Content Overview of the next Chesapeake Bay Ambient Water Quality Criteria Technical Addendum

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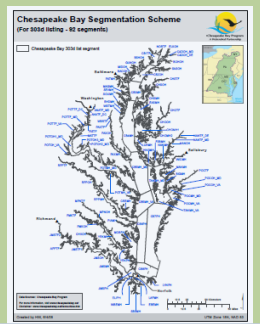
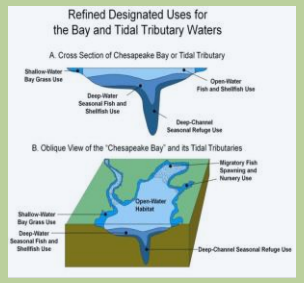
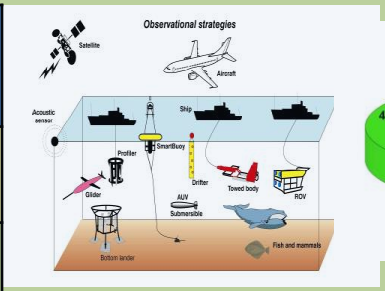
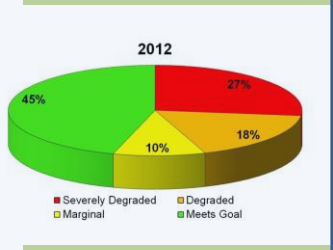
Water Quality Goal Implementation Team

The Water Quality Standards Framework and The New WQ Criteria Technical Addendum

- Updated per 2014 and 2015 CAP WG and EPA reviews
- Preparing for June 2015 delivery back to CAP WG
- STAC review – Summer 2015
- Visit with WQGIT again Summer 2015 for details on Short-duration criteria assessment
- Final edits from feedback - Fall 2015

The Water Quality Standards Framework and The New WQ Criteria Technical Addendum

Standard	Bay segmentation	Designated Uses	Water Quality Criteria	Assessment Protocols	Communicating Status & Change
			**Designated Use** / **Dissolved oxygen Criteria Concentration/ Duration** / **Temporal Application** **Deep channel seasonal refuge use** / **Instantaneous min > 1 mg/L** / **June 1 – September 30** **Deep channel seasonal refuge use** / **Open water F & S applies** / **October 1 – May 31**		
D.O.	Chap 3 Volume of WBRTF resolved supporting assessment and listing	Chap 2. Short duration DO Criteria Assessment Subseg options	-	Chap2. DO guidance and Chap 6. Nontraditional partners DO criteria assessment guidance	Chapter7. Multimetric Water Quality Index to track progress in attaining water quality standards
Water Clarity /SAV		Chap 4. SAV goal acreage alignment	-	-	
CHLA		-	-	-	
Aq. Life		-	-	Chap 5 Interim BIBI rule: Category classification for outliers	-

Chapter 2. Assessing Short-duration Dissolved Oxygen Criteria

- Issue

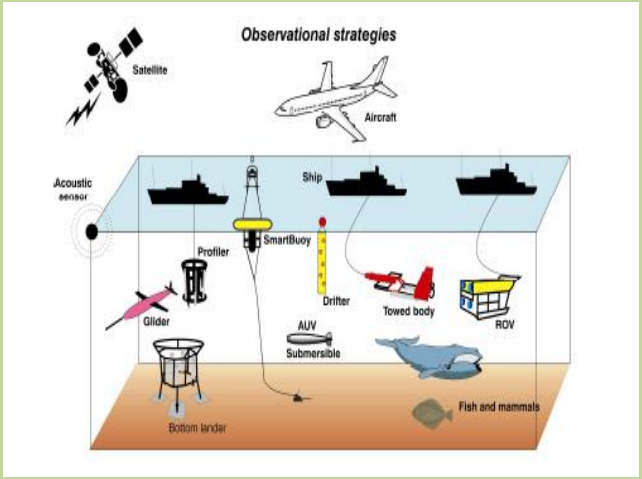
  There are more criteria on the books than we have had the monitoring capacity to effectively monitor.

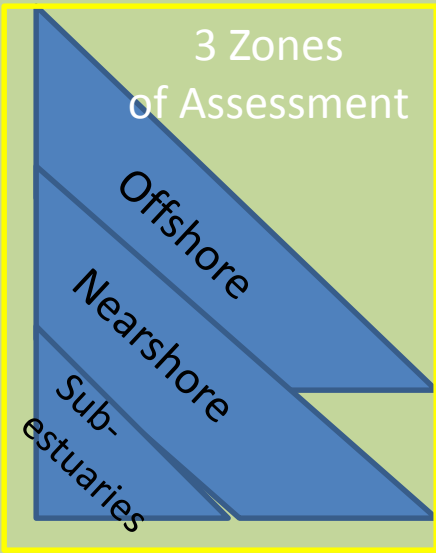
Designated Use	Criteria Concentration/Duration	Protection Provided	Temporal Application
Migratory fish spawning and nursery use	7-day mean ≥ 6 mg liter^{-1} (tidal habitats with 0-0.5 ppt salinity)	Survival/growth of larval/juvenile tidal-fresh resident fish; protective of threatened/endangered species.	February 1 - May 31
	Instantaneous minimum ≥ 5 mg liter^{-1}	Survival and growth of larval/juvenile migratory fish; protective of threatened/endangered species.	
	Open-water fish and shellfish designated use criteria apply		June 1 - January 31
Shallow-water bay grass use	Open-water fish and shellfish designated use criteria apply		Year-round
Open-water fish and shellfish use	30-day mean ≥ 5.5 mg liter^{-1} (tidal habitats with 0-0.5 ppt salinity)	Growth of tidal-fresh juvenile and adult fish; protective of threatened/endangered species.	Year-round
	30-day mean ≥ 5 mg liter^{-1} (tidal habitats with >0.5 ppt salinity)	Growth of larval, juvenile and adult fish and shellfish; protective of threatened/endangered species.	
	7-day mean ≥ 4 mg liter^{-1}	Survival of open-water fish larvae.	
	Instantaneous minimum ≥ 3.2 mg liter^{-1}	Survival of threatened/endangered sturgeon species.[1]	
Deep-water seasonal fish and shellfish use	30-day mean ≥ 3 mg liter^{-1}	Survival and recruitment of bay anchovy eggs and larvae.	June 1 - September 30
	1-day mean ≥ 2.3 mg liter^{-1}	Survival of open-water juvenile and adult fish.	
	Instantaneous minimum ≥ 1.7 mg liter^{-1}	Survival of bay anchovy eggs and larvae.	
	Open-water fish and shellfish designated-use criteria apply		October 1 - May 31
Deep-channel seasonal refuge use	Instantaneous minimum ≥ 1 mg liter^{-1}	Survival of bottom-dwelling worms and clams.	June 1 - September 30
	Open-water fish and shellfish designated use criteria apply		October 1 - May 31

[1] At temperatures considered stressful to shortnose sturgeon (>29°C), dissolved oxygen concentrations above an instantaneous minimum of 4.3 mg liter^{-1} will protect survival of this listed sturgeon species.

Chapter 2. Assessing Short-Duration DO Criteria in Chesapeake Bay. Options.

- Measure water quality at high temporal frequency.
- Use a Conditional Attainment approach.
- Subsegment Open Water and apply zone-specific method.





Conditional Attainment:

Compute one statistic for one time scale (e.g. 30-day mean DO) to inform conditions at another time scale.

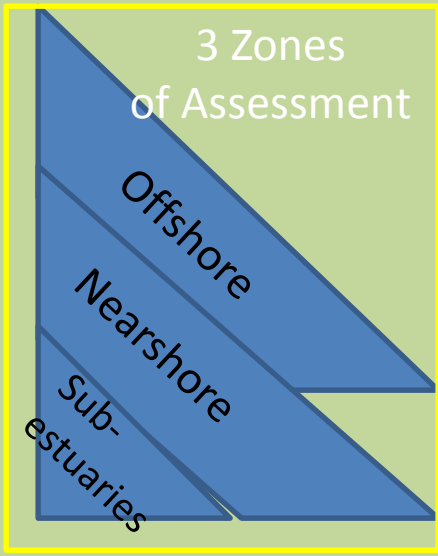
History:

- Jordan et al. 1996 – A seasonal mean DO could provide a good measure of meeting other DO thresholds.
- U.S. EPA 2003 – Recommends estimating “probable attainment” to address short duration criteria.
- U.S. EPA 2004 – Demonstrates levels of protection of one criterion for other, short duration criteria.
- U.S. EPA 2010 – Modeled “Umbrella Criterion” application.
- CBP-STAC 2012 – Umbrella Criterion report, options.
- 2015 – New Tech addendum report. Renaming the approach “Conditional Attainment”.

Subsegmenting and Assessing Open Water.

3 Zones:

- Supporting Instantaneous minimum assessments.
- U.S. EPA 2003x 305b guidance: 3 zone approach to assessing estuarine habitats
- VADEQ applies approach to non-Bay criteria tidal water assessments citing U.S. EPA 2003x.
- Boynton et al. (2014) illustrates habitat differences in DO behavior for 3 zones.



Designated Use	Dissolved oxygen Criteria Concentration/Duration		Temporal Application
Migratory fish spawning and nursery use	7-day mean ≥ 6 mg/L tidal habitats with 0-0.5ppt salinity		February 1 – May 31
	Instantaneous min ≥ 5 mg/L		
	Open water fish & shellfish designated use criteria apply		June 1 – January 31
Shallow water Bay grass use	Open water fish & shellfish designated use criteria apply		Year-round
Open water fish and shellfish use	30-day mean	≥ 5.5 mg/L Salinity: (0-0.5ppt)	Year-round
		≥ 5 mg/L Salinity: >0.5ppt	
	7-day mean	≥ 4 mg/L	
	Instantaneous min ≥ 3.2 mg/L		
Deep-water seasonal fish and shellfish use	30 day mean > 3mg/L		June 1 – September 30
	1-day mean >2.3 mg/L		
	Instantaneous min ≥1.7 mg/L		
	Open water Fish and shellfish designated use criteria apply		October 1-May 31
Deep channel seasonal refuge use	Instantaneous min > 1 mg/L		June 1 – September 30
	Open water F & S applies		October 1 – May 31

Criteria Assessment Coverage

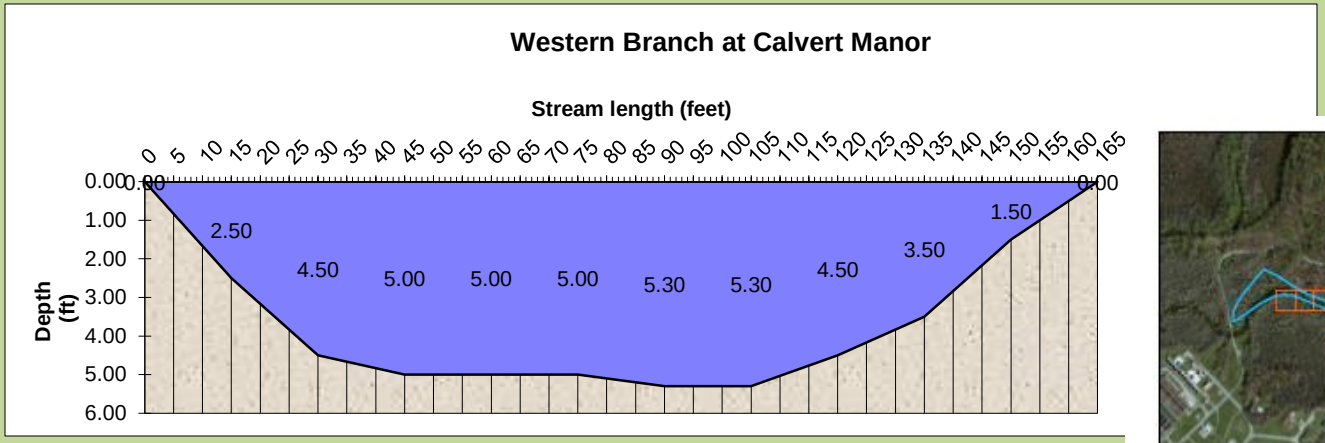
U.S. EPA 2003
U.S. EPA 2004
and more…

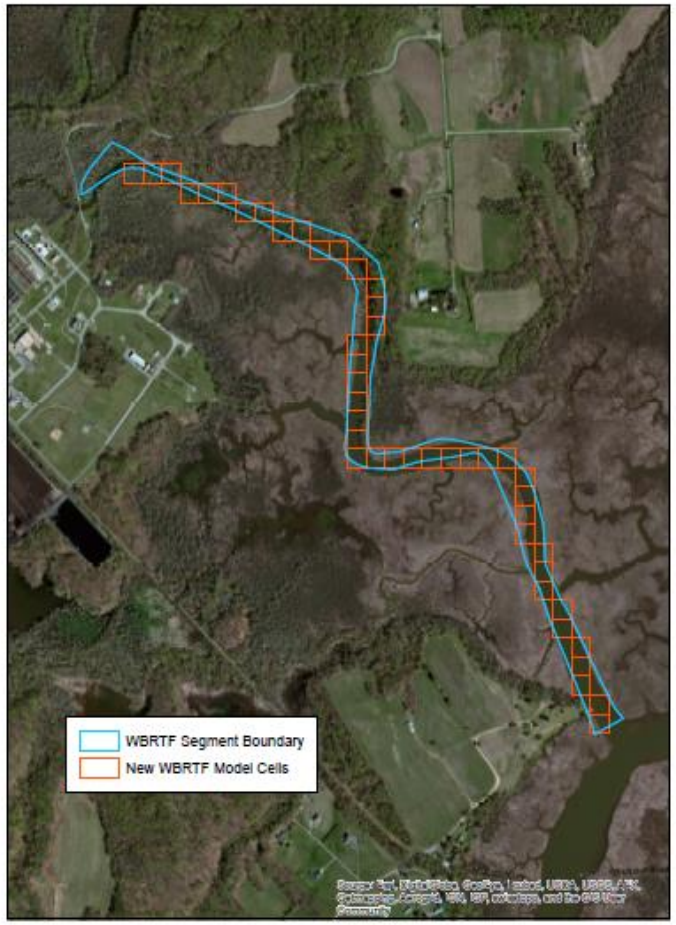
Umbrella Criterion – Summer Season assumption

Conditional Attainment or measure it.

TMDL basis: Meet summer and protect other seasons.

Chapter 3. Accounting for Missing Segment Volumes.





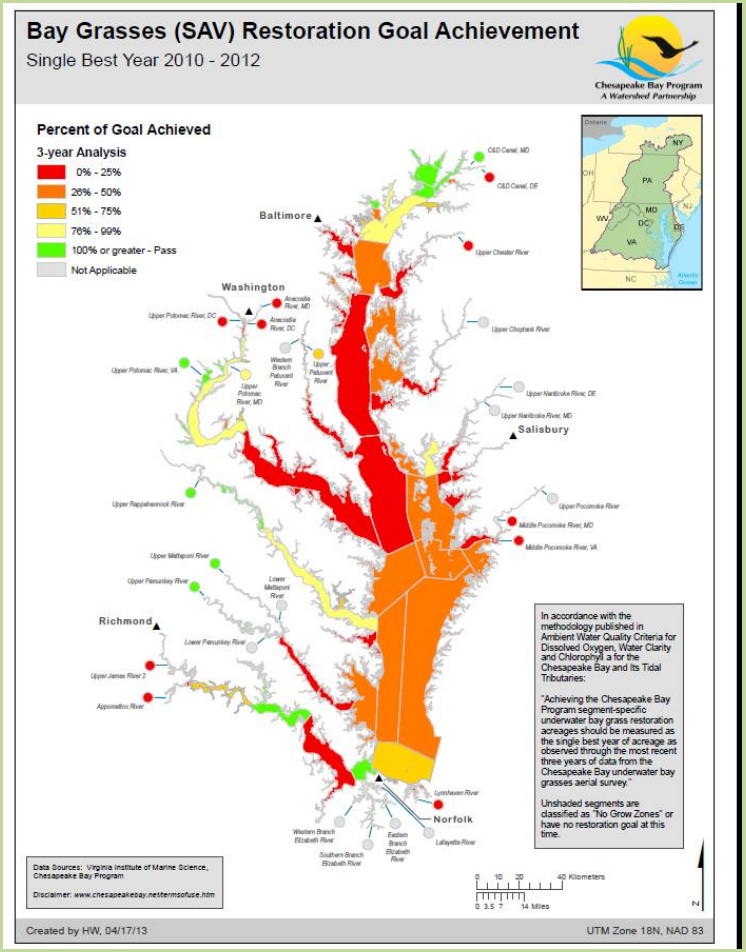
3 additional segments can be assessed for impairment

- Western Branch (PAX) Tidal Fresh
  - Volume estimation was developed by CBPO in cooperation with MDE to support WQ Stds assessment of segment WBPRTF.
- Anacostia-TF MD and Patuxent TF segments
  - Agreement to use the Bay Model segment volumes as the best available estimates of their volumes for impairment assessments.

Chapter 4. Alignment of the Chesapeake Bay SAV Restoration Goals.

Issue:

- Chesapeake Bay Program staff identified a difference between the 2003 SAV goal target (185,000 acres) adopted by Chesapeake Bay Program partnership and the existing SAV target acreage goal based on the sum of State/DC adopted Chesapeake Bay water quality standards (192,000 acres) used in the TMDL.



Decision: Goal Alignment of 192,000 Acre Standard

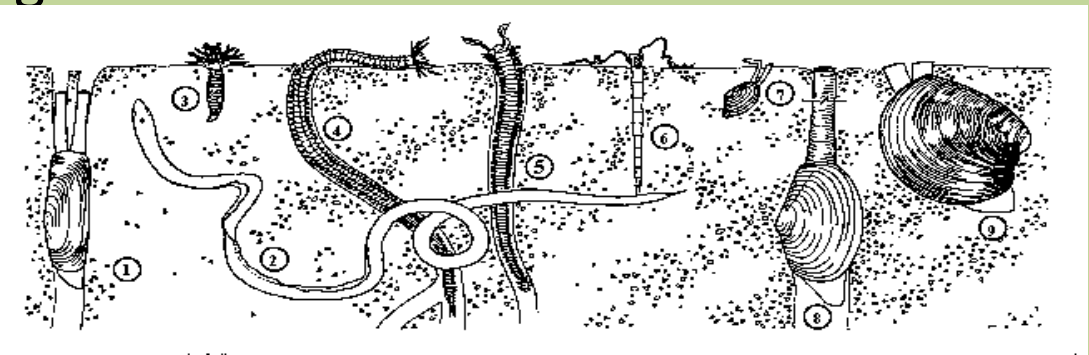
- Alignment of the outdated 185,000 acre Chesapeake Bay SAV restoration goal with the TMDL that is based on State water quality standards (192,000 acres).

Chapter 6. Chesapeake Bay Benthic IBI
Interim Assessment Rules in lieu of a complete BIBI recalibration

- There are 4 segments where BIBI results make little sense under existing decision rules (i.e., scores are poor, classified as attained).

- An interim recommendation for classification of “insufficient information” is being applied.

- Work is being supported by EPA to help alleviate this interim classification issue by updating the reference community assessment with 10 more years of data and recalibrating the IBI.



Chapter 5. Recommendation: Interim Rules for Using BIBI to support Aquatic Life Use Assessments

For segments where "Impaired = No" identify those segments that have a breadth of confidence limits (Upper confidence Limit - Lower confidence Limit ≥ 0.5) of .5 or greater. Of that subset of segments, those that have a Mean BIBI <2.7 would be classified as <u>Category 3</u> (insufficient information) until more conclusive information is available.

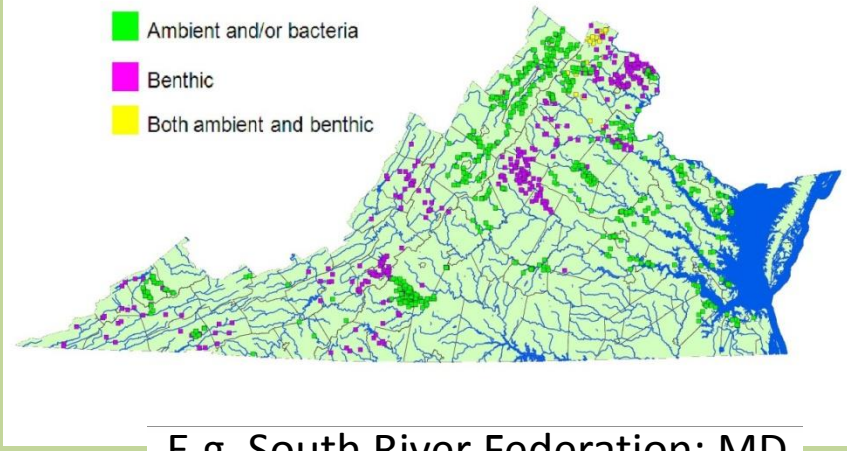
**WQGIT supported 2013*

Classification Category for Water Quality Status	Description
Category 1	All designated uses are supported, no use is threatened.
Category 2	Available data and/or information indicate that some, but not all, designated uses are supported.
Category 3	There is insufficient available data and/or information to make a use support determination.
• Category 3a	• VA: no data are available within the data window of the current assessment to determine if any designated use is attained and the water was not previously listed as impaired.
• Category 3b	• VA: some data exist but are insufficient to determine support of designated uses. Such waters will be prioritized for follow up monitoring, as needed.
• Category 3c	• VA: data collected by a citizen monitoring or another organization indicating water quality problems may exist but the methodology and/or data quality has not been approved for a determination of support of designated use(s). These waters are considered as having insufficient data with observed effects. Such waters will be prioritized by DEQ for follow up monitoring.
• Category 3d	• VA: data collected by a citizen monitoring or other organization indicating designated use(s) are being attained but the methodology and/or data quality has not been approved for such a determination.
Category 4	Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.
• Category 4a	• A State developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination.
• Category 4b	• Other required control measures are expected to result in the attainment of an applicable water quality standard in a reasonable period of time.
• Category 4c	• The non-attainment of any applicable water quality standard for the segment is the result of pollution and is not caused by a pollutant.
Category 5	Available data and/or information indicate that at least one designated use is not being supported or is threatened, and ***a TMDL is needed***.

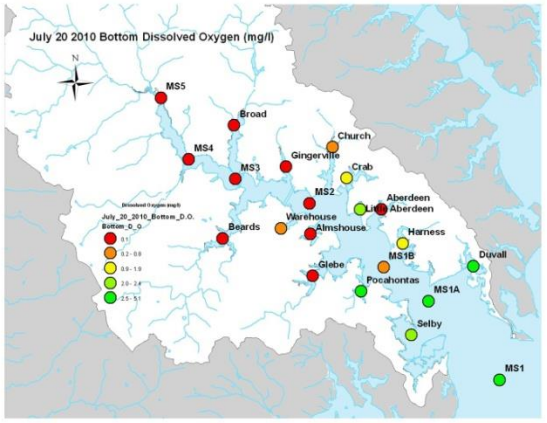
Chapter 6. Nontraditional Partner DO data collection and handling protocol

- Guidance is provided for nontraditional partners to follow EPA protocol for inclusion of their data in regulatory DO assessments.

E.g. Alliance for the Chesapeake: VA



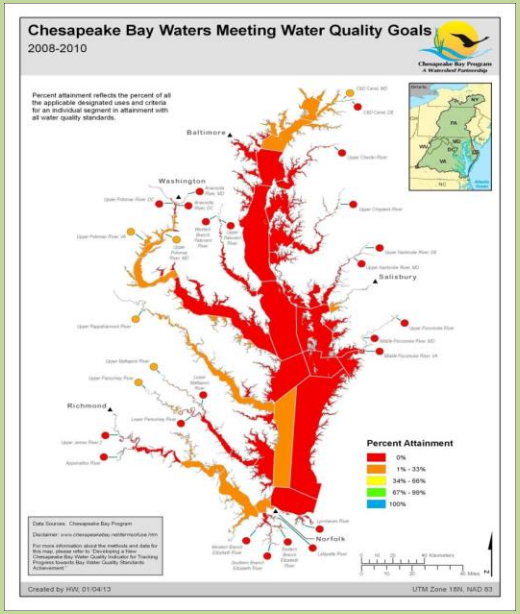
E.g. South River Federation: MD

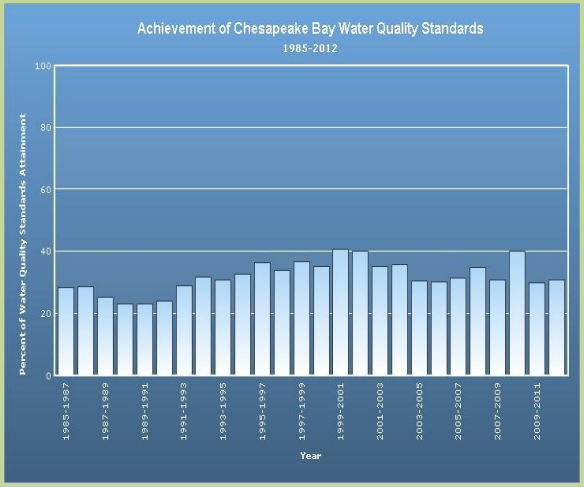


Chapter 8. Multimetric Water Quality Standards Indicator for Supporting Progress Tracking in Bay Restoration

Summary:

- Indicator created at CBPO
- It documents the use of DO + Water Clarity/SAV + CHLA standards attainment assessments in a multimetric assessment of progress. (Liza H, Lea R)
- * Approved by WQGIT (and Management Board I think) in 2013.





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Next steps:

- Preparing for June 2015 delivery back to CAP WG final approval of protocols.
- STAC review – Summer 2015
- Visit with WQGIT again Summer 2015 for details on Short-duration criteria assessment
- Final edits from feedback; Review with GIT and GIT Approval - Fall 2015


Köszönettel
Gracias
Teşekkürler
THANK YOU
Vielen Dank
תודה
Grazie
Merci
Díky

Summary

Chapters of Technical Addendum	Actions
Missing seg volumes	CAPWG approval.
Open water/Shallow water designated use	WQGIT Approved.
Instantaneous minimum assessment frame	Concept approved by CAP WG to take forward. Decision rules by CAP WG vetted. Review for final consideration.
SAV goals/reporting	WQGIT approval June 9, 2014.
Short duration criteria assessment	Approved concept by WQGIT. Final work coordinated with CAP WG and EPA in 2014/15.
BIBI interim rule	Approved by WQGIT
Nontraditional Partner contribution	CAP WG approval of concept (Chapter revised for final ok)
WQ Standards Index	Approved by WQGIT