

# CHESAPEAKE WATER ENVIRONMENT ASSOCIATION

## *Beyond Nutrients: Case Studies and Tools for Addressing TMDLs*

June 8, 2016

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U.S. EPA Chesapeake Bay Program Office

# INDICATORS OF IMPROVING ECOSYSTEM HEALTH WE ARE MAKING PROGRESS

- Blue Crab population
- Bay Grasses
- Water Clarity
- WQ Standards Attainment
- Reducing Pollution



# Chesapeake Bay Report Card 2015



*University of Maryland Center for Environmental Science*



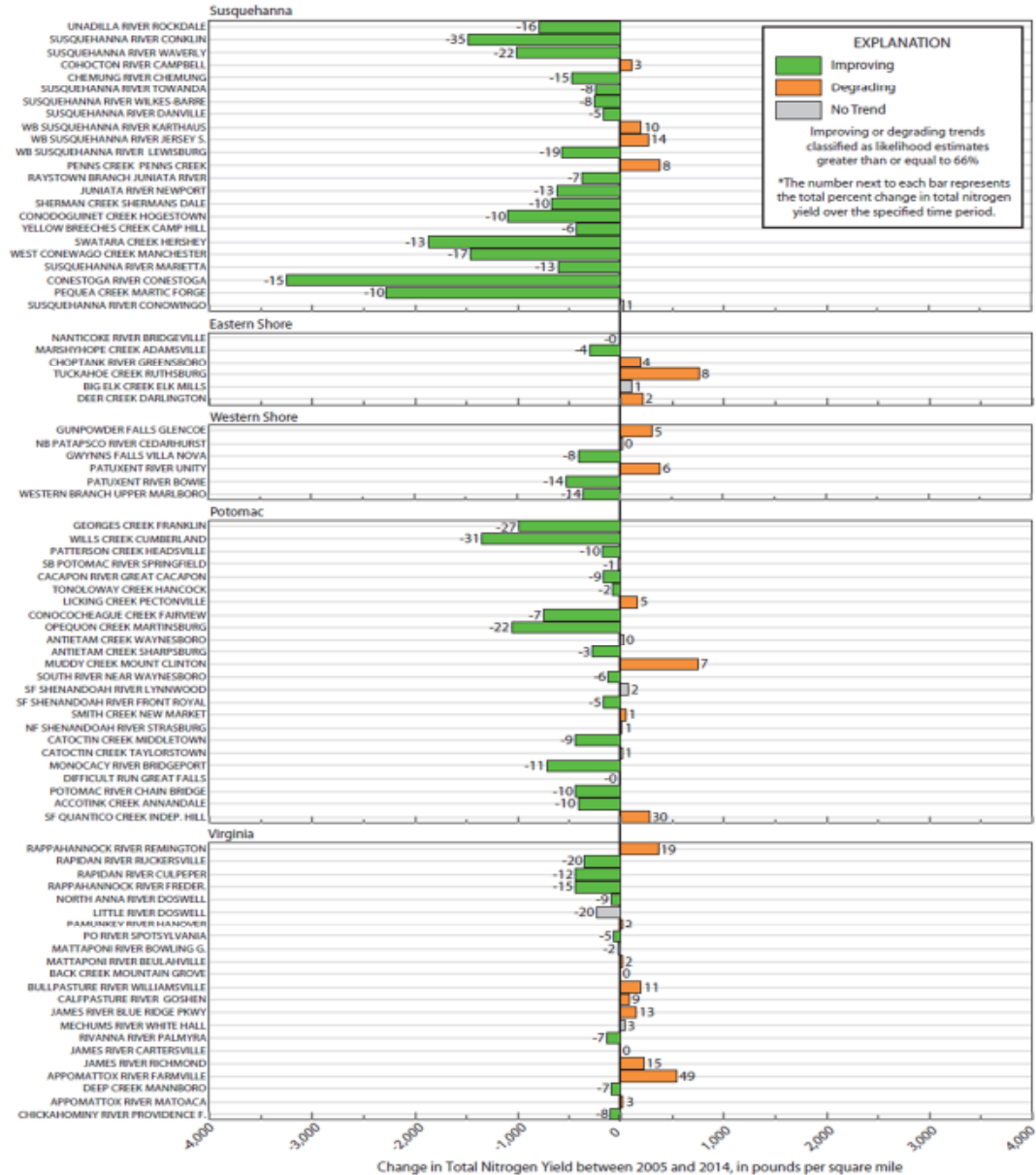
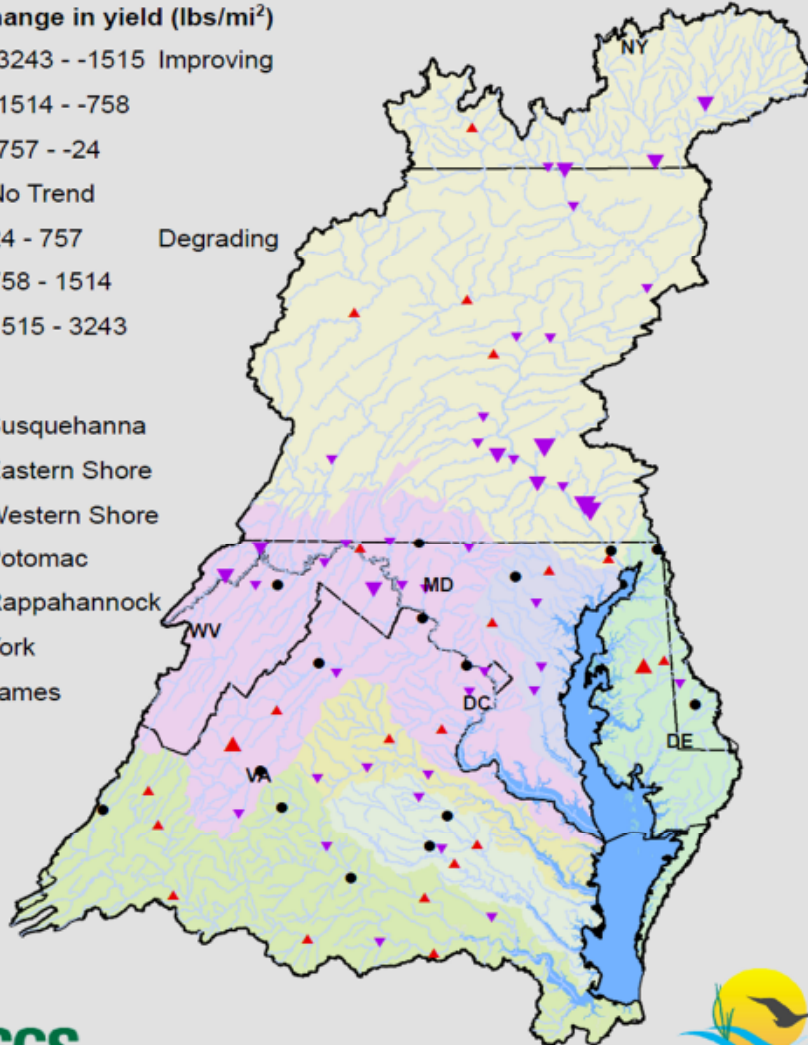
# WE ARE SEEING DECREASING TRENDS IN NITROGEN LOADS IN STREAMS AND RIVERS THROUGHOUT THE WATERSHED...

## Trend in Total Nitrogen Flow-Normalized Yield, 2005-2014

Total change in yield (lbs/mi<sup>2</sup>)

- ▼ -3243 - -1515 Improving
- ▼ -1514 - -758
- ▼ -757 - -24
- No Trend
- ▲ 24 - 757 Degrading
- ▲ 758 - 1514
- ▲ 1515 - 3243

- Susquehanna
- Eastern Shore
- Western Shore
- Potomac
- Rappahannock
- York
- James



Prepared on 10/20/15



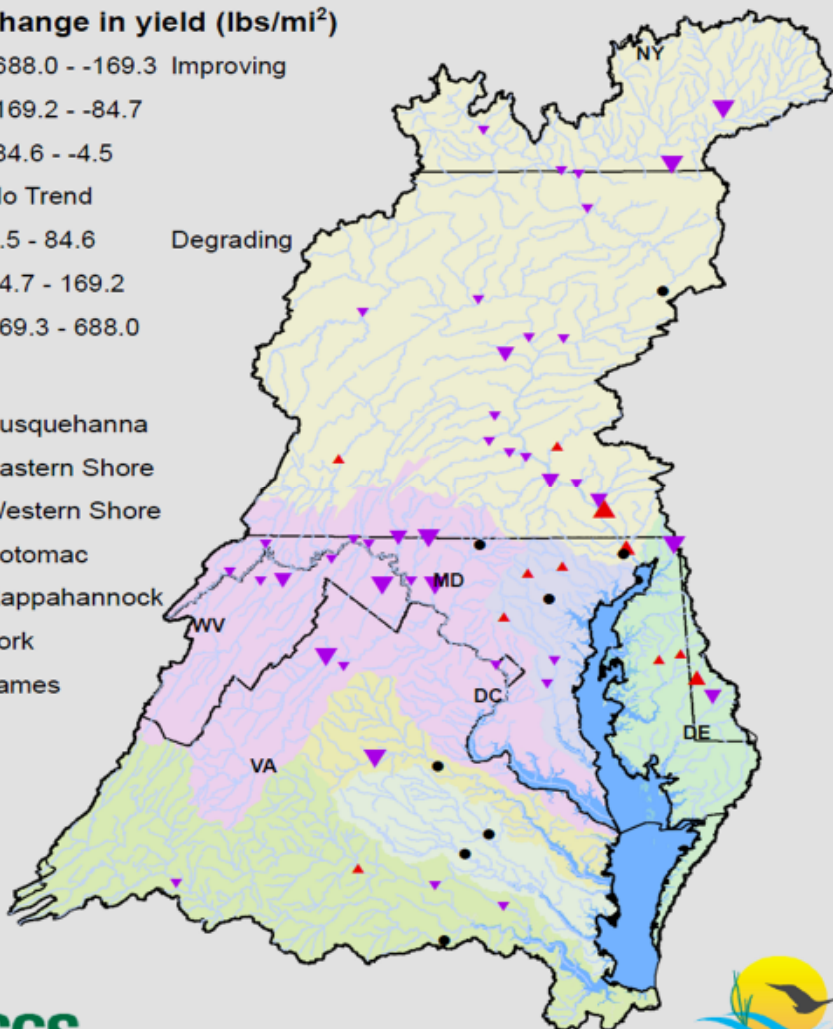
# ...AS WELL AS DECREASING TRENDS IN PHOSPHORUS LOADS WITH THE EXCEPTION OF THE SUSQUEHANNA @ CONOWINGO

## Trend in Total Phosphorus Flow-Normalized Yield, 2005-2014

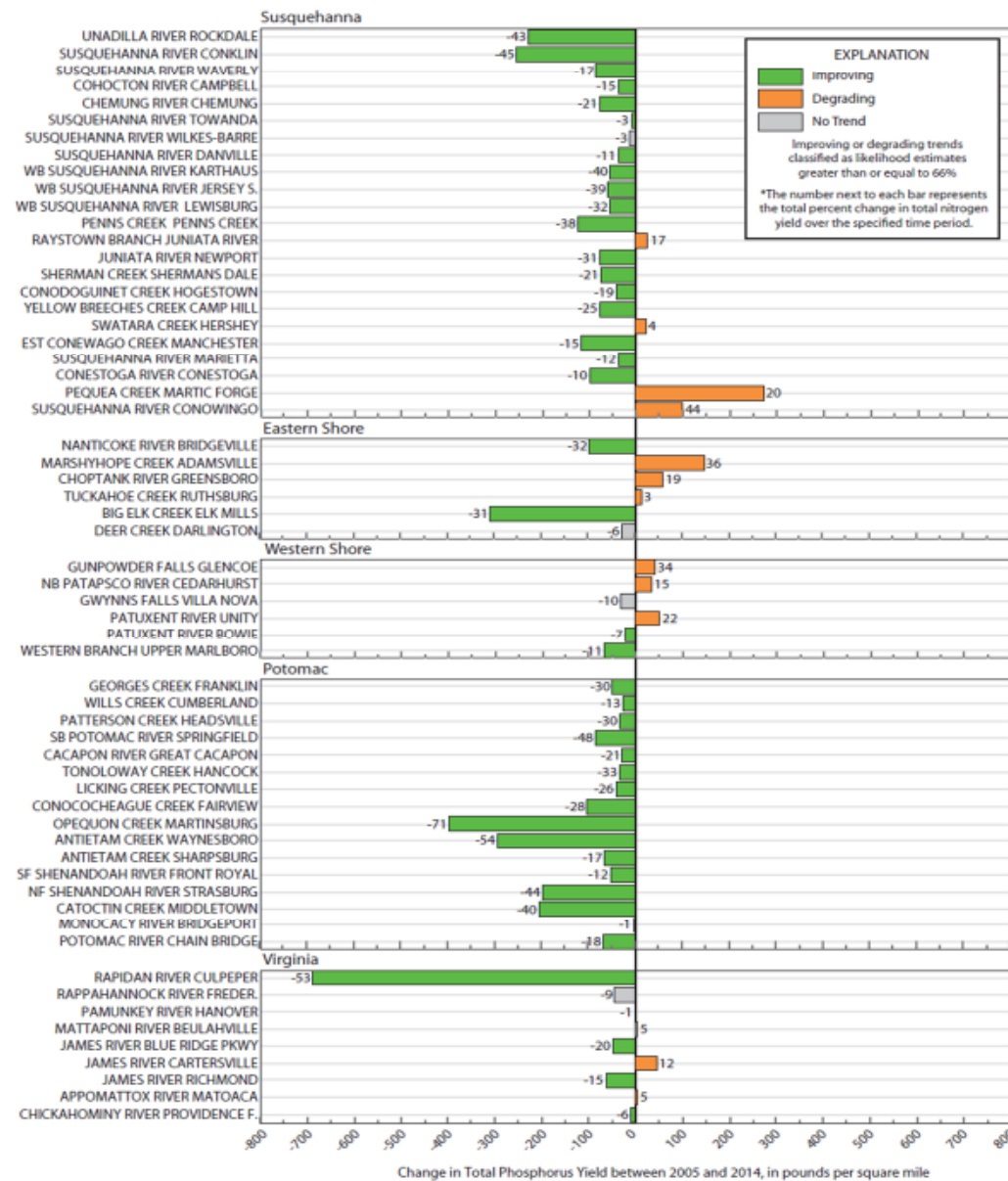
Total change in yield (lbs/mi<sup>2</sup>)

- ▼ -688.0 - -169.3 Improving
- ▼ -169.2 - -84.7
- ▼ -84.6 - -4.5
- No Trend
- ▲ 4.5 - 84.6 Degrading
- ▲ 84.7 - 169.2
- ▲ 169.3 - 688.0

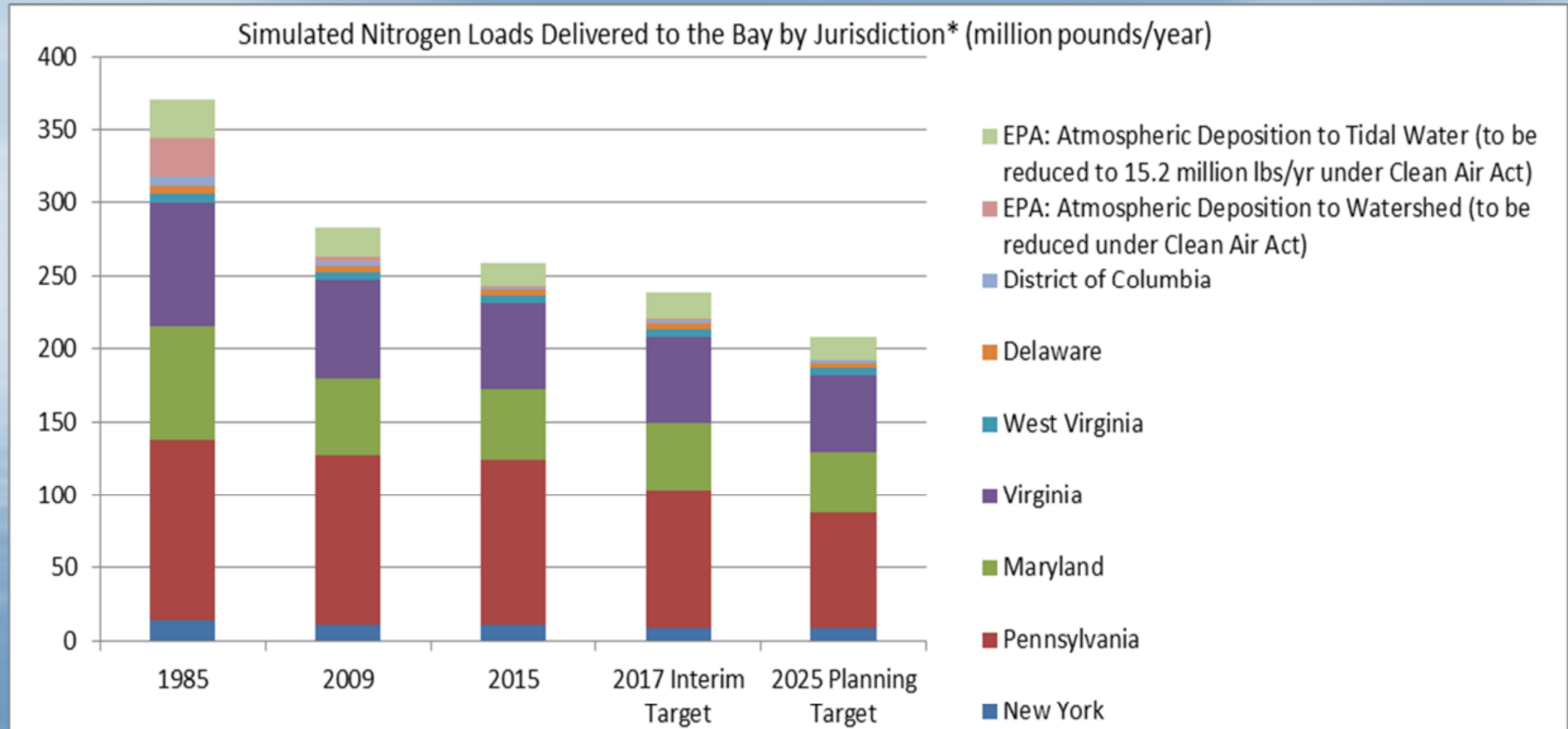
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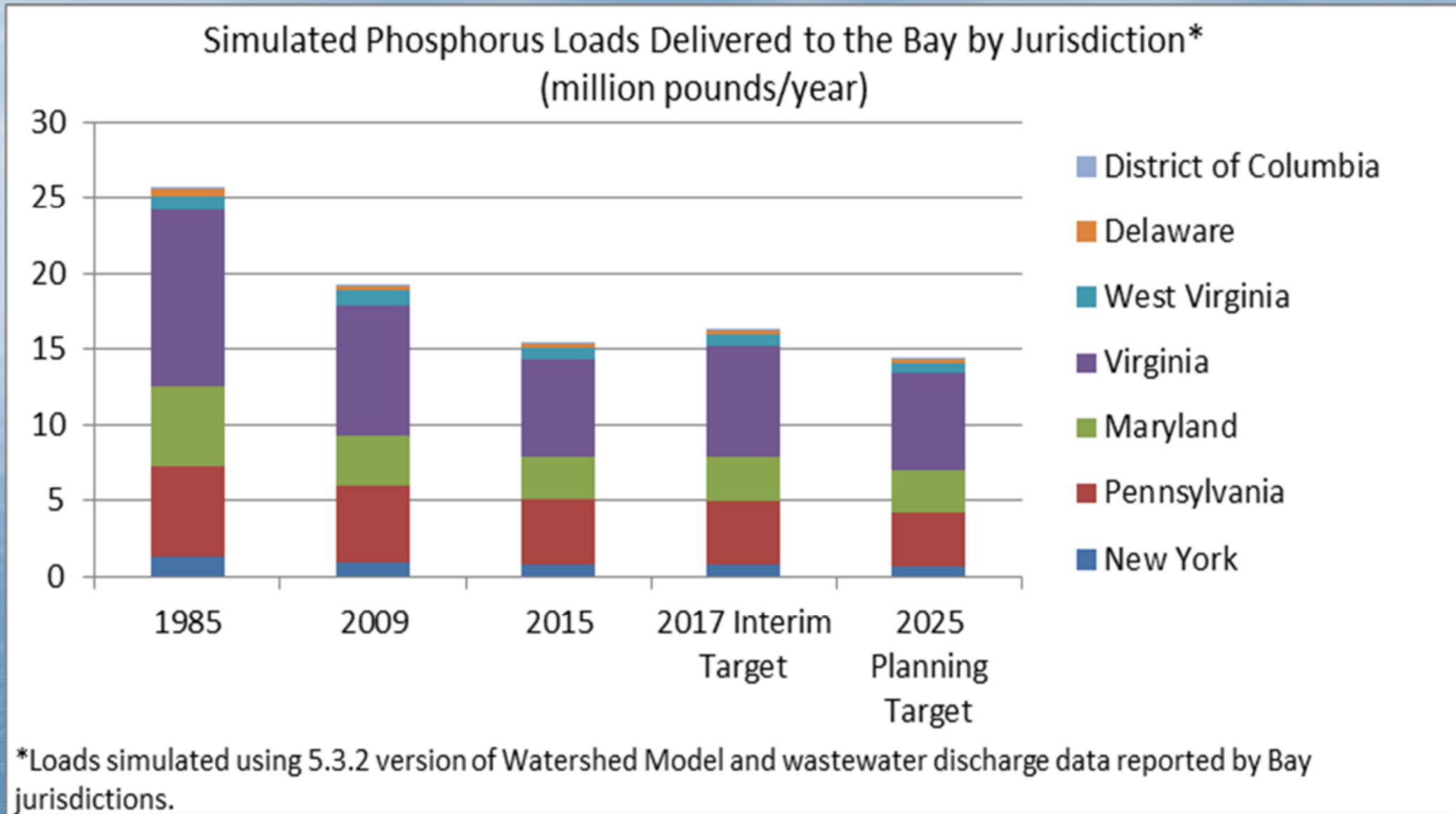


# NITROGEN PROGRESS AND GOALS BY JURISDICTION

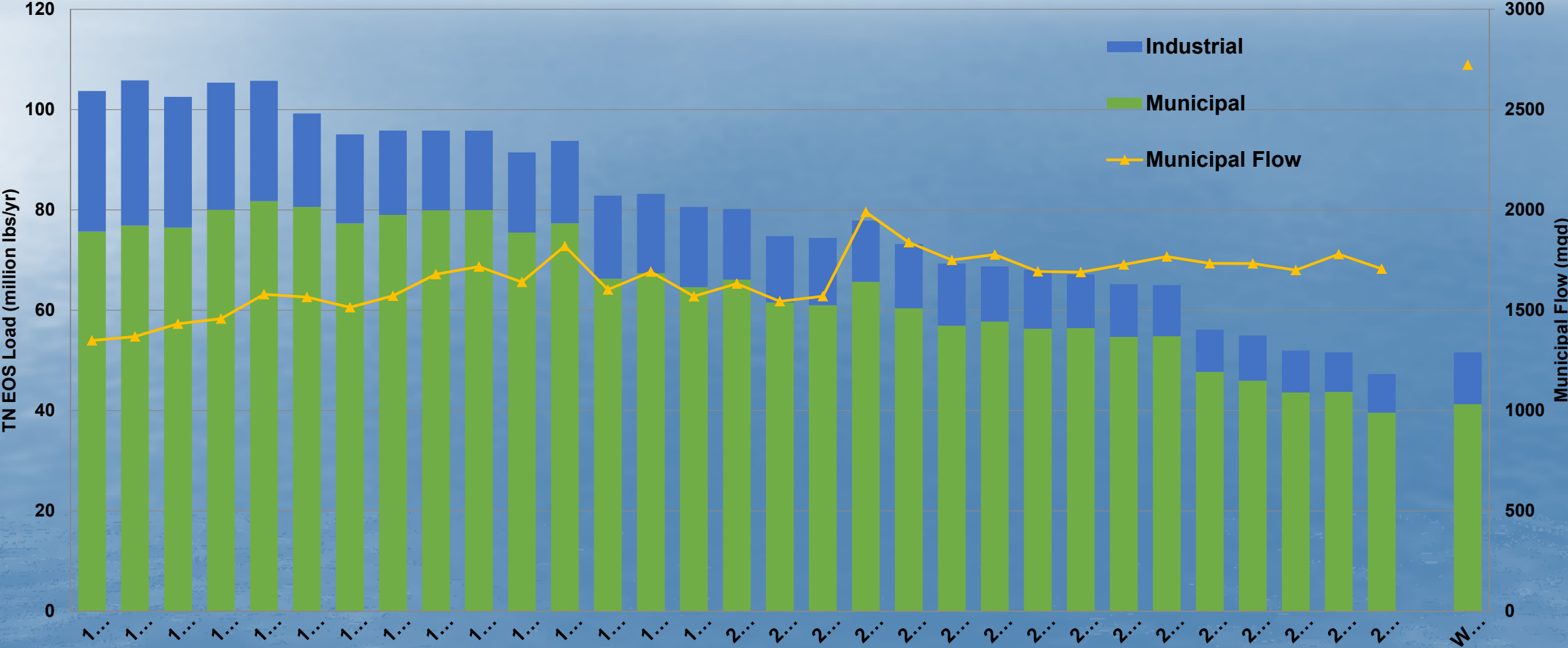


\*Loads simulated using 5.3.2 version of Watershed Model and wastewater discharge data reported by Bay jurisdictions..

# PHOSPHORUS PROGRESS AND GOALS BY JURISDICTION

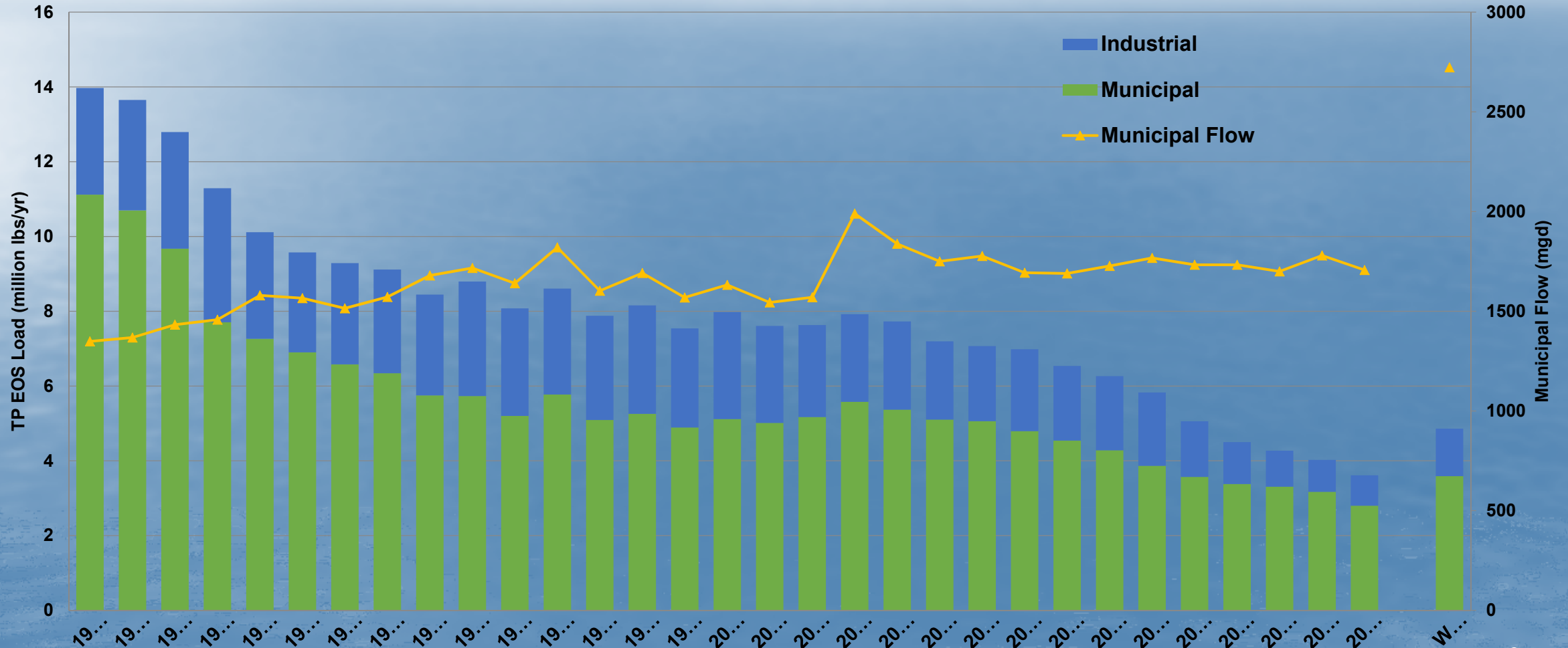


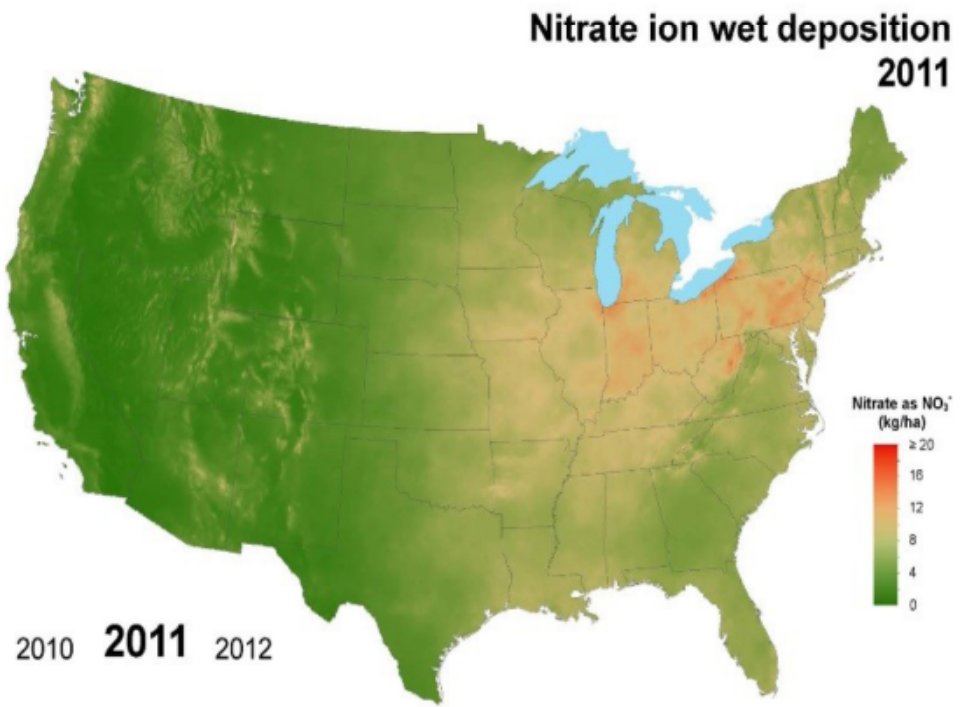
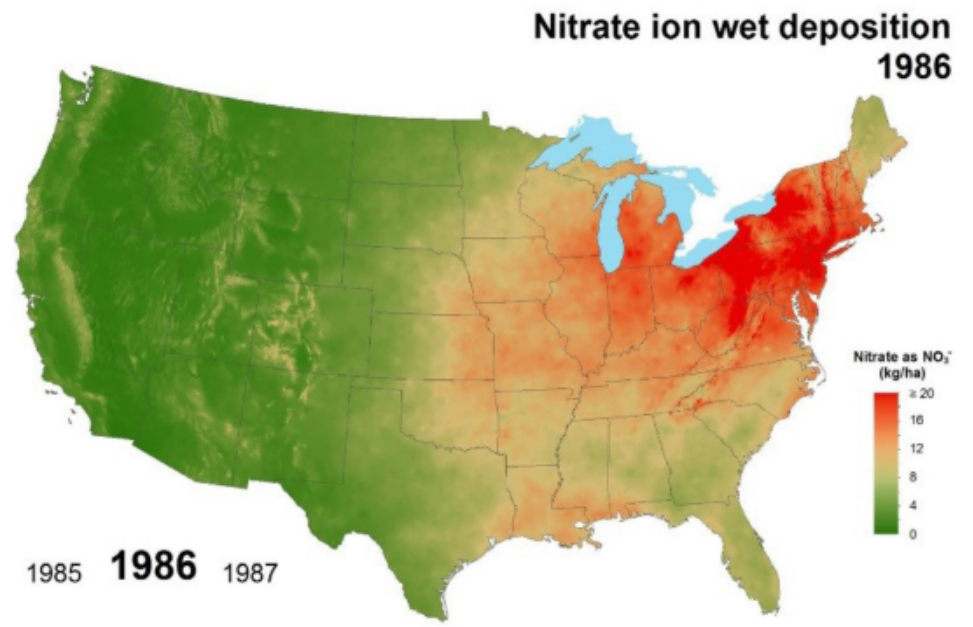
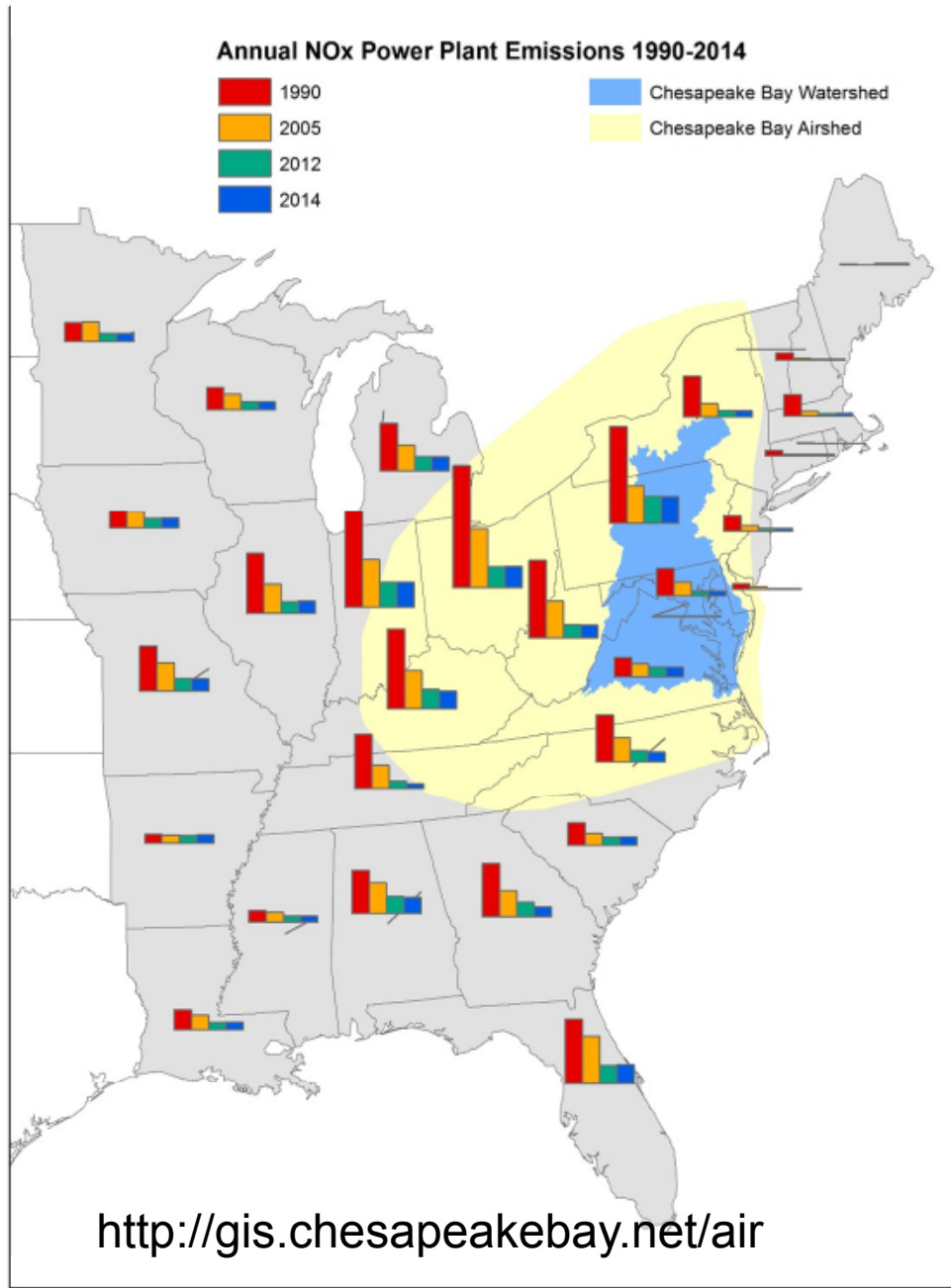
# DISCHARGED TOTAL NITROGEN LOADS FROM 472 SIGNIFICANT MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT FACILITIES VS. MUNICIPAL FLOW





# DISCHARGED TOTAL PHOSPHORUS LOADS FROM 472 SIGNIFICANT MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT FACILITIES VS. MUNICIPAL FLOW



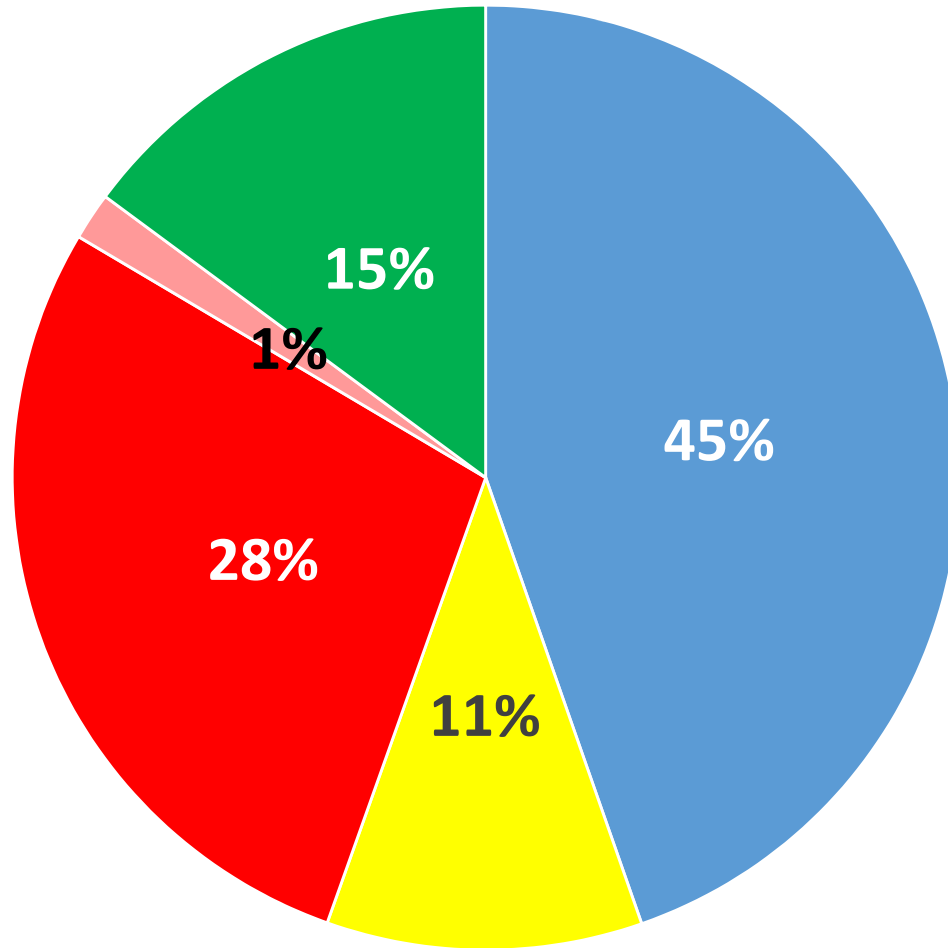


# Chesapeake Bay Watershed Nitrogen Loads

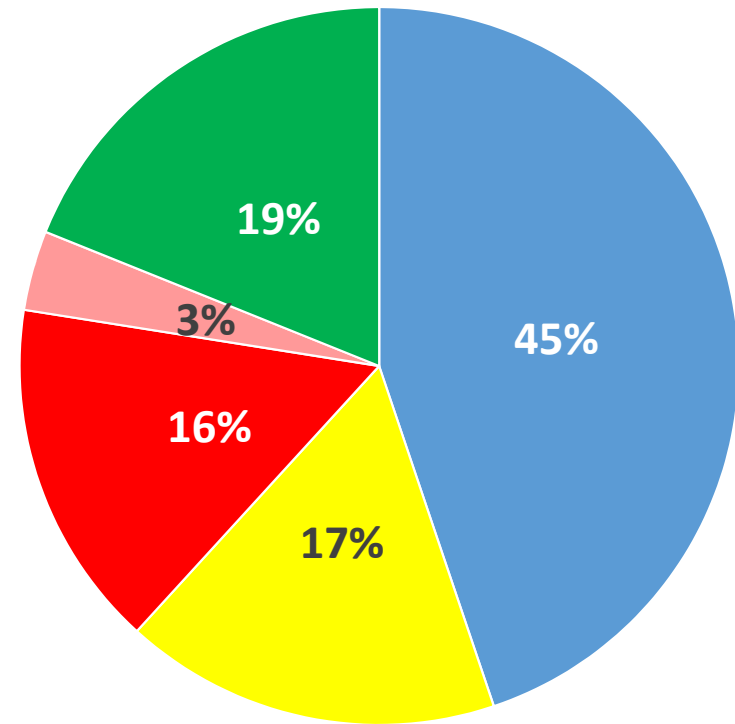
■ Agriculture ■ Urban Runoff ■ Wastewater+CSO ■ Septic ■ Forest

Where did the Nitrogen reductions come from?

Agriculture	39%
Wastewater	59%
Forest	2%



**1985**

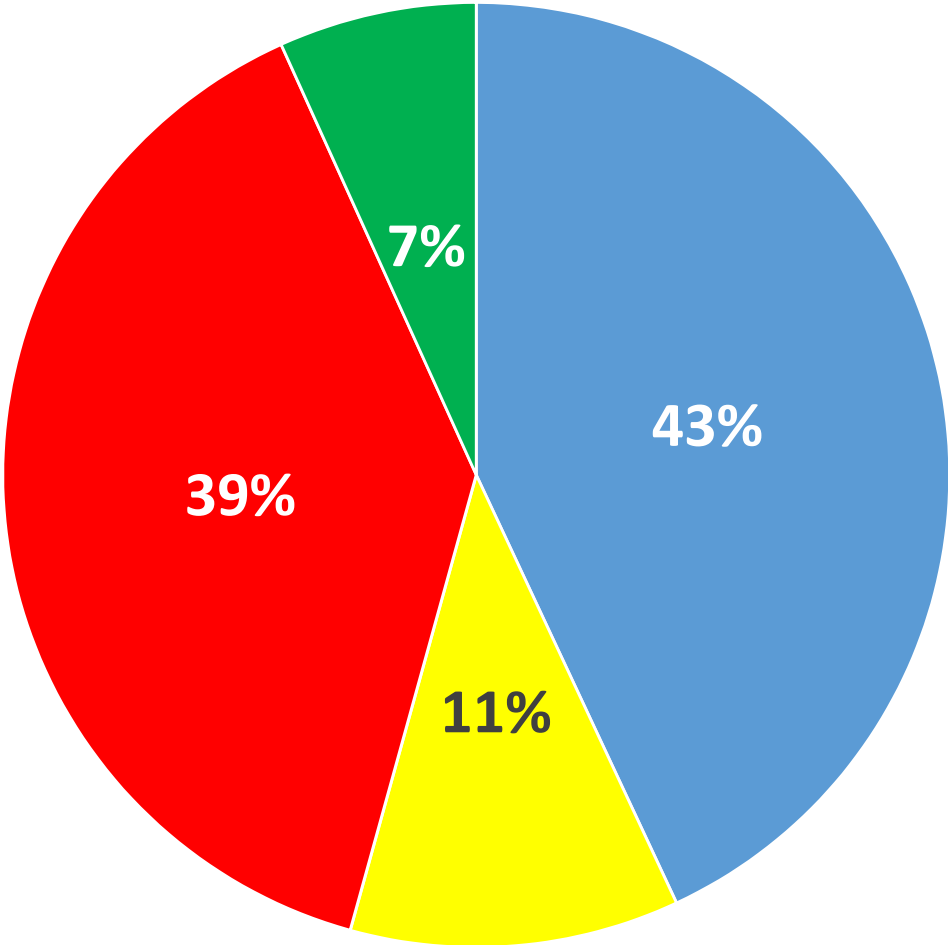


**2015**

# Chesapeake Bay Watershed Phosphorus Loads

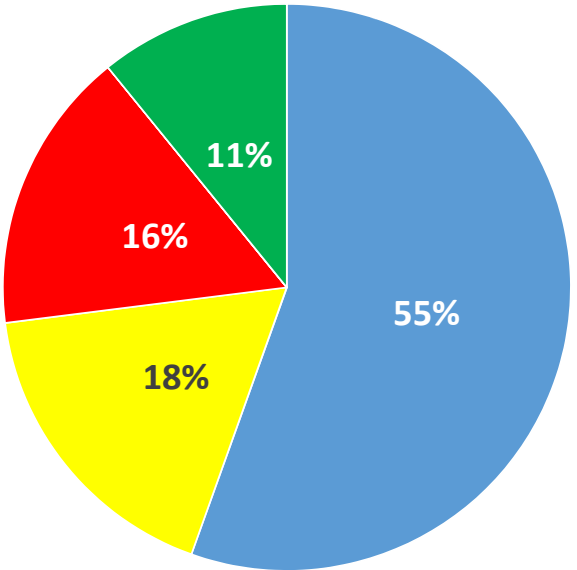
■ Agriculture    
 ■ Urban Runoff    
 ■ Wastewater+CSO    
 ■ Forest

Where did the Phosphorus reductions come from?



**1985**

Agriculture	24%
Urban Runoff	2%
Wastewater	73%
Forest	1%



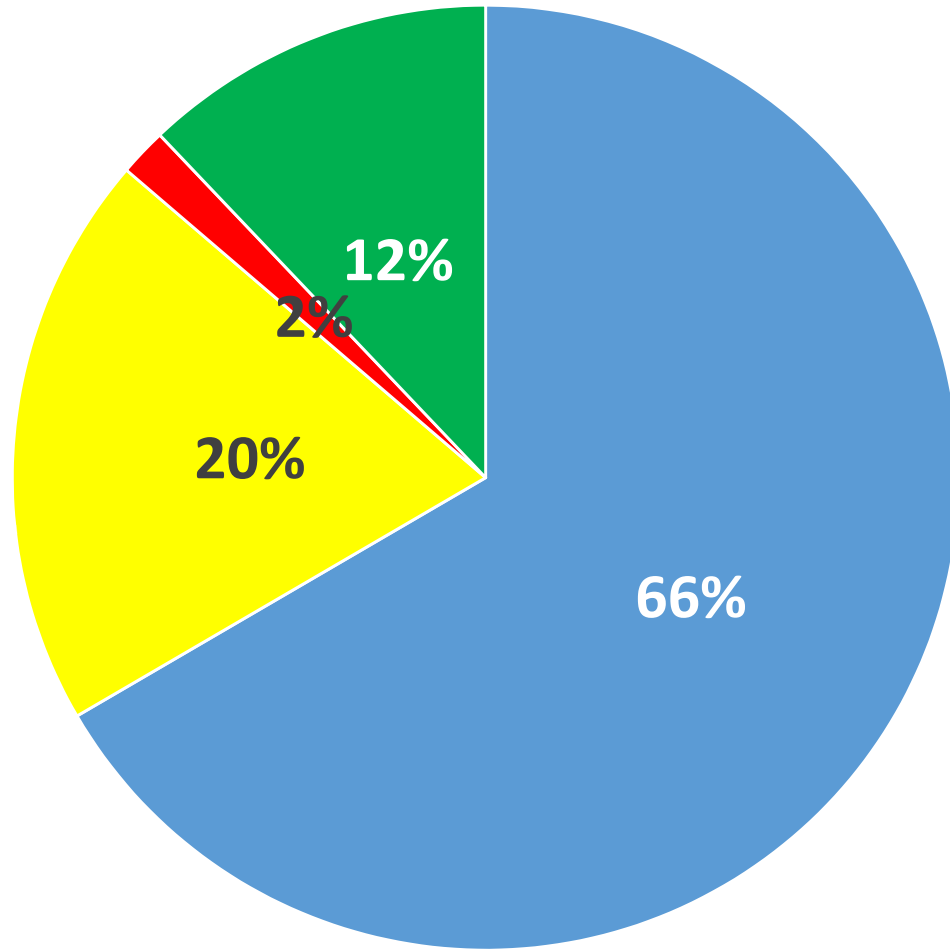
**2015**

# Chesapeake Bay Watershed Sediment Loads

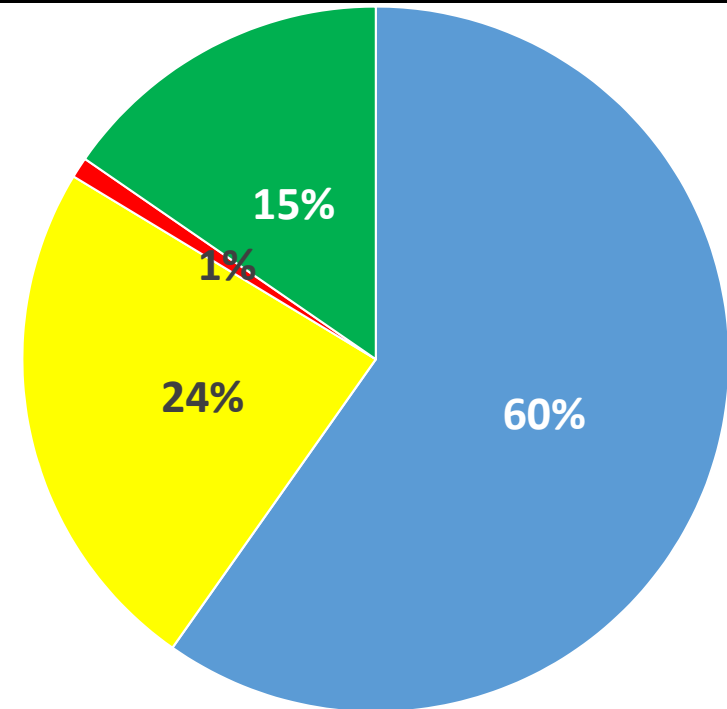
■ Agriculture    ■ Urban Runoff    ■ Wastewater+CSO    ■ Forest

Where did the Sediment reductions come from?

Agriculture	86%
Urban Runoff	7%
Wastewater	4%
Forest	2%



**1985**



**2015**

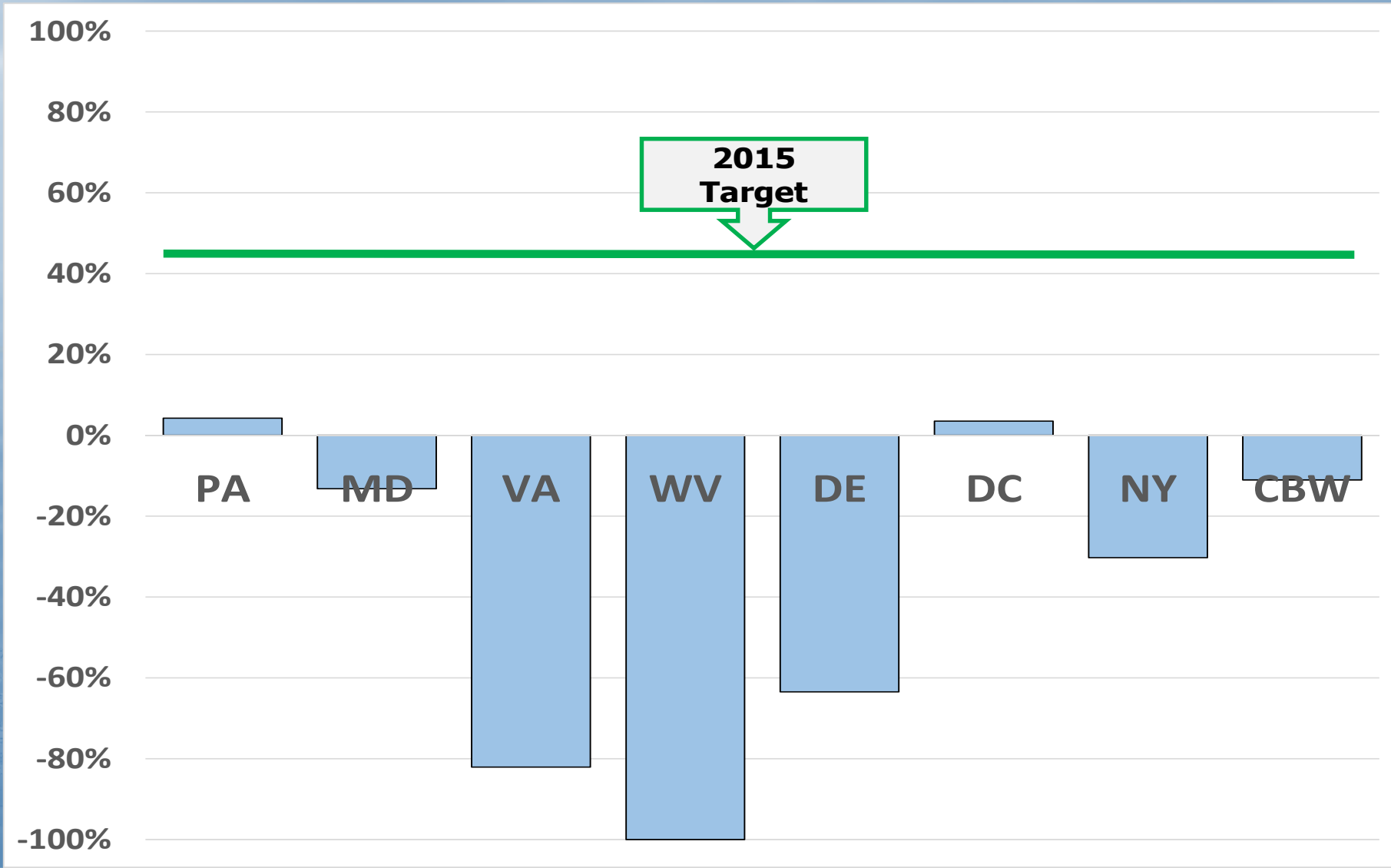
# PHASE II WIP COMMITMENTS: LOAD REDUCTIONS FROM 2009 TO 2025

	% Reduction in Statewide Loads			% Reduction in Urban Loads			% Total Load Reductions Attributable to Urban Sector		
	N	P	TSS	N	P	TSS	N	P	TSS
Delaware	26%	31%	27%	13%	12%	5%	4%	2%	5%
D.C.	19%	-68%	5%	13%	22%	16%	5%	N.A.	255%
Maryland	21%	20%	16%	24%	28%	29%	21%	30%	66%
New York	13%	30%	25%	8%	20%	10%	7%	9%	12%
Pennsylvania	30%	29%	28%	41%	45%	50%	20%	24%	39%
Virginia	18%	25%	24%	13%	21%	30%	10%	14%	23%
West Virginia	8%	31%	32%	3%	44%	50%	6%	18%	37%

Negative values indicate increases in loads from 2009 to Phase II WIP planning targets, typically due to increases in wastewater treatment flow up to design capacity.

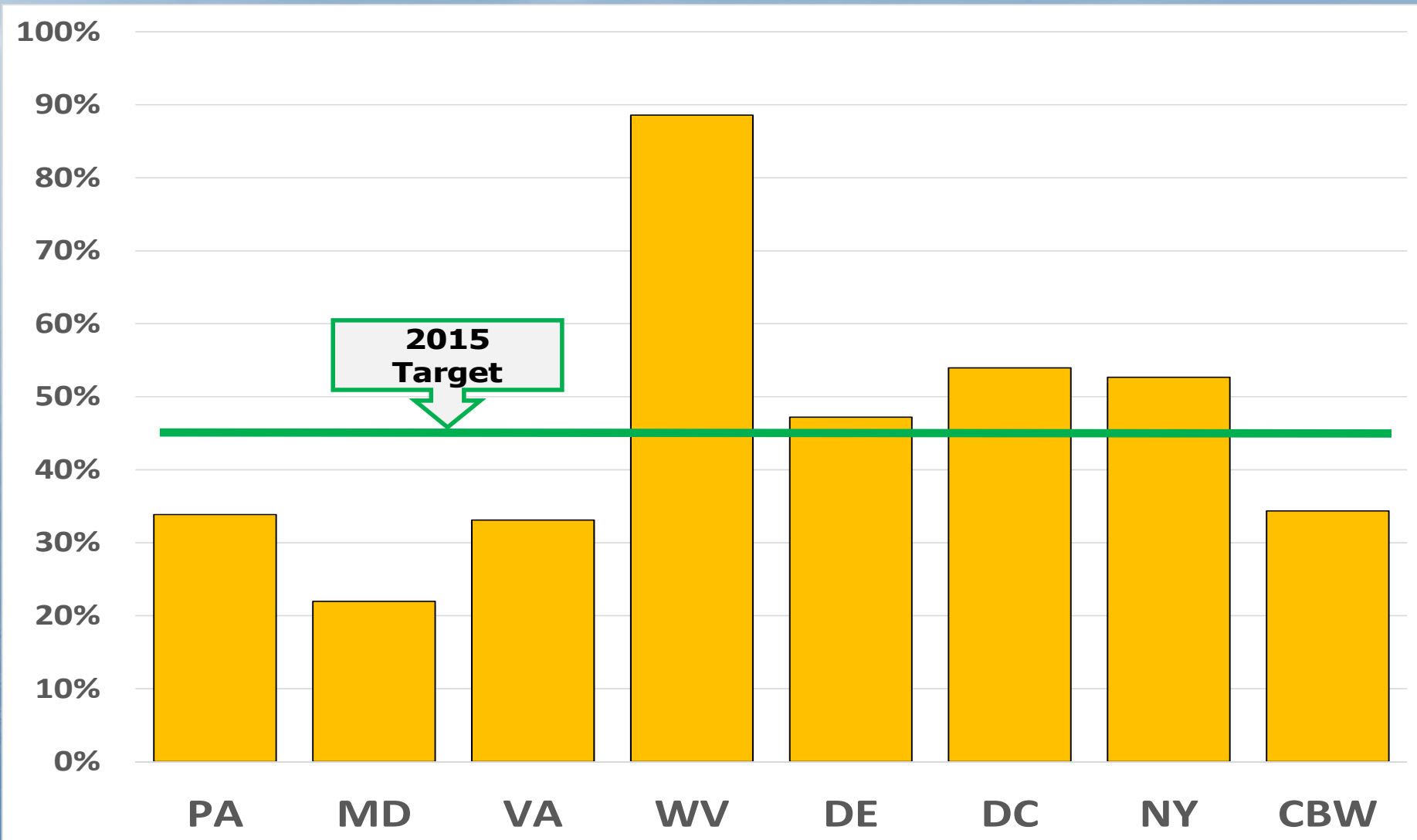
# Percent of Urban Goal Achieved for Nitrogen

(2015 target = 45% of 2009-2025 load reduction)



# Percent of Urban Goal Achieved for Phosphorus

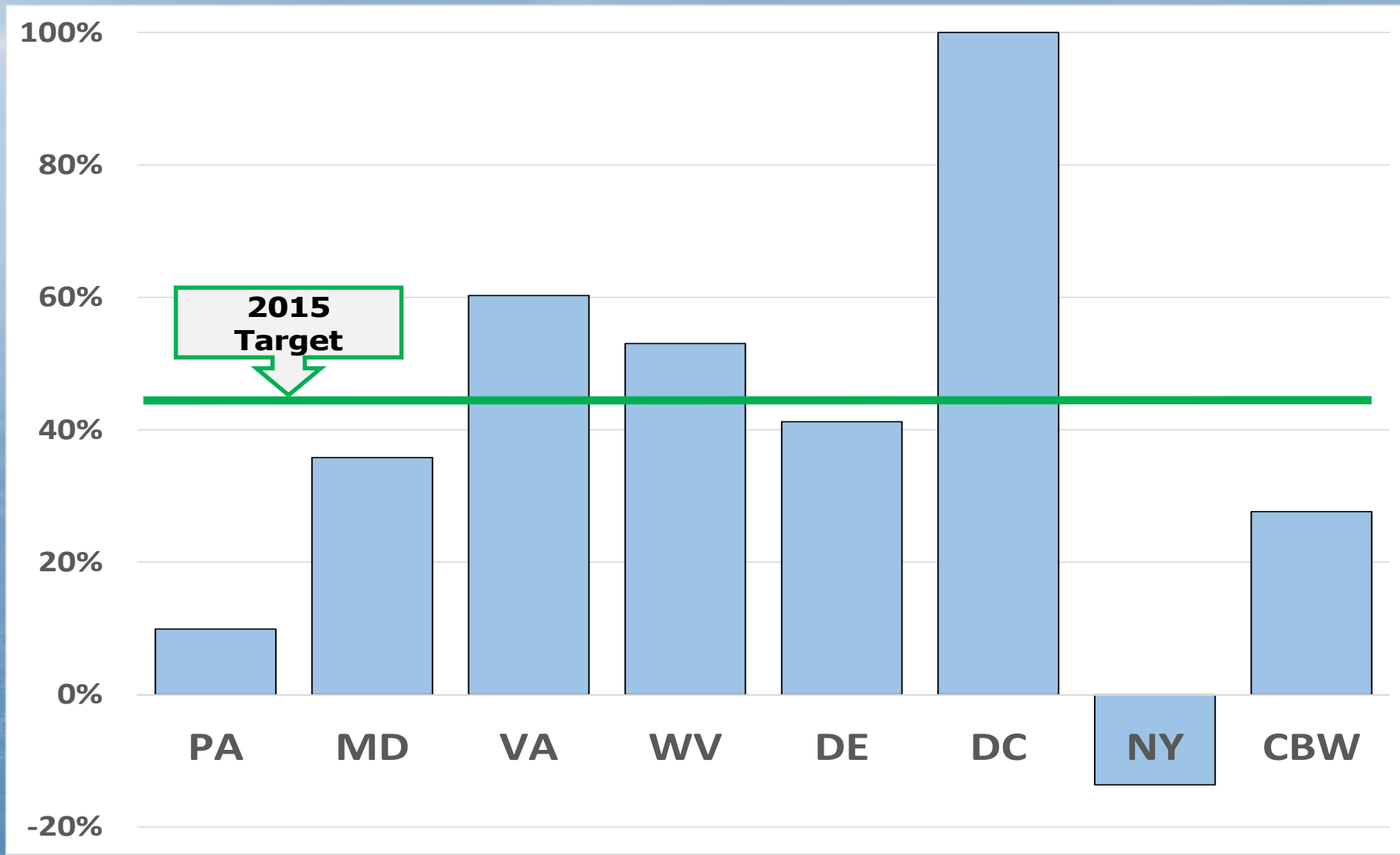
(2015 target = 45% of 2009-2025 load reduction, all sources)





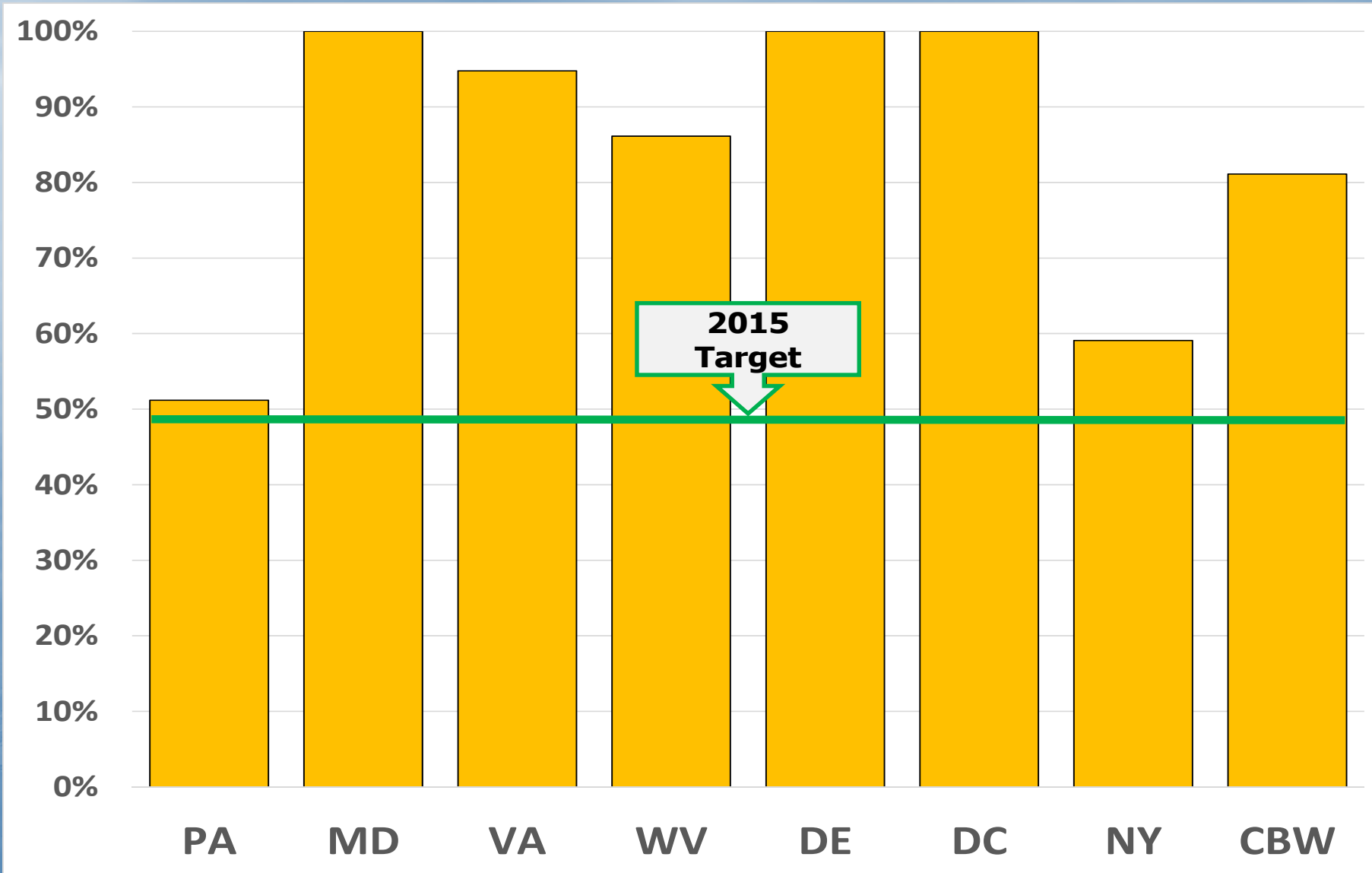
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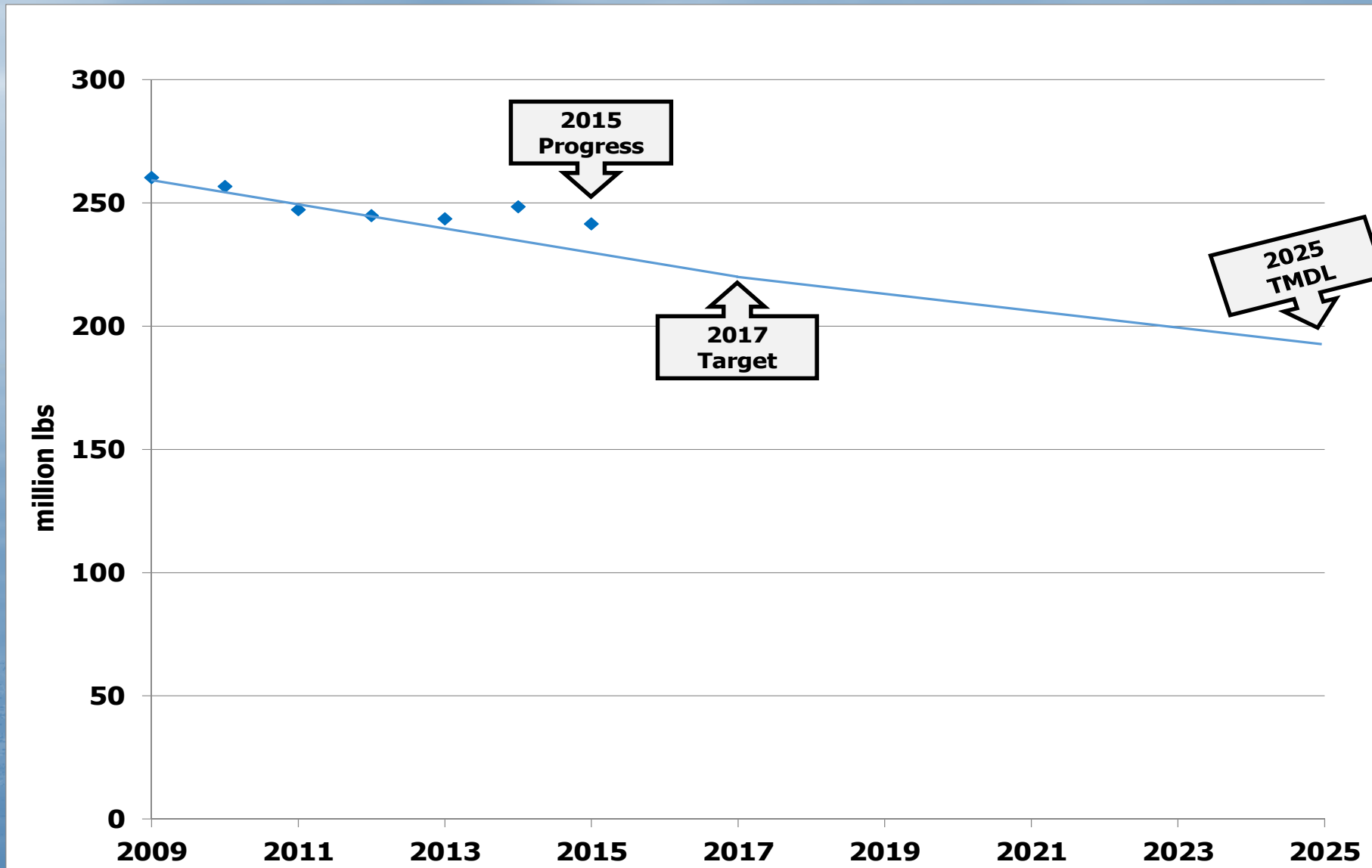


# Percent of the Goal Achieved for Phosphorus

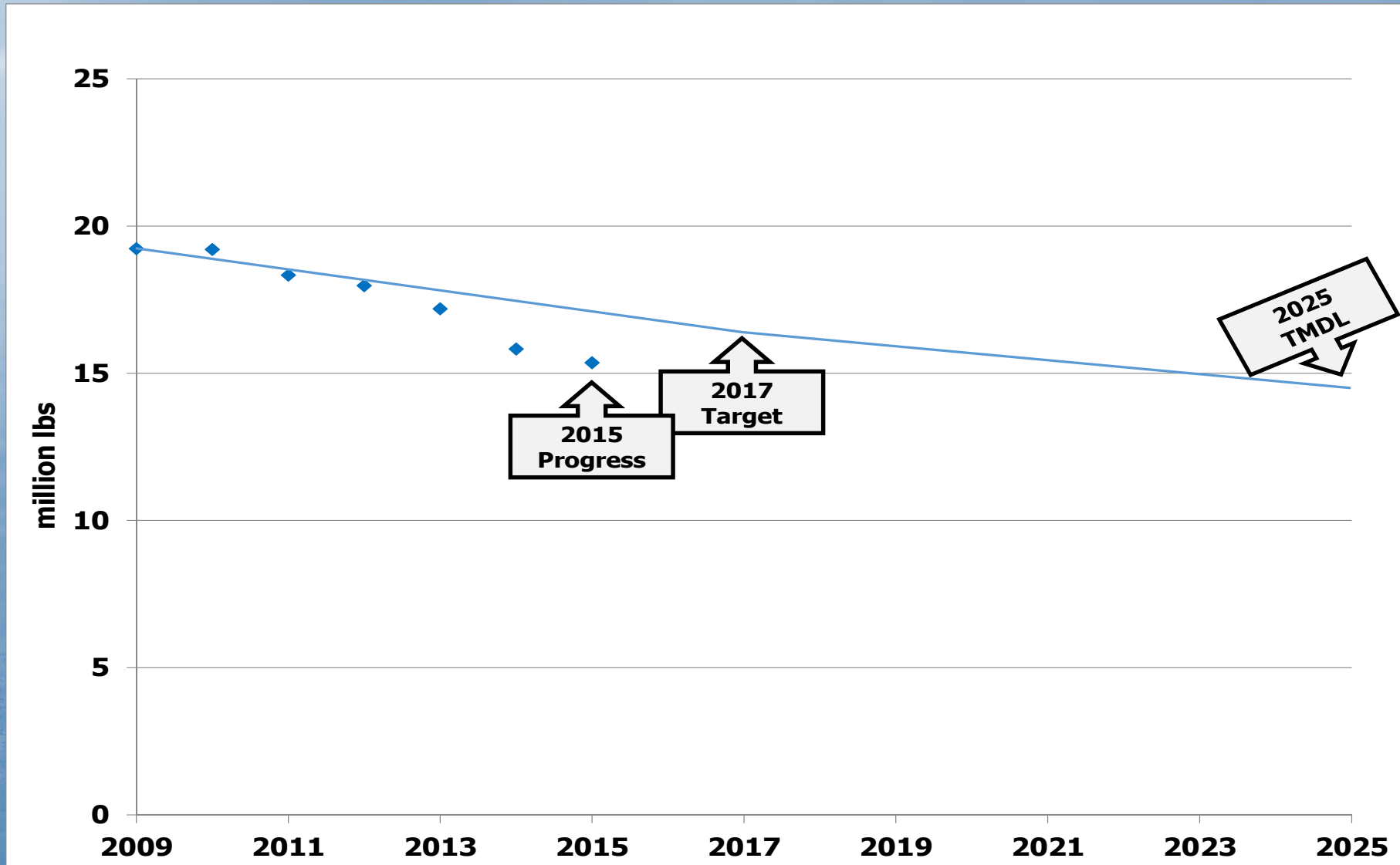
(2015 target = 45% of 2009-2025 load reduction)



# Chesapeake Bay Watershed Nitrogen Loads and Targets



# Chesapeake Bay Watershed Phosphorus Loads and Targets



# 2014-2015 EPA OVERSIGHT STATUS

	<b>Agriculture:</b>	<b>Urban/Suburban:</b>	<b>Wastewater:</b>	<b>Trading/Offsets:</b>
<b>DE</b>	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight
<b>DC</b>	Not Applicable	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight
<b>MD</b>	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight
<b>NY</b>	Ongoing Oversight	Ongoing Oversight	Enhanced Oversight	Ongoing Oversight
<b>PA</b>	Backstop Actions Level	Backstop Actions Level	Ongoing Oversight	Enhanced Oversight
<b>VA</b>	Ongoing Oversight	Enhanced Oversight	Ongoing Oversight	Ongoing Oversight
<b>WV</b>	Enhanced Oversight	Ongoing Oversight	Ongoing Oversight	Ongoing Oversight

# Midpoint Assessment Timeline

Jurisdiction Implementation of WIPs & Two Year Milestones  
Evaluation of Programmatic and Load Reduction Commitments  
Monitoring data assessments/factors affecting trend findings

Agreement on path forward and data inputs

- 2014
- New land use classifications and loading rates approved
- BMP panel recommendations for Phase 6.0 inclusion
- Agreement on Midpoint Assessment Schedule

Agreement on framing the priority issues

- 2015
- Early review of decision support tools
- James River chlorophyll assessment criteria completed
- Conowingo Dam study complete
- Review and incorporate decisions of climate change impacts
- BMP panel recommendations for Phase 6.0 inclusion

Approval of decision support tools

- 2016
- Final partnership comments on suite of tools
- Partnership input to any updates to local area target expectations
- Review and incorporate decisions of climate change impacts

Establish Phase III WIP targets

- 2017
- Phase III WIP expectations finalized
- Partnership informs final decisions on reallocation process

Complete Phase III WIPs

- 2018
- Support for Phase III WIP development using Phase 6.0 modeling tools

Evaluation of 60% by 2017 target using Phase 5.3.2 modeling tools

- 2018
- Comprehensive monitoring and trend findings through 2016

# 2017 MIDPOINT ASSESSMENT

- **Phase 6 Land Use/Land Cover**
- **Climate Change**
- **Local Area Targets**
- **Phase 6 Model Update**
- **Conowingo Dam & James River Chlorophyll-a**
- **2025 Forecasted Conditions**

# 2017 MIDPOINT ASSESSMENT

- **Lag Times and P Saturated Soils**
- **Water Quality Monitoring Trends**
- **BMP Expert Panels**
- **BMP Verification**
- **BayFAST**
- **Multiple Benefits**



# ENVIRONMENTAL FINANCE CENTER



Municipal Online Stormwater Training Center

# THANK YOU

