Update on Indicators for Water Quality Standard Criteria Attainment and N, P, and SS Loads to the Bay

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Water Quality Goal Implementation Team Call

November 27, 2017

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Estimated Water Quality Standards Attained

Improve our capacity to monitor and assess the effects of the management actions being taken to implement the Chesapeake Bay Total Maximum Daily Load and improve water quality. Report annual progress being made in attaining water quality standards and trends in reducing nutrients and sediment in the watershed.

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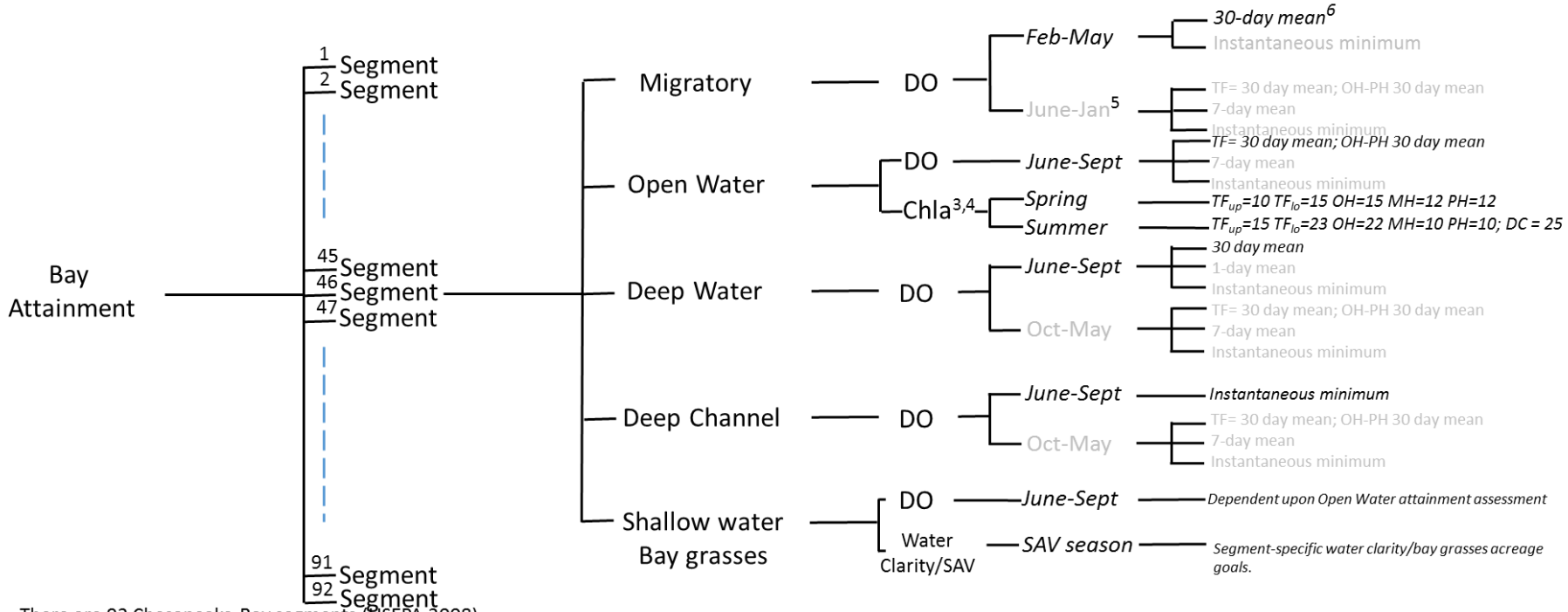
Water Quality Criteria Attainment Indicator

INDICATOR Water Quality Standards Attainment Assessment for Chesapeake Bay DO, Water Clarity and Chlorophyll a



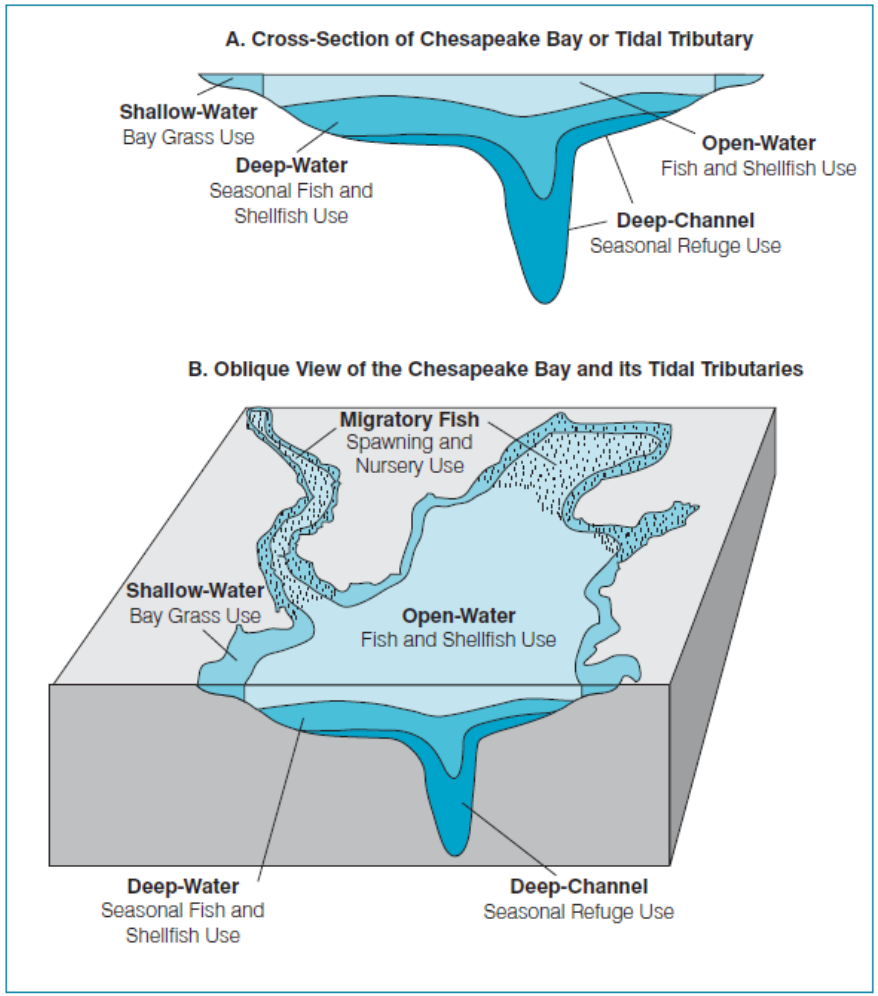
1. There are 92 Chesapeake Bay segments (USEPA 2008)
2. Designated uses are segment specific. Not all designated uses apply to each Chesapeake Bay segment.
3. Salinity zone-specific thresholds on the James River, VA: TF_{up}=Tidal Fresh upper segment, TF_{lo}=Tidal Fresh lower segment, OH=Oligohaline, MH=Mesohaline, PH=Polyhaline. DC= Washington District of Columbia.
4. The James River chlorophyll *a* criteria are assessed for attainment of a geometric mean measure of the water quality.
5. Gray text are elements of the full water quality standards attainment not included in the indicator calculations.
6. USEPA (2003) does not have a 30-day mean Feb-May DO threshold. The decision for the indicator used a 30-day mean of 6 mg/l as Feb-May DO threshold, same as the 7-day mean.

Water Quality Criteria Attainment Indicator

Single combined indicator

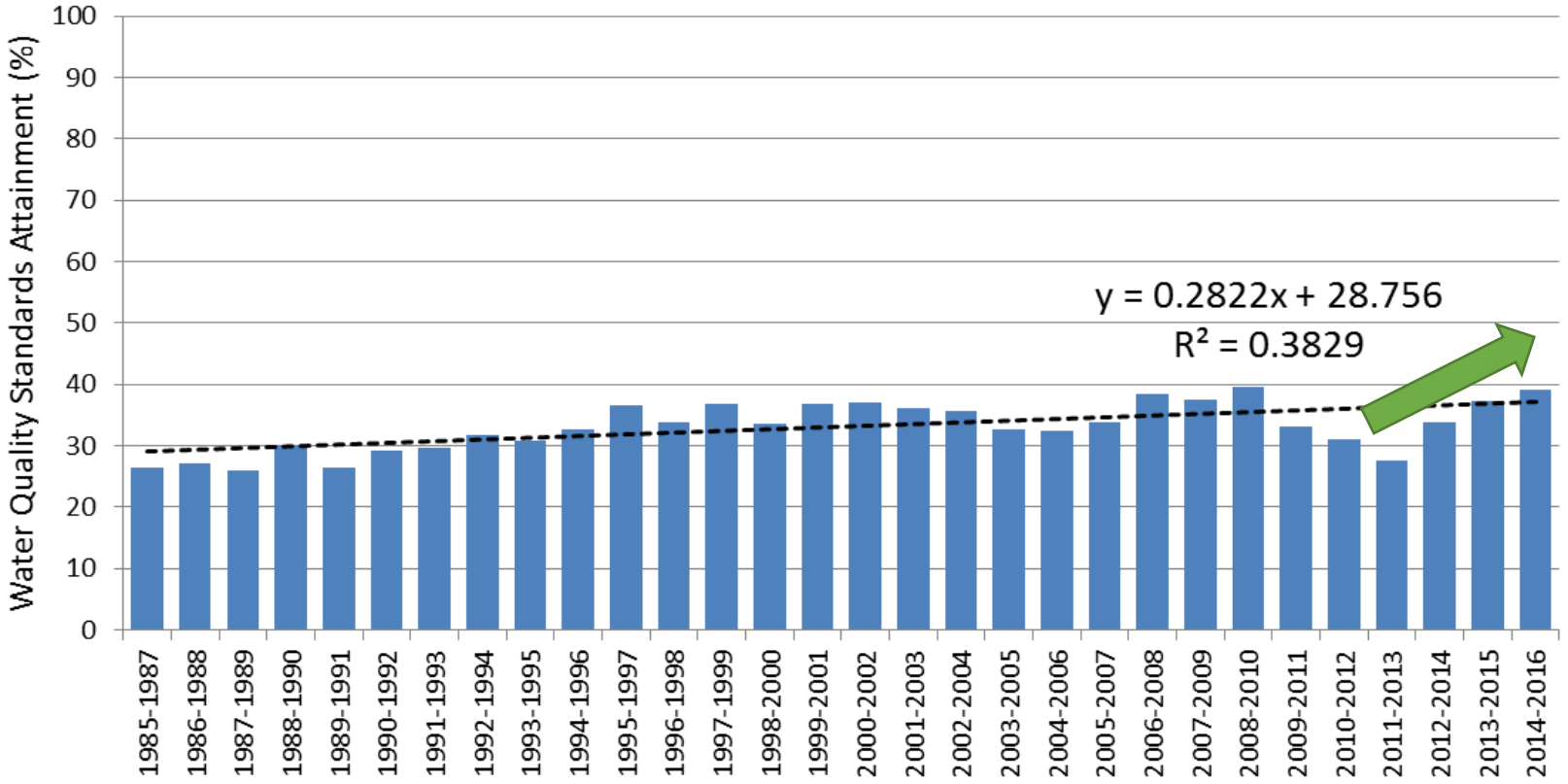
A Bay-wide fractional attainment indicator computed on a surface-area basis for all designated uses

Criteria	Designated Use	Threshold	Number of Applicable Segments
Dissolved Oxygen	Migratory Fish Spawning & Nursery (MSN)	30-day mean, February-May	73
	Open Water (OW)	30-day mean, June-September	92
	Deep Water (DW)	30-day mean, June-September	18
	Deep Channel (DC)	Instantaneous, June-September	10
Chlorophyll-a	Open Water (OW)	Chlorophyll-a concentrations	7
SAV and or Water Clarity	Shallow Water (SW)	Segment-specific water clarity and bay grass acreage goals	79 (91/104 split)



Water Quality Criteria Attainment Indicator

1985-2016



(pending revision with states data on water clarity acreage data)

Water Quality Criteria Attainment Indicator

1985-2016

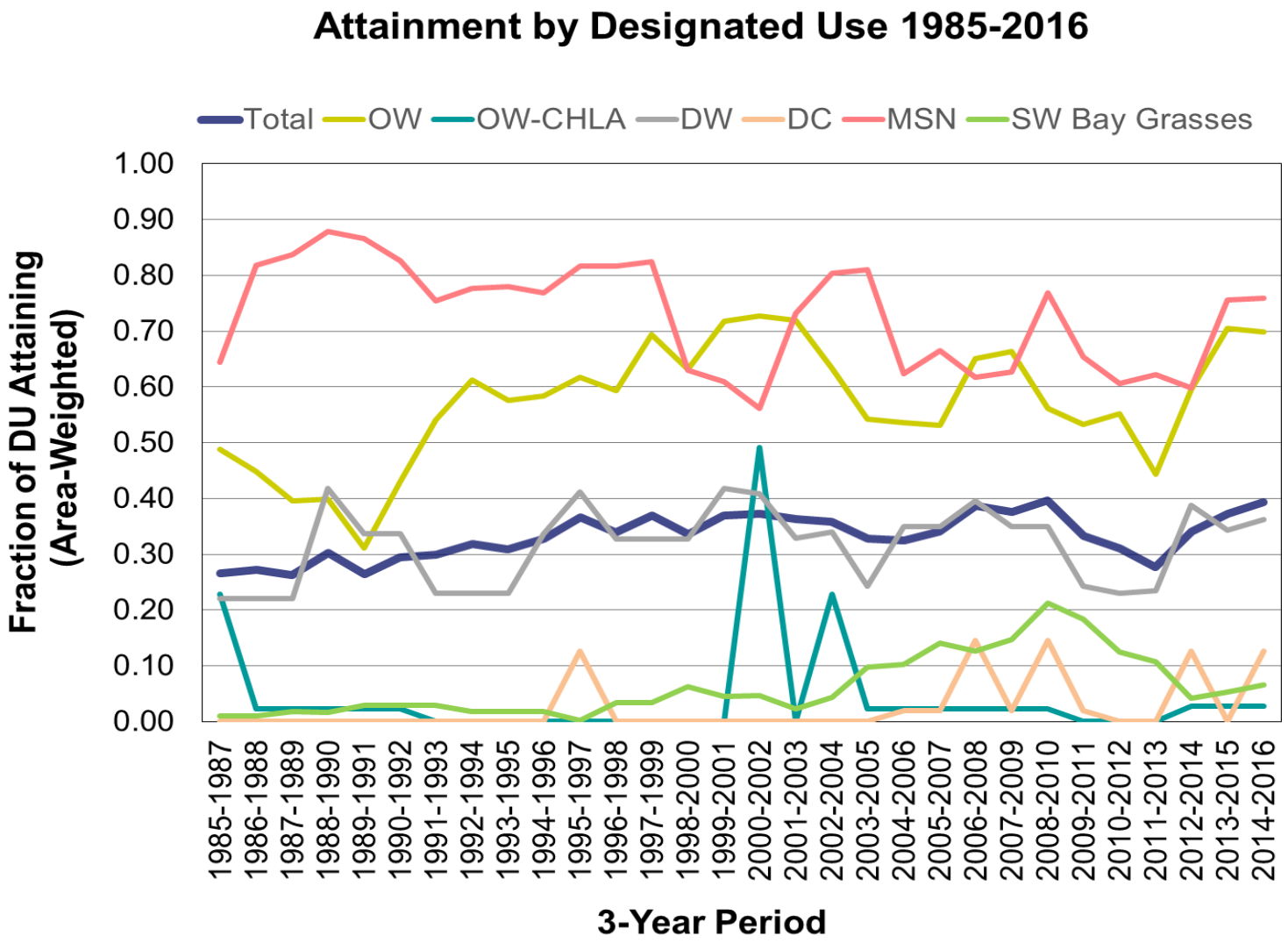
3-yr period	Attainment (%)
1985-1987	26.5
1986-1988	27.2
1987-1989	26.1
1988-1990	30.1
1989-1991	26.4
1990-1992	29.3
1991-1993	29.8
1992-1994	31.8
1993-1995	30.8
1994-1996	32.7
1995-1997	36.5
1996-1998	33.9
1997-1999	36.9
1998-2000	33.5
1999-2001	36.8

3-yr period	Attainment (%)
2000-2002	37.2 [5]
2001-2003	36.2
2002-2004	35.7
2003-2005	32.7
2004-2006	32.4
2005-2007	33.9
2006-2008	38.5 [3]
2007-2009	37.4 [4]
2008-2010	39.5 [1]
2009-2011	33.2
2010-2012	31.0
2011-2013	27.6
2012-2014	33.9
2013-2015	37.2 [5]
2014-2016	39.2 [2]

(pending revision with states data on water clarity acreage data)

Water Quality Criteria Attainment Indicator

By Designated Use



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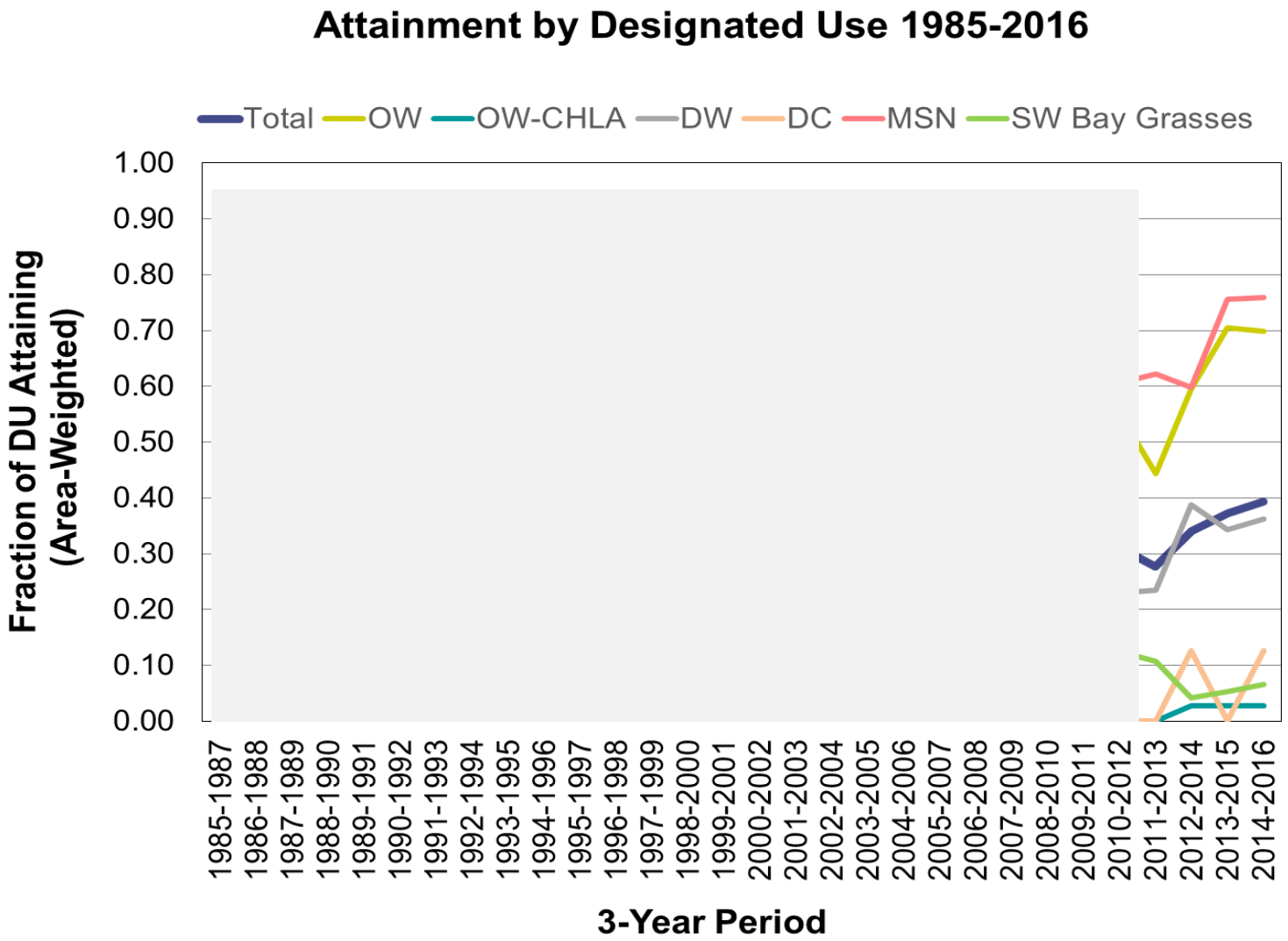

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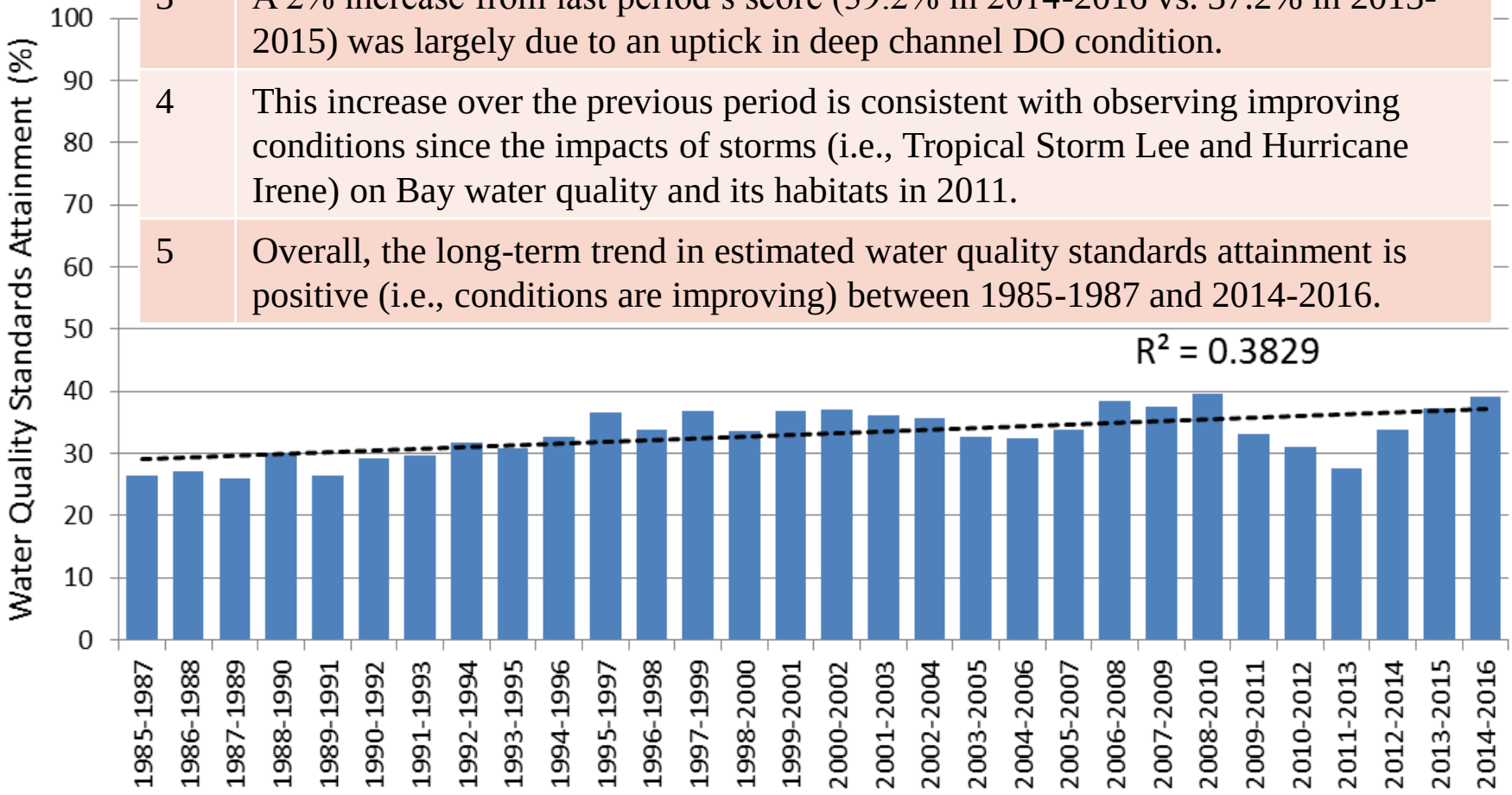
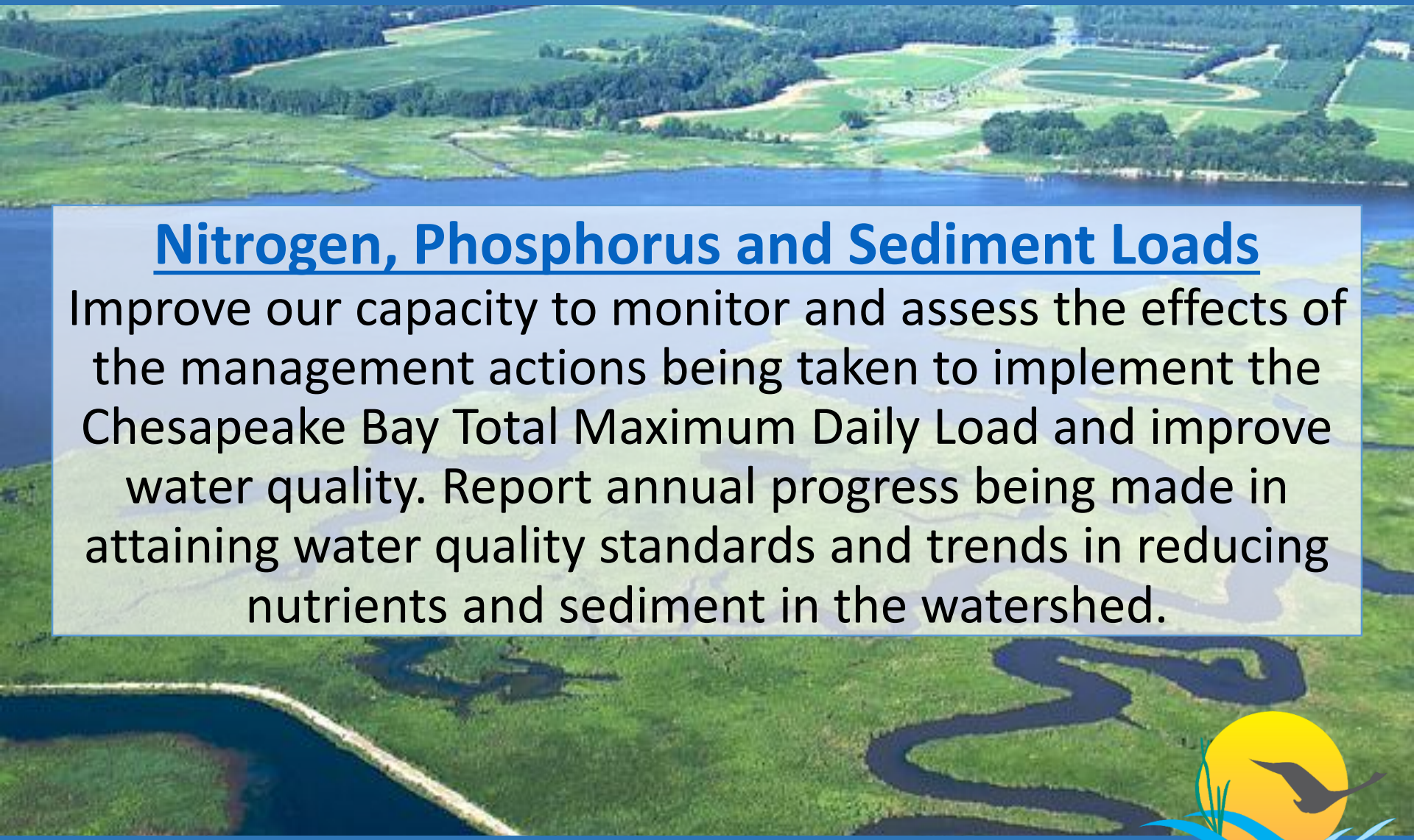
Water Quality Criteria Attainment Indicator

No.	Main Messages
1	Almost 40% of the tidal waters in Chesapeake Bay and the tidal tributaries are estimated to have achieved the combined water quality standards of dissolved oxygen, chlorophyll-a, and SAV/water clarity between 2014 and 2016.
2	This 2014-2016 assessment period scores the 2nd highest since 1985.
3	A 2% increase from last period's score (39.2% in 2014-2016 vs. 37.2% in 2013-2015) was largely due to an uptick in deep channel DO condition.
4	This increase over the previous period is consistent with observing improving conditions since the impacts of storms (i.e., Tropical Storm Lee and Hurricane Irene) on Bay water quality and its habitats in 2011.
5	Overall, the long-term trend in estimated water quality standards attainment is positive (i.e., conditions are improving) between 1985-1987 and 2014-2016.





Nitrogen, Phosphorus and Sediment Loads

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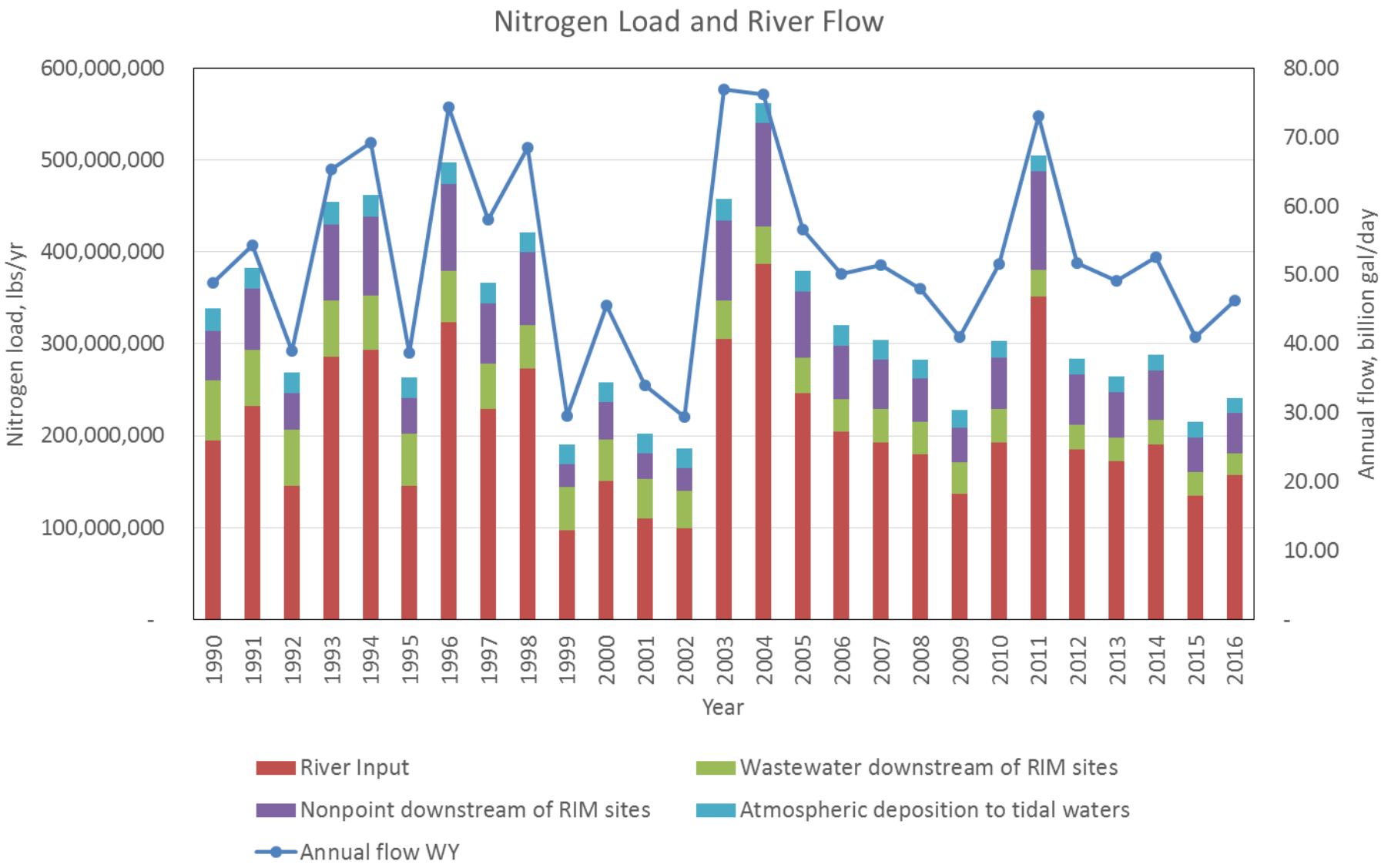
Nitrogen, Phosphorus, and Suspended Sediment Loads to the Bay

	Riverflow (billion gal/d)	Nitrogen (million lbs/yr)	Phosphorus (million lbs/yr)	Sediment (million tons/yr)
2016 value	46.3	241	13.6	2.5
2015 value	41.0	215	10.1	1.6
2016 value minus 2015 value	+5.2	+26	+3.5	+0.9
2016 value minus long-term average	-6.3	-90	-6.2	-2.4

2016 loads higher than 2015 (likely due to higher flow)
2016 loads lower than long-term average

Nitrogen, Phosphorus, and Suspended Sediment Loads to the Bay



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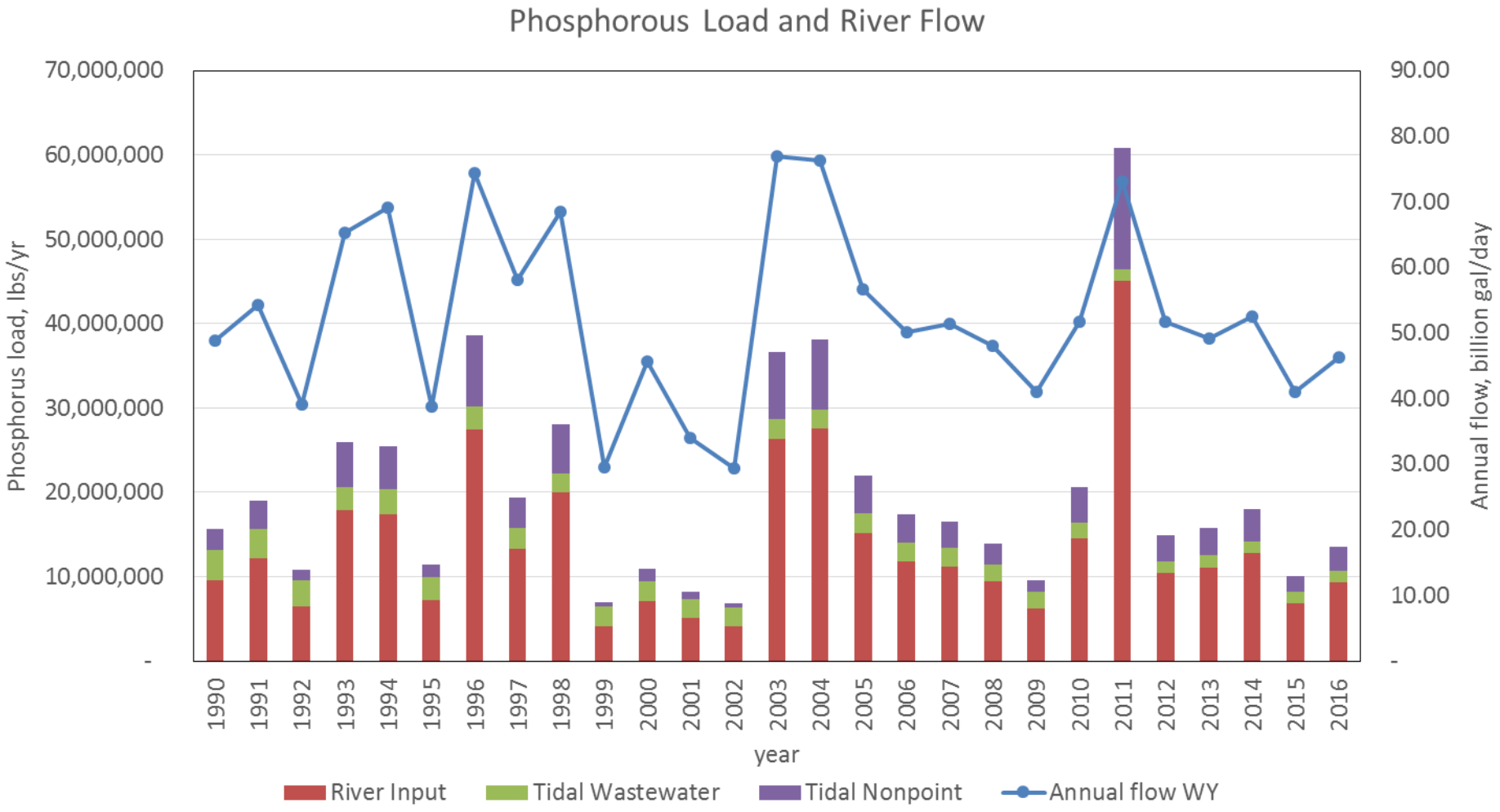

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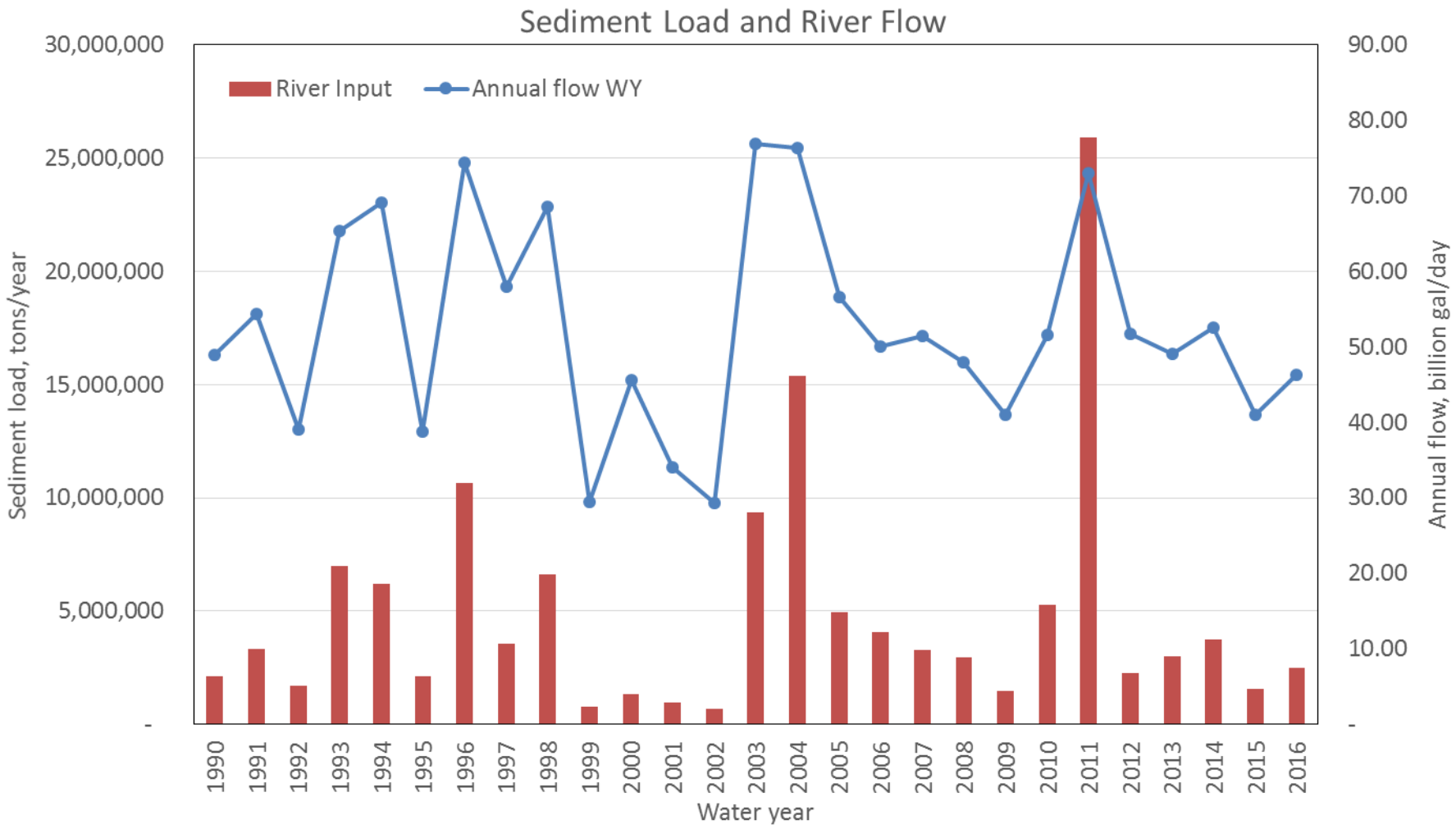

- Results will be updated once water clarity acreage data are received from MD and VA.
- Results will be released in the Bay Barometer.
- Results will be on *ChesapeakeProgress*.

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