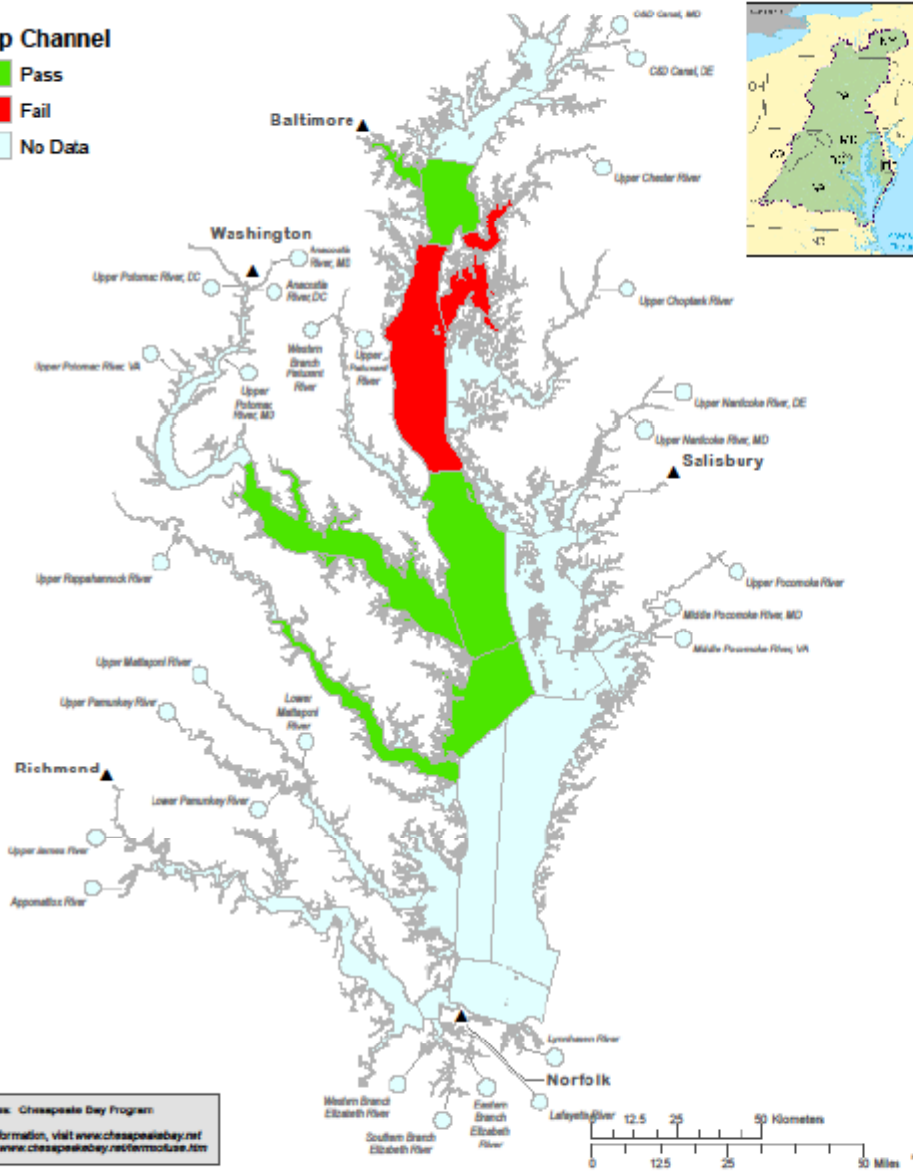
Sediment (TSS) Loads by Basin (millions of pounds/year)

Basins	1985 Scenario 342TN, 24.1TP	Base Case Scenario 309TN, 19.5TP	2007 Scenario 254TN, 17.1TP	Target Load Scenario A 200TN, 15.0TP	Target Load Scenario B 195TN, 14.3TP	Tributary Strategy 191TN, 14.4TP	Loading Scenario 186TN, 10.9TP	E3 Scenario 141TN, 8.5TP
Susquehanna	3,187	2,820	1,183	1,459	1,462	2,130	706	1,829
Western Shore	314	268	253	182	185	206	163	99
Patuxent	190	171	131	104	105	104	101	60
Potomac	3,009	2,788	2,444	2,265	2,217	1,956	2,132	1,464
Rappahannock	888	841	761	752	700	688	1,064	629
York	213	180	167	153	137	114	115	82
James	1,587	1,502	1,297	1,155	1,108	1,022	1,002	713
Eastern Shore	399	378	316	330	295	242	228	182
Total	9,786	8,947	6,552	6,399	6,210	6,462	5,510	5,058

Attainment Status, Draft Target Load Scenario (200 TN, 15TP)
Critical Period 1993-1995



Deep Channel
Pass
Fail
No Data



Data Sources: Chesapeake Bay Program
For more information, visit www.chesapeakebay.net
Disclaimer: www.chesapeakebay.net/termsuse.htm

Created by HW, 4/27/10

UTM Zone 18N, NAD 83

Deep-Channel Use Dissolved Oxygen at Current Target Loads (200 TN, 15 TP+ 15.7 air allocation)

- Non-attainment in 3 segments (>1%)
 - CB4 (2%)
 - Lower Chester (14%)
 - Eastern Bay (4%)
- Reaching attainment will require further reductions in nutrient loads from larger Bay watershed



An Estimate of the Open Water DO Response

- There are 14 CB segments of Open Water DO nonattainment (>1%) in the Target Load Option A Scenario.
- This decreases to 12 non-attaining Open Water segments in the Tributary Strategy.
- At E3 there are 8 segments of Open Water DO that are in nonattainment. These problem segments may be due to assessment limitations and we'll report what we find next week.

Cbseg	1985 Scenario 342TN, 24.1TP, 9790TSS '93-'95 DO Open Water Summer Monthly	'91-'00 Base Scenario 309TN, 19.5TP, 8950TSS '93-'95 DO Open Water Summer Monthly	2007 Scenario 254TN, 17.1TP, 6498TSS '93-'95 DO Open Water Summer Monthly	Target Load Option A 200TN, 15TP, 6390TSS '93-'95 DO Open Water Summer Monthly	Target Load Option B 195TN, 14.3TP, 6255TSS '93-'95 DO Open Water Summer Monthly	Tributary Strategy 191TN 14.4TP, 6462 TSS '93-'95 DO Open Water Summer Monthly	Loading Scenario 190TN 13.4TP, 5913TSS '93-'95 DO Open Water Summer Monthly	Loading Scenario 186TN 10.9TP, 5510TSS '93-'95 DO Open Water Summer Monthly	E3 2010 Scenario 141TN 8.5TP, 5060TSS '93-'95 DO Open Water Summer Monthly
APPTF	0.0%	0.0%	4.7%	4.6%	4.6%	4.6%	0.0%	0.0%	0.0%
BACOH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BIGMH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
BOHOH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%
BSHOH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB1TF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB2OH	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB3MH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB4MH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB5MH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB6PH	4.5%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CB7PH	8.8%	7.0%	2.2%	0.5%	0.5%	0.3%	0.1%	0.1%	0.0%
CB8PH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHKOH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOMH1	3.1%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOMH2	15.6%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOOH	16.7%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHOTF	18.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSMH	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSOH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CHSTF	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.5%	0.0%	0.0%
CNDOH	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CRRMH	39.9%	24.5%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%
DCATF	37.6%	27.5%	22.2%	13.7%	12.4%	1.2%	5.4%	0.3%	0.0%
DCPTF	10.1%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DENTF	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EASMH	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EBEMH	22.7%	22.7%	21.5%	4.7%	4.7%	0.0%	4.7%	3.0%	0.0%
ELIPH	3.6%	4.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



Critical Elements for Assessing the Clarity/SAV Water Quality Standard:

- SAV acres.
- Clarity acres.
- Percent light through the water ($PLW = e^{-ke \cdot z} * 100\%$)
- Application depth.
- When the standard is in effect, or the SAV growing season for three key oligohaline, mesohaline, and polyhaline SAV communities.



Keep in Mind That:

- This is the first time ever application and assessment of the SAV/clarity water quality standard in the Chesapeake in contrast to a three decade application of DO criteria and standards.
- Our sense is that we still have a lot to learn in the shallow water SAV habitat. Fortunately, we have ongoing two year assessments of this standard between now and 2025 and ultimately we assess attainment with monitoring data/observations.
- With data correction of the clarity data we believe we can make our first assessment of what's needed to achieve the SAV-clarity water quality standard.
- From the base of this first clarity assessment we'll be able to grow the science and our understanding of the shallow water habitat as we go forward.

Potomac River Clarity and SAV assessment

- Potomac mesohaline and oligohaline segments are meeting the respective clarity standards.
- Some Potomac tidal fresh segments are not meeting the clarity standard, but existing SAV acres should result in attainment.

CB SEG.	State	91-'00	2007	Target		91-'00	2007	Target		91-'00	2007	Target
		Base '91-93	Scenario '91-93	Load '91-93		Base 92-43	Scenario 92-43	Load 92-43		Base 93-95	Scenario 93-95	Load 93-95
POMMH	MD	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%		0.00%	0.00%	0.00%
POVMH	VA	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%		0.00%	0.00%	0.00%
PO1OH	MD	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%		0.00%	0.00%	0.00%
PO2OH	MD	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%		0.00%	0.00%	0.00%
PO3OH	MD	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%		0.00%	0.00%	0.00%
POVOH	VA	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%		0.00%	0.00%	0.00%
DCPTF	DC	54.04%	35.12%	28.38%		54.04%	31.70%	26.25%		42.12%	30.13%	21.76%
MDPTF	MD	66.43%	54.94%	42.54%		70.72%	52.70%	40.24%		71.27%	50.64%	40.24%
POVTF	VA	22.34%	0.00%	0.00%		22.34%	0.00%	0.00%		24.17%	1.68%	0.00%



Again, of the Phase 5.3 Scenarios Run So Far On the WQSTM the Phase 5.1 and 5.3 Calibration Results Look Much the Same For James Chlorophyll

Spring Chlorophyll Response

Cbseg	Scenario→	P51	P53	2007 (P53)	Target Load (P53)	P51	P53	2007 (P53)	Target Load (P53)	P51	P53	2007 (P53)	Target Load (P53)
	Year →	'91-'93	'91-'93	'91-'93	'91-'93	'92-'94	'92-'94	'92-'94	'92-'94	'93-'95	'93-'95	'93-'95	'93-'95
	State	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal	CL Spring Seasonal
DCATF	DC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DCPTF	DC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
JMSTFL	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.0%	5.6%	5.7%	3.7%
JMSTFU	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSOH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSMH	VA	29.6%	29.6%	19.5%	2.1%	5.3%	5.3%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSPH	VA	21.8%	19.8%	0.9%	0.0%	0.0%	5.4%	0.9%	0.0%	0.0%	5.4%	0.9%	0.0%

Summer Chlorophyll Response

Cbseg	Scenario→	P51	P53	2007 (P53)	Target Load (P53)	P51	P53	2007 (P53)	Target Load (P53)	P51	P53	2007 (P53)	Target Load (P53)
	Year →	'91-'93	'91-'93	'91-'93	'91-'93	'92-'94	'92-'94	'92-'94	'92-'94	'93-'95	'93-'95	'93-'95	'93-'95
	State	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal	CL Summer Seasonal
DCATF	DC	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
DCPTF	DC	9.3%	9.3%	2.8%	0.0%	9.3%	9.3%	2.8%	21.8%	33.6%	33.6%	27.1%	46.1%
JMSTFL	VA	35.6%	35.1%	0.0%	0.0%	36.4%	36.2%	0.0%	0.0%	28.6%	20.2%	0.0%	0.0%
JMSTFU	VA	22.2%	22.3%	10.3%	6.3%	21.7%	21.7%	7.5%	5.3%	17.1%	17.1%	7.5%	5.3%
JMSOH	VA	3.3%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	0.0%
JMSMH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
JMSPH	VA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	0.0%



Follow-up Actions:

- Look at current monitoring assessments of clarity to examine consistency with model assessments of recent years such as 2005, 2010 and other recent years.
- Generally tighten up assessment approach.
- Examine the sensitivity of the WQSTM simulation in the shallow water and make adjustments if warranted.
- Examine reasons for persistent nonattainment in some designated uses.

CBF-EPA Settlement Preliminary Summary



Settlement Timetable

January 2009 – CBF and partners sue EPA (*Fowler vs. United States of America*)

- Plaintiffs include watermen's associations in MD and VA and four prominent former elected officials
- September 2009 – MAMWA, VAMWA, SWAM and VAMSA successfully petition for intervenor status

January 2010 – April 2010 – settlement discussions with EPA; suit on hold

May 10, 2010 – settlement signed



Settlement Details

By Dec.31, 2010, EPA will issue 92 Bay TMDLs

- Settlement includes a number of details consistent with EPA's development of TMDL to date, e.g. including allocations for new or increased permitted discharges or a provision that any such loads be appropriately offset

Every two years, EPA will review state WIP progress and milestone achievement

- EPA will take “appropriate action” to ensure that the states are making satisfactory WIP progress and achieving their milestones

May 2011 – EPA will announce two-year milestones for federal agency actions

Settlement Details

By Dec. 31, 2017, EPA will review NPDES permits, including:

- Significant WWTPs
- Proposed construction general permits

EPA will issue a “MS4 Stormwater Permitting Approach for the Chesapeake Bay Watershed” that will identify its performance expectations

- Review all new construction general permits drafted by Bay states and make sure they meet federal standards;
- By July 31, 2010 develop a guidance for major municipal stormwater permits in the Bay region; and
- By Nov. 19, 2012, take final action on industrial and municipal stormwater regulations.

By June 1, 2010, EPA will take final action on the NPDES permit for Blue Plains
- Currently, no changes from draft permit are anticipated

EPA will monitor compliance schedules for ENR implementation by significant municipal and industrial wastewater dischargers

Settlement Details

EPA will implement a publicly accessible tracking and accounting system to monitor progress toward WLAs and LAs

By Sept. 30, 2010, EPA will propose new stormwater regulations in the Bay watershed to more effectively achieve Bay TMDL goals and to expand the scope of regulated discharges

- EPA to take final action on these regulations by Nov. 19, 2012

By June 30, 2012, EPA will propose new CAFO regulations to more effectively achieve Bay TMDL goals and to increase the number of farms subject to these regulations

- EPA to take final action on these regulations by June 30, 2014

EPA will require an allocation for air deposition of nitrogen from the states in the Bay TMDL, so that some portion of the total nitrogen budget will be attributed to air pollution.

Settlement Details

A number of other required actions

- For example, EPA to develop a model state program for reducing discharges from septic systems

Agreement terminates on Dec. 31, 2017 (mid-point of proposed TMDL process by which 60% of progress toward WLAs and LAs is to be achieved)

If disputes arise, plaintiffs reserve right to re-introduce original lawsuit



Any questions?