

# Estimated Achievement of Water Quality Standards in tidal waters of Chesapeake Bay

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WQGIT meeting preview

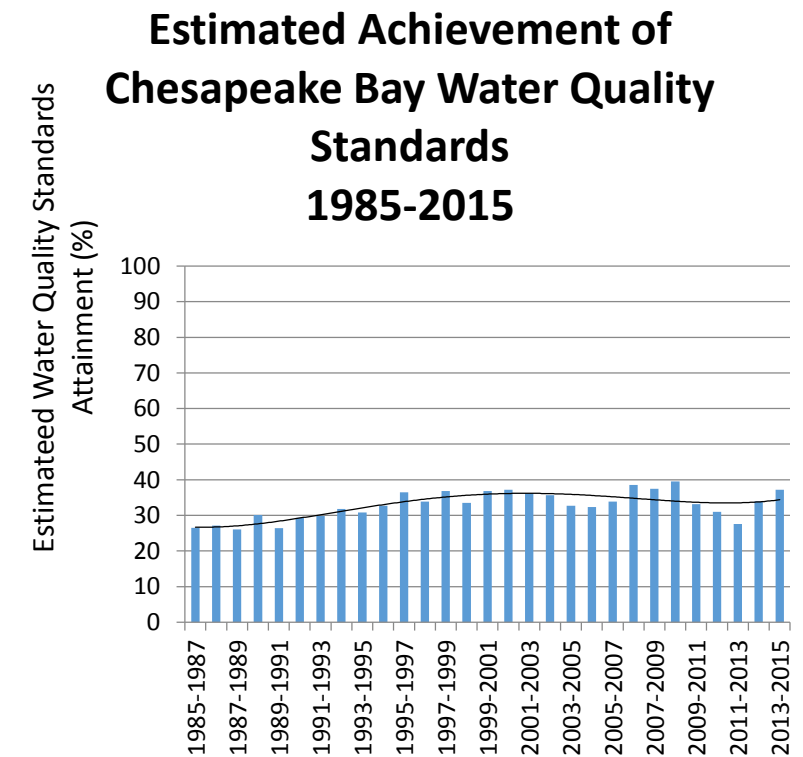
August 2016

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# Reminder:

## The Multimetric Indicator Estimates Attainment

- It is a roll-up indicator of the best available baywide monitoring information for dissolved oxygen, water clarity/SAV and (where applicable) chlorophyll a.
- Assessments are in 3 year blocks.
- Surface area weighted by segment size.
- It is not a 1:1 accounting of all the applicable water quality standards
  - There are more criteria on the books than are currently being assessed.
- There are rules in place that make the indicator an **ESTIMATE** of standards attainment IF we had all the required information for reporting.



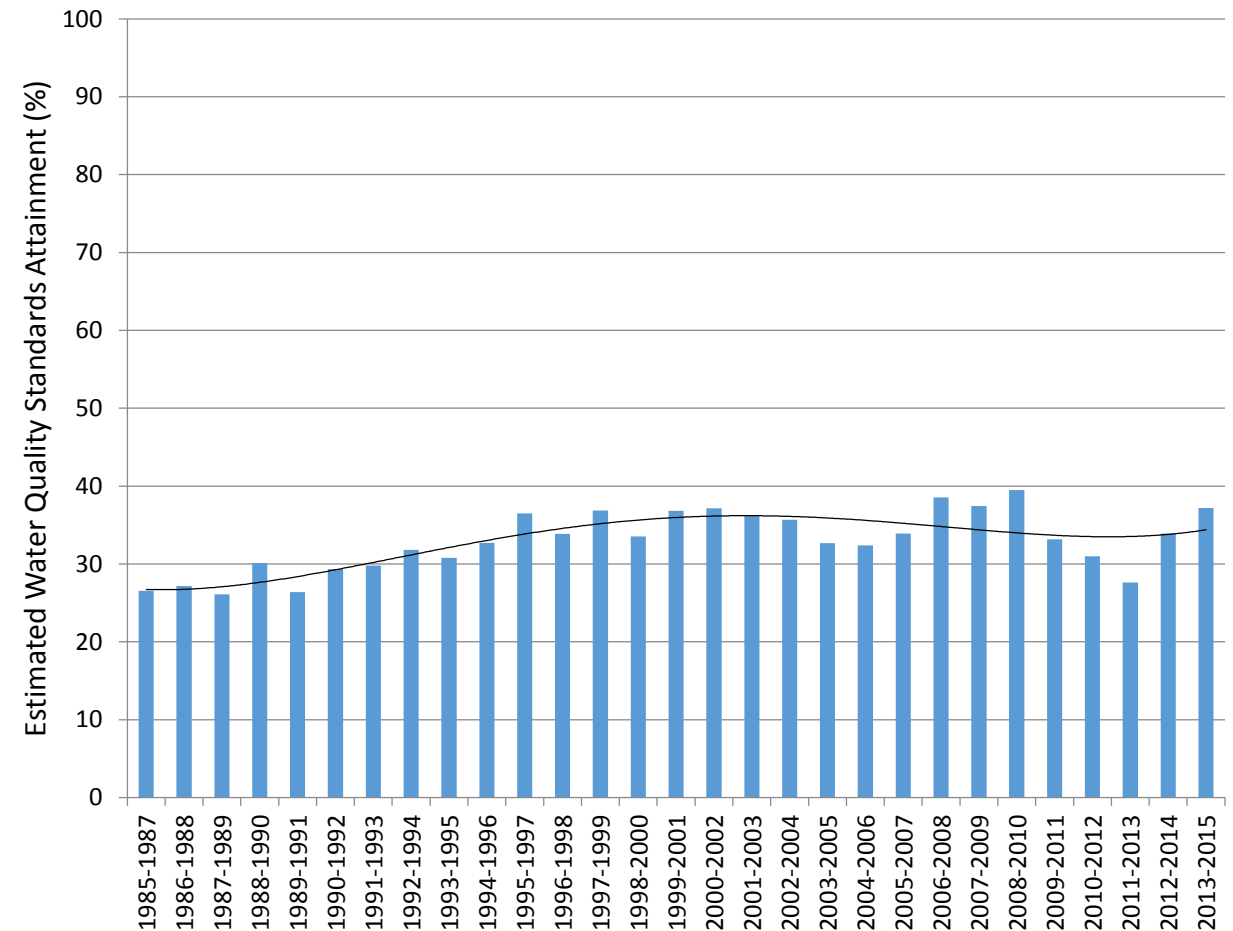
# 2013-2015 Multimetric Standards Indicator results.

- Score: 37.2
  - 4<sup>th</sup> best score since the start of the data record in 1985.
  - Increase 10% (3.3 points) from last year's 2012-2014 assessment when it was 33.9.
  - This score is a 35% improvement (9.6 points) over two years ago, its recent low point of 27.6, which was the 5<sup>th</sup> worst measure since 1985.

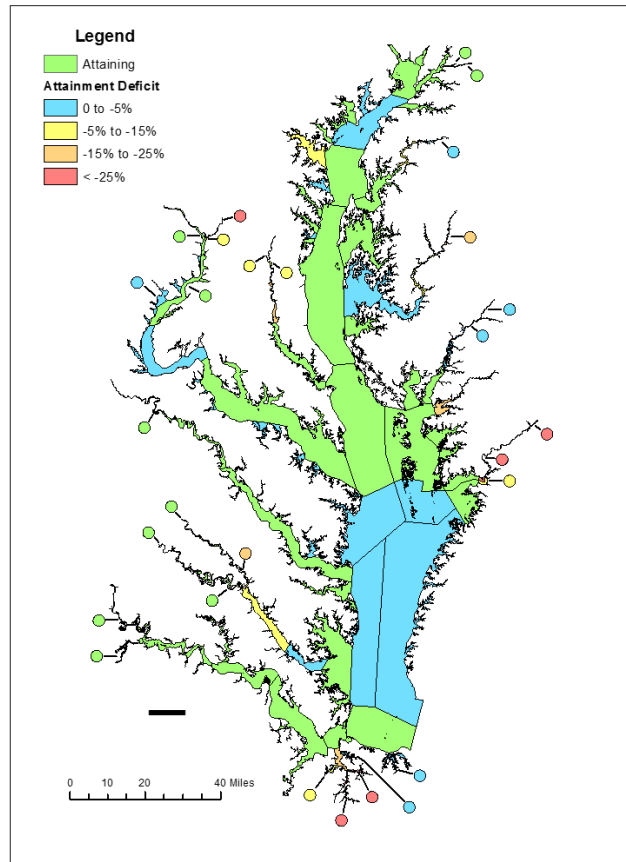
# Long term variable patterns in time.

- Upward trend 1985 to early 2000s
- Decline in mid-2000s coincident with wet period after a 4 year drought that ended in 2002
- Rebound through mid 2000s to 2010.
- Decline after Tropical Storm Lee
- Rapid rebound in scores after the effects of the tropical storm no longer impact the indicator

**Estimated Achievement of Chesapeake Bay Water  
Quality Standards  
1985-2015**

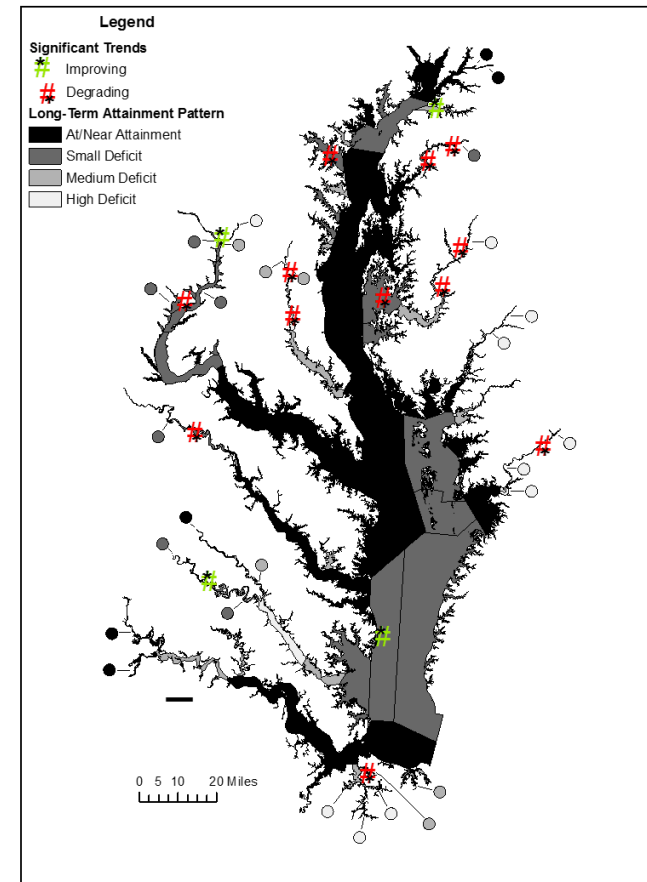


# Spatial patterns of attainment for the metrics through 2012-2014 show areas to target.



Open Water summer 30-day mean status  
2012-2014 assessment period

Large areas of the Bay and tributaries are at or near attainment.

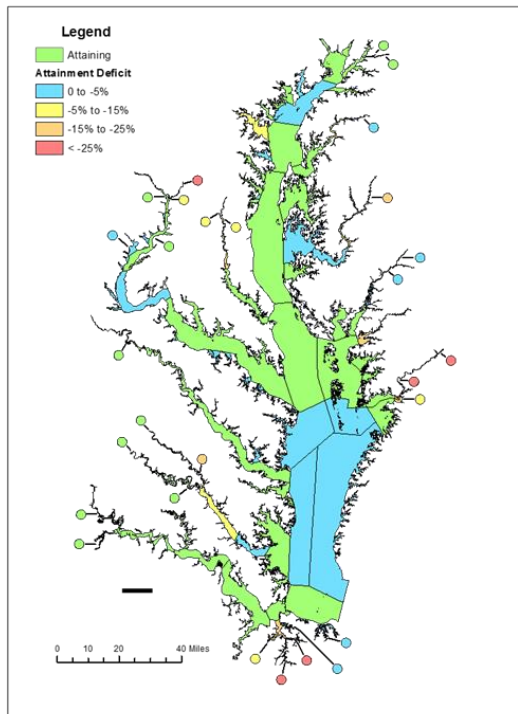


Attainment Deficit Trends

4 improving, 12 degrading, 40 no trend

# Dissolved Oxygen – Attainment Deficit and its trends.

## Summer 30-day means (Open water, deep water) and instantaneous minimum (Deep Channel).



2012-14

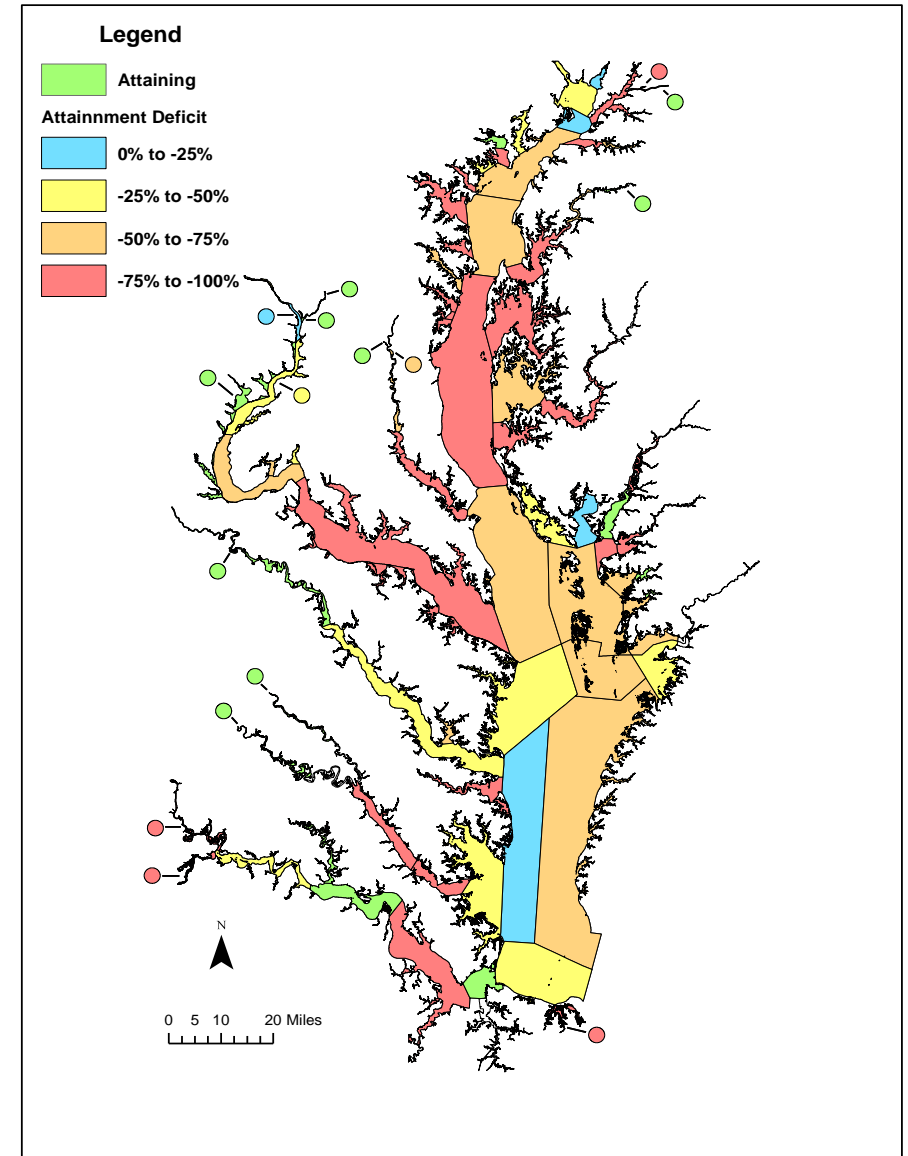
Open water

Summer 30-day mean  
Attainment status

	1985-2014 ATTAINMENT DEFICIT				1985-2014 TRENDS IN THE DEFICIT	
DU (SEGMENTS)	At/Near Attainment	Small Deficit	Medium Deficit	High Deficit	Improving (↑)	Degrading (↓)
OW (92)	36	23	21	12	4	12
DW (18)	4	2	10	2	1	1
DC (10)	1	0	3	6	0	4

# Water Clarity/SAV: Shallow water bay grass designated use

- Areas attaining their goals tend to be in a collection of small segments throughout tributaries.
- Attaining segments are widely distributed throughout tidal waters of the Bay.



# Chlorophyll a: Attains in Washington DC, James Polyhaline. Improving trends for spring James River in 3 of 5 segments. Degrading summer in lower James River.

Chlorophyll *a* Status

2012-2014 ATTAINMENT DEFICIT (%)		
Segment	Spring	Summer
ANATF_DC	N/A	0
POTTF_DC	N/A	0
JMSTF2	-1.83	-25.12
JMSTF1	-12.68	-45.42
JMSOH	-25.24	-13.00
JMSMH	-38.35	-61.25
JMSPH	0	-33.97

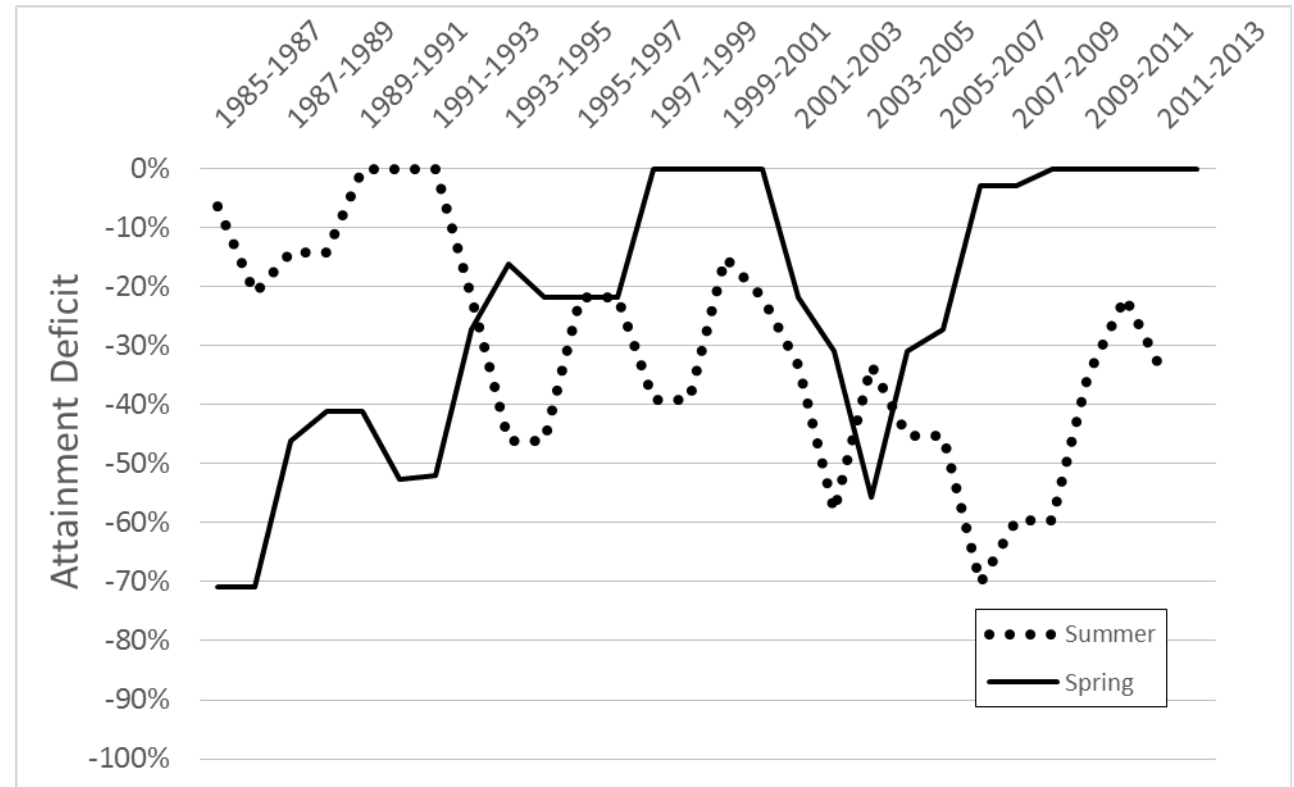
Chlorophyll *a* Trends in Deficit Measure  
(up = improving, down = degrading)

1985-2014 LONG-TERM TRENDS				
Segment	Spring		Summer	
	Attainment (A/S/N)	Trend	Attainment (A/S/N)	Trend
ANATF_DC	N/A		S	
POTTF_DC	N/A		S	
JMSTF2	N	↑	S	
JMSTF1	N	↑	S	
JMSOH	S		S	
JMSMH	S		S	↓
JMSPH	S	↑	S	↓

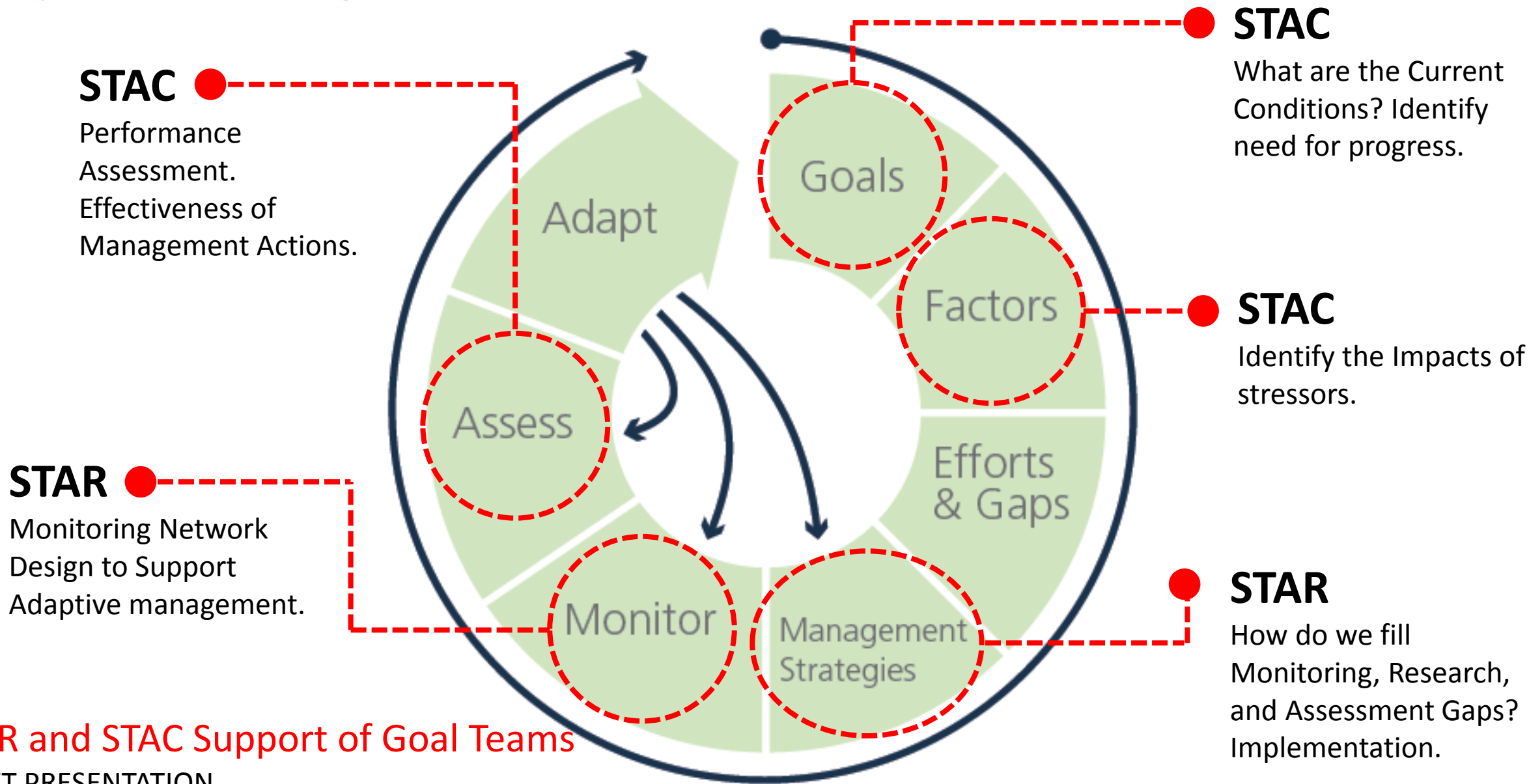


# Example of long term patterns of change in the attainment deficit for the James River Polyhaline chlorophyll *a* standards assessment.

- Improving conditions in spring have led to steady attainment of the Spring standard since the late 2000s.
- Degrading conditions occurred in summer season since the early 1990s, however, more recent years suggest a rebound from its worst condition.



**Indicators:** *A summary measure that provides information on the state of, or change in, the system that is being measured.*



STAR and STAC Support of Goal Teams

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# Indicator results support Adaptive Management

- The roll-up indicator gives a baywide summary picture.
- Maps of the indicator metrics provide diagnostics of spatial distribution of impairment for targeting monitoring and management actions.
- Trends in attainment deficit provide further feedback on regions sustaining their condition, direction of change, and rates of change over time.