Being Accountable/Communicating Assessment Information to the Public in 2013

Update to the STAR Team

October 2013

Nita Sylvester, EPA CBPO
Chair of STAR's Indicators Workgroup

Purpose of Briefing

- Bay Barometer timeline
- Indictor updates, including new water quality standards indicator
- Recommendations for indicator removals from “Track the Progress” section of ChesapeakeBay.net

Background

- CBP Indicators:
  - approved by MB
  - available from “Track the Progress” section of www.ChesapeakeBay.net
- Bay Barometer:
  - CBP partnership’s annual health & restoration assessment of Bay and its watershed; approved by MB
  - Last year’s BB:
    - synthesis of data posted on website during past year
    - emphasized visual readability and clear messaging
    - brief, highly-summarized info from many CBP-approved indicators used to drive readers to the website

Bay Barometer Timeline – Key Deadlines

- 9/23/13: MB review – comments due 9/27/13
- 9/30/13: Updated indicator data due
  - Most indicators already updated
  - Deadline applies to hard copy report production
  - Indicators continue to be updated on the website after 9/30/2013.
- 10/4/13: Text/images to designer
- 10/24/13: Final report to printer
- 11/4/13: Report completed
- 11/6/14: News release (tentative)
  - Even if most current information is not featured in hard copy report, when folks go to website they will see the most current information.

New Indicators

- To be developed to track new Agreement outcomes
  - e.g. Brook Trout
- Completed: Achievement of Bay Water Quality Standards
  - measures progress towards achievement of WQS, fully consistent with how DE, DC, MD, and VA currently list their portion of the Bay's tidal waters.
  - Component indicator pages (dissolved oxygen, clarity/underwater bay grasses, chlorophyll *a)* to be revised by end of 2013.

Update on Current Indicators

- What's been updated since last BB was published?
- What remains to be updated?
- What else will be revised?
- What will be replaced?
- What's being recommended for deletion from "Track the Progress" section of ChesapeakeBay.net?
  - Info on these topics will continue to be available in other locations of Bay.net website, per user audience interest.
  - Com WG will continue to work with STAR to ensure those pages refer to best science available

Factors Impacting Bay and Watershed Health

Pollutant s	Land Use	Natural Factors
• Nitrogen (R) • Phosphorus (R) • Sediment (R)	• Population • Forest Cover	• River Flow

- Green: previously reported indicator already updated
- Black: previously reported indicator to be updated
- Black: w/ “(R)”: previously reported indicator to be revised

Bay Health

Habitats & Lower Food Web	Fish & Shellfish Abundance	Water Quality

• SAV- baywide abundance
  • abun by zone
  • density
• Bottom Habitat
• Tidal Wetlands
• ~~Phytoplankton~~
	• Blue Crabs
	• American Shad (R)
	• Oyster Biomass (R)
	• ~~Striped Bass~~
	• ~~Menhaden~~
		• *WQS Achievement*
		  • Dissolved Oxygen (R)
		  • Water Clarity (R)
		  • Chlorophyll *a* (R)
		• Chemical Contaminants

- Green: previously reported indicator already updated
- Green w/ "(R)": previously reported indicator already updated; to be revised
- *Green italics*: new indicator
- Black: previously reported indicator to be updated
- Black: w/ "(R)": previously reported indicator to be revised or replaced with new indicator
- ~~Strikeout text~~: previously reported indicator not updated and recommended for removal from "Track the Progress"

Watershed and River Health

Health of Freshwater Streams	Flow Adjusted Pollution Trends and Yield	Land Cover

• Health of Freshwater Streams in Watershed (R)	• Nitrogen: LT & ST FAC trends
	• Phosphorus: LT & ST FAC trends
	• Sediment: LT & ST FAC trends
	  • N - ST Yield
	  • P - ST Yield
	  • S - ST Yield
		• Forest Cover

- Green w/ "(R)": previously reported indicator already updated; to be revised
- Black: previously reported indicator to be updated

Restoration and Protection Efforts

Reducing Pollution	Restoring Habitats	Managing Fisheries	Protecting Watersheds	Fostering Stewardship

• Reducing N Pollution
• Reducing P Pollution
• Reducing S Pollution
  • Wastewater Treatment Plant Upgrades
	• Restoring Wetlands
	  • ~~Wetlands Enhance/ Rehab.~~
	• Reopening Fish Passage
	• Planting Bay Grasses (R)
	• Restoring Oyster Reefs (R)
		• Blue Crab Fishery Management	• Planting Forest Buffers
			• Protected Land
			• ~~Developing Watershed Management Plans~~
				• Public Access Sites
				  • ~~Water Trails~~
				  • ~~Bay Gateways~~
				• K-12 Education (R)

- Green: previously reported indicator already updated
- Green w/ "(R)": previously reported indicator already updated and revised
- Black: previously reported indicator to be updated
- Black: w/ "(R)": previously reported indicator to be replaced with new indicator
- ~~Strikeout text~~: previously reported indicator not updated and recommended for removal from "Track the Progress"

Requested Decision #1

- Recommend to MB: removal of current oyster indicators (abundance; reef restoration) from “Track the Progress”, while waiting for development of replacements.
  - Oyster info will continue to be available in other locations of Bay.net website (due to user audience interest).
  - Com WG will continue to work with STAR to ensure those pages refer to best science available.

Requested Decision #2

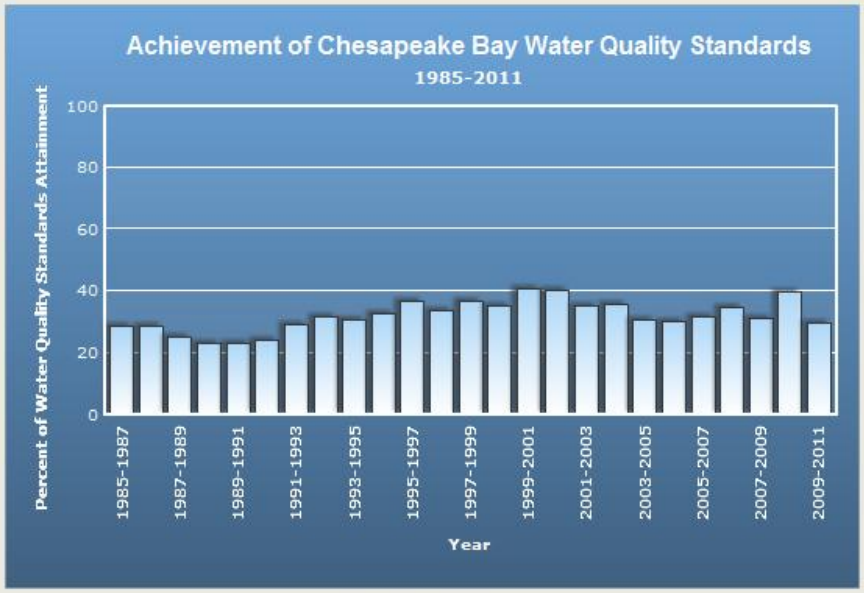
- Recommend to MB removal of these indicators from "Track the Progress":
  - Phytoplankton
  - Striped Bass Abundance
  - Juvenile Menhaden Abundance in MD
  - Wetlands Enhancement and Rehabilitation
  - Developing Watershed Management Plans
  - Bay Gateways Designated
  - Water Trails in the Bay Watershed
- Per user audience interest, info will continue to be available in other locations of Bay.net website.
- Com WG will continue to work with STAR to ensure those pages refer to best science available.

- Supplemental slides in case website does not work properly during presentation

Achievement of Chesapeake Bay Water Quality Standards

Results for 2009-2011 indicated that 30% of the Bay was attaining water quality standards.

Annual | Videos



Data File (20.48 KB)

Analysis and Methods File (48.6 KB)

Importance

This indicator measures progress towards the achievement of water quality standards for dissolved oxygen, water clarity/underwater bay grasses and chlorophyll a for each 3-year assessment period beginning in 1985. The indicator is fully consistent with how Delaware, the District of Columbia, Maryland, and Virginia currently list their portion of the Bay's tidal waters, and provides a means for illustrating improvements through time. Additionally, this indicator is being used to measure progress toward the Chesapeake Bay Executive Order Strategy's water quality outcome.

Trends

Long-term Trend (1985-2011)
An informal linear trend analysis suggests a gradually increasing (i.e., improving) trend since 1985 for every 3-year assessment period. Formal, statistically rigorous long-term trend analyses have not been completed on the attainment of water quality standards.

Short-term Trend (2001-2011)
An informal linear 10-year trend analysis suggests no trend since 2001 for every 3-year assessment period. Formal, statistically rigorous trend analyses have not been completed on the attainment of water quality standards.

period. Formal, statistically rigorous long-term trend analyses have not been completed on the attainment of water quality standards.

Short-term Trend (2001-2011)
An informal linear 10-year trend analysis suggests no trend since 2001 for every 3-year assessment period. Formal, statistically rigorous trend analyses have not been completed on the attainment of water quality standards.

Change from Previous Year
Results for 2009-2011 indicated that 30% of the Bay was attaining water quality standards. These results are not significantly different from those of the previous assessment year (2008-2010) in which 40% of the Bay was attaining water quality standards.

Additional Information

Nutrients, along with sediments, are the primary causes of impairments to the Chesapeake Bay and its tidal tributaries. To meet the objectives of the Clean Water Act, the EPA's implementing regulations specify that states must adopt criteria that contain sufficient parameters to protect existing and designated uses. In 2003, EPA Region III developed Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity, and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries. This was developed in order to achieve and maintain water quality conditions necessary to protect the aquatic living resources of the Chesapeake Bay and its tidal tributaries from the effects of nutrient and sediment pollution. Within the publication, five designated uses were identified and described, that when adequately protected, will ensure the protection of the living resources therein.

The methodology used for the calculation of the indicator considers the achievement or non-achievement of the dissolved oxygen, water clarity/underwater bay grasses, and chlorophyll a water quality standards applicable to a designated use within a segment. Rather than reporting progress only when all designated uses are met within a segment, this methodology reports when a water quality standard is met for each of the designated uses in that segment; therefore, rather than reporting on the 92 Chesapeake Bay segments used for the establishment and management of the Chesapeake Bay Total Maximum Daily Load (TMDL), this methodology reports on 291 designated-use segments contained within.

This indicator uses a surface area-weighted approach, which multiplies the surface area of each of the 92 segments times the number of applicable designated uses and criteria for that segment. This approach factors in the relative size of each segment, ensuring we report the best available measure of how much of the Bay tidal waters were achieving water quality standards. At the same time, this approach gives equal weight to achievement of the criteria protective of each designated use and segment, preventing any need to weigh differently the importance of restoring dissolved oxygen versus bringing back underwater bay grasses. Restoration of a fully functioning Chesapeake Bay ecosystem requires attainment of all five designated uses and their applicable criteria. This indicator consolidates the baywide results in the final calculations and reports percent of Bay water quality standards in attainment.

Who to Contact

Liza Hernandez
University of Maryland Center for Environmental Science (UMCES)
(410) 295-1321

Source of Data

Chesapeake Bay Program

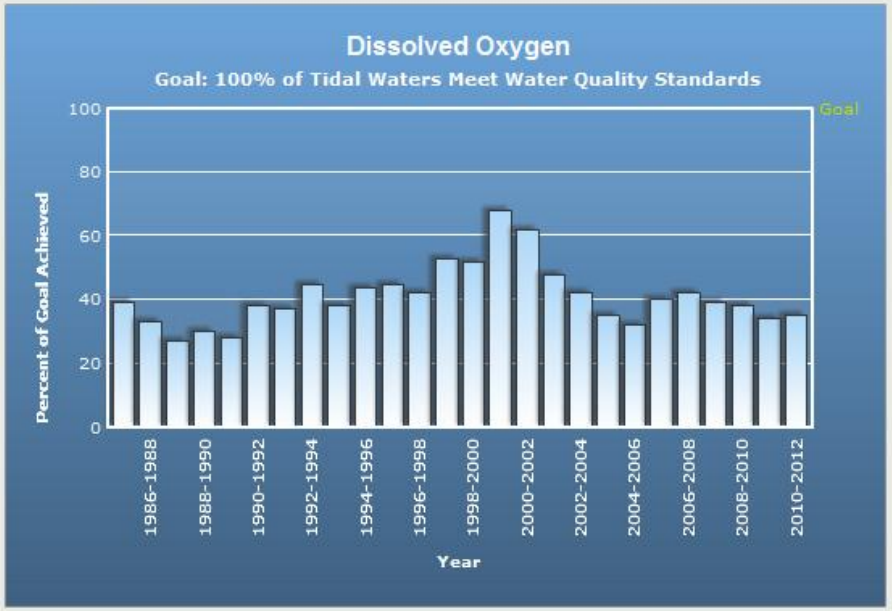
Related Indicators

- Dissolved Oxygen
- Underwater Bay Grass Abundance (Baywide)
- Mid-Channel Water Clarity
- Chlorophyll a

Dissolved Oxygen

Data gathered from 2010 to 2012 indicate that 35 percent of the combined volume of open-water, deep-water and deep-channel water of the Bay and its tidal tributaries met dissolved oxygen standards during summer months.

Annual | Maps | Videos



Data (43 KB)

Analysis & Methods (70 KB)

Importance

Just as is the case for animals on land, oxygen is essential for all aquatic plants and animals to survive. In water, oxygen is present in a dissolved form. Adequate concentrations of dissolved oxygen in water are necessary for healthy ecosystem function; without the required amounts of oxygen in the water to support healthy ecosystem function, the Bay's ability to support aquatic life is compromised.

The necessary amount of dissolved oxygen varies by aquatic species, season and location within the Bay. Generally, aquatic animals need higher oxygen levels in shallow waters during spring spawning season. Slightly lower oxygen levels are acceptable during other times of the year, particularly in deeper waters.

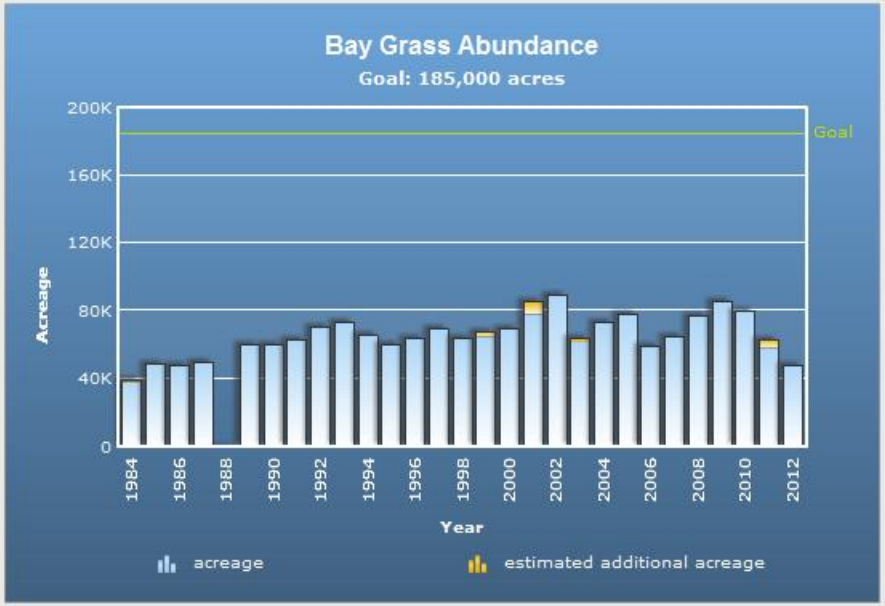
Concentrations of dissolved oxygen are also an important indication of levels of nutrient pollution in the Bay. Low dissolved oxygen levels are primarily the result of excess nutrient pollution, which fuels the growth of algae blooms. These algae eventually die and sink to the Bay's bottom, where they undergo the natural process of bacterial decomposition. During this process, bacteria use up the oxygen present in the water, leaving little for fish, shellfish and other forms of aquatic life. In general, greater quantities of excess nutrients being delivered to the Bay result in larger algae blooms within the receiving waters, leading to an increased amount of areas with low-oxygen concentrations (i.e., dead zones).

Goal

Underwater Bay Grass Abundance (Baywide)

In 2012, there were an estimated 48,191 acres of underwater grasses in the Chesapeake Bay, achieving 26 percent of the 185,000-acre goal.

Annual | Maps | Videos



Analysis & Methods (100 KB)

Data (145.62 KB)

Importance

Underwater grasses provide significant benefits to aquatic life and serve many critical ecological functions in the Bay and its tributaries, such as:

- Providing shelter for young striped bass, blue crabs and other species
- Improving water clarity by helping suspended sediment particles settle to the bottom
- Adding oxygen to the water
- Reducing shoreline erosion

Scientists believe that having more grasses in the Bay and rivers will dramatically improve the entire ecosystem. The expectation is that as nutrient and sediment pollution decrease and water clarity improves, underwater grass acreages should expand. Experts closely monitor underwater grasses because their well-being is dependent on good local water quality. Therefore, their abundance is an excellent measure of the Bay's health.

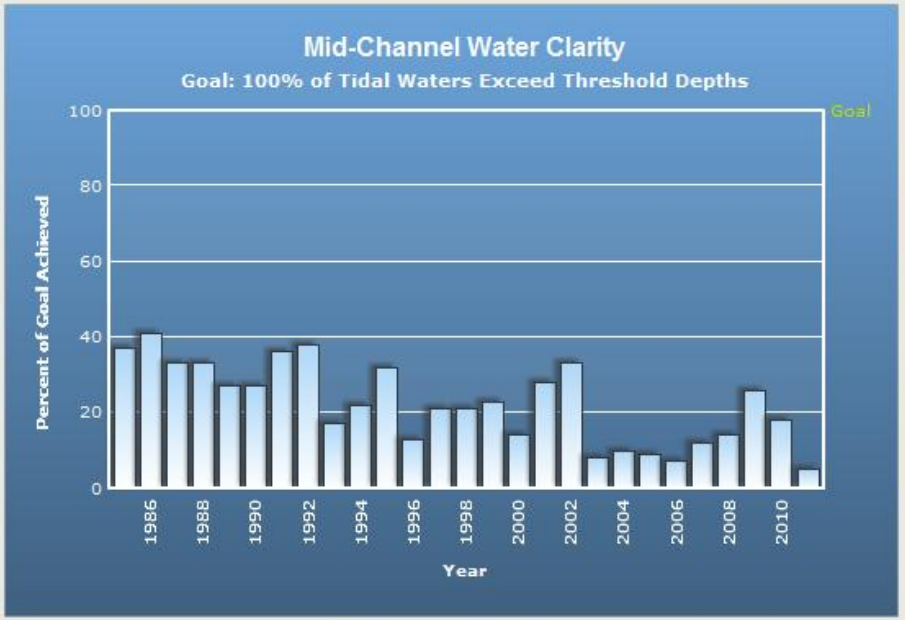
Goal

The goal is to have 185,000 acres of underwater grasses in the Chesapeake Bay. This acreage represents approximate historic

Mid-Channel Water Clarity

In 2011, 5 percent of tidal waters met goals for water clarity. This was a decrease from 2010, when 18 percent met goals.

Annual | Maps | Videos



Download Data (67.5 KB)

Download Analysis & Methods (52 KB)

Importance

Water clarity measures the depth to which light can penetrate into the water. It is routinely hindered by the amount of fine sediment, plankton and other debris suspended in the water. Greater water clarity generally leads to a healthier Bay.

Goal

The goal is for 100 percent of the Chesapeake Bay to meet thresholds for water clarity. In general, visibility to a depth greater than 0.65 – 2 meters (depending on salinity of waterbody) during the underwater bay grass growing season is acceptable.

Trends

Long-term Trend (1985-2011)

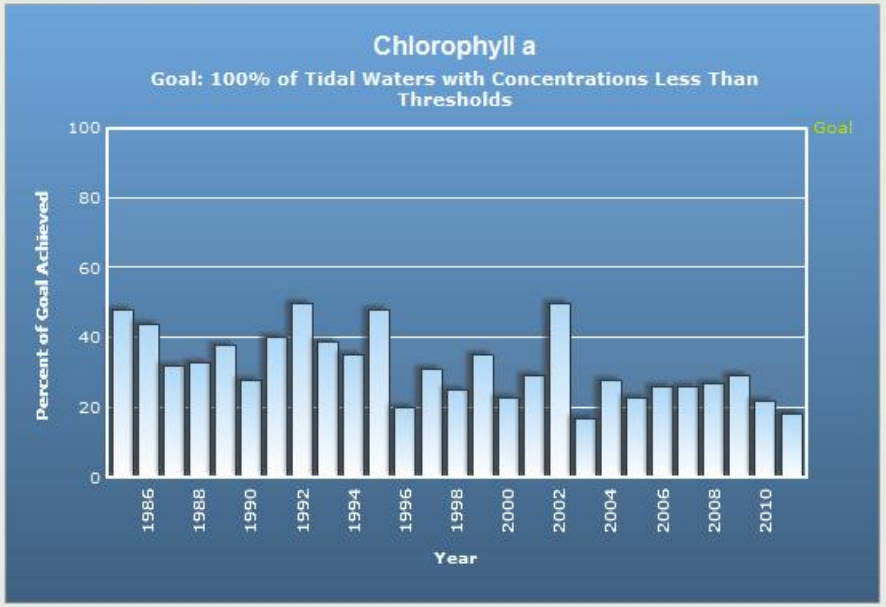
Interannual variation of Secchi depth is high in the Bay but the long-term trend indicates that Bay water has become more turbid (less clear). Goal achievement has averaged 22 percent and has ranged from 5 percent to 41 percent.

Short-term Trend (10-year Trend)

Chlorophyll a

In 2011, 18 percent of tidal waters had chlorophyll a concentrations that achieved the goal. This is a decrease of 4 percent from 2010.

Annual | Maps | Videos



Download Data (66.5 KB)

Download Analysis & Methods (53.5 KB)

Importance

Scientists study chlorophyll a to determine the amount of algae present in the Bay.

Algae are the foundation of the food web and are a necessary part of a balanced ecosystem. However, too much algae can block sunlight from reaching underwater grasses, reducing the habitat and oxygen that underwater life need to survive. The range of acceptable chlorophyll a concentrations varies by season and salinity.

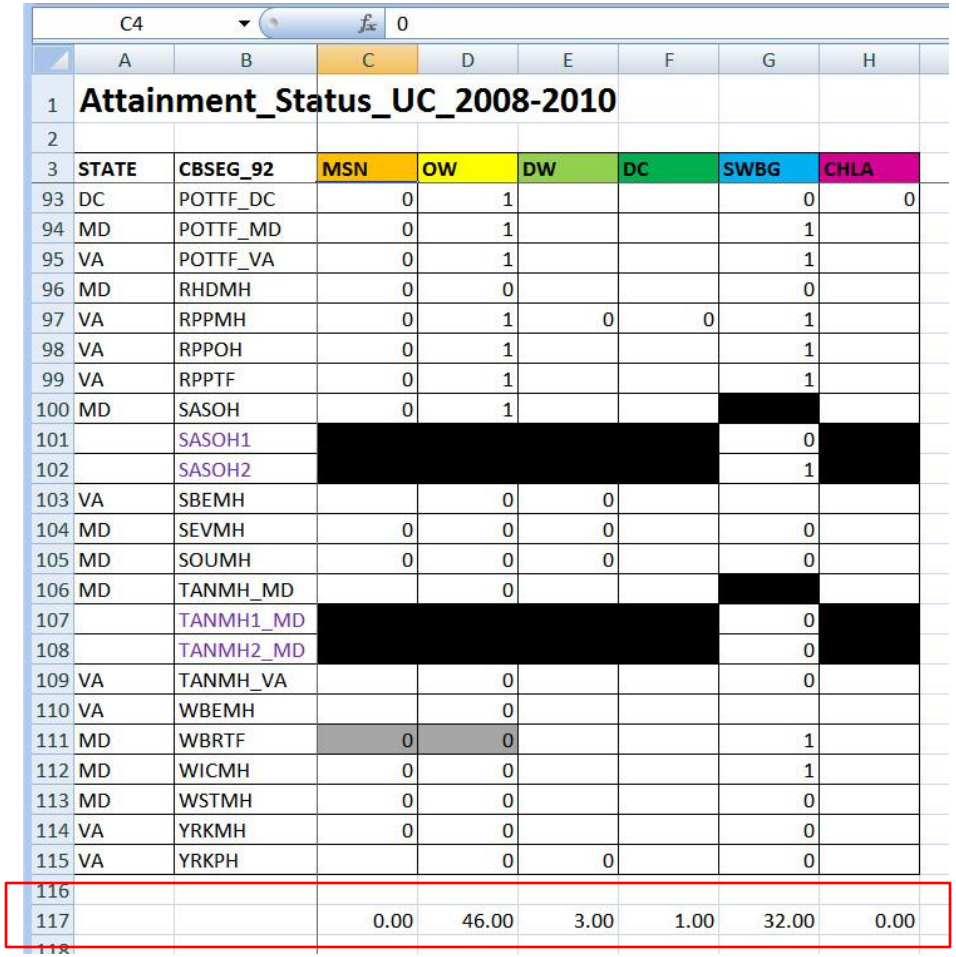
Goal

The goal is for 100 percent of Chesapeake Bay tidal waters to be below certain threshold concentrations of chlorophyll a that are acceptable to underwater bay grasses.

Trends

Long-term Trend (1985-2011)

The area of the Bay meeting (i.e., less than or equal to) its chlorophyll a threshold concentrations has high interannual variability, but has generally shown a decreasing (degrading) trend over the period of record. Goal achievement has averaged 32 percent and ranged



C4 0

	A	B	C	D	E	F	G	H
1	**Attainment_Status_UC_2008-2010**							
2								
3	**STATE**	**CBSEG_92**	**MSN**	**OW**	**DW**	**DC**	**SWBG**	**CHLA**
93	DC	POTTF_DC	0	1			0	0
94	MD	POTTF_MD	0	1			1	
95	VA	POTTF_VA	0	1			1	
96	MD	RHDMH	0	0			0	
97	VA	RPPMH	0	1	0	0	1	
98	VA	RPPOH	0	1			1	
99	VA	RPPTF	0	1			1	
100	MD	SASOH	0	1				
101		SASOH1					0	
102		SASOH2					1	
103	VA	SBEMH		0	0			
104	MD	SEVMH	0	0	0		0	
105	MD	SOUMH	0	0	0		0	
106	MD	TANMH_MD		0				
107		TANMH1_MD					0	
108		TANMH2_MD					0	
109	VA	TANMH_VA		0			0	
110	VA	WBEMH		0				
111	MD	WBRTF	0	0			1	
112	MD	WICMH	0	0			1	
113	MD	WSTMH	0	0			0	
114	VA	YRKMH	0	0			0	
115	VA	YRKPH		0	0		0	
116								
117			0.00	46.00	3.00	1.00	32.00	0.00