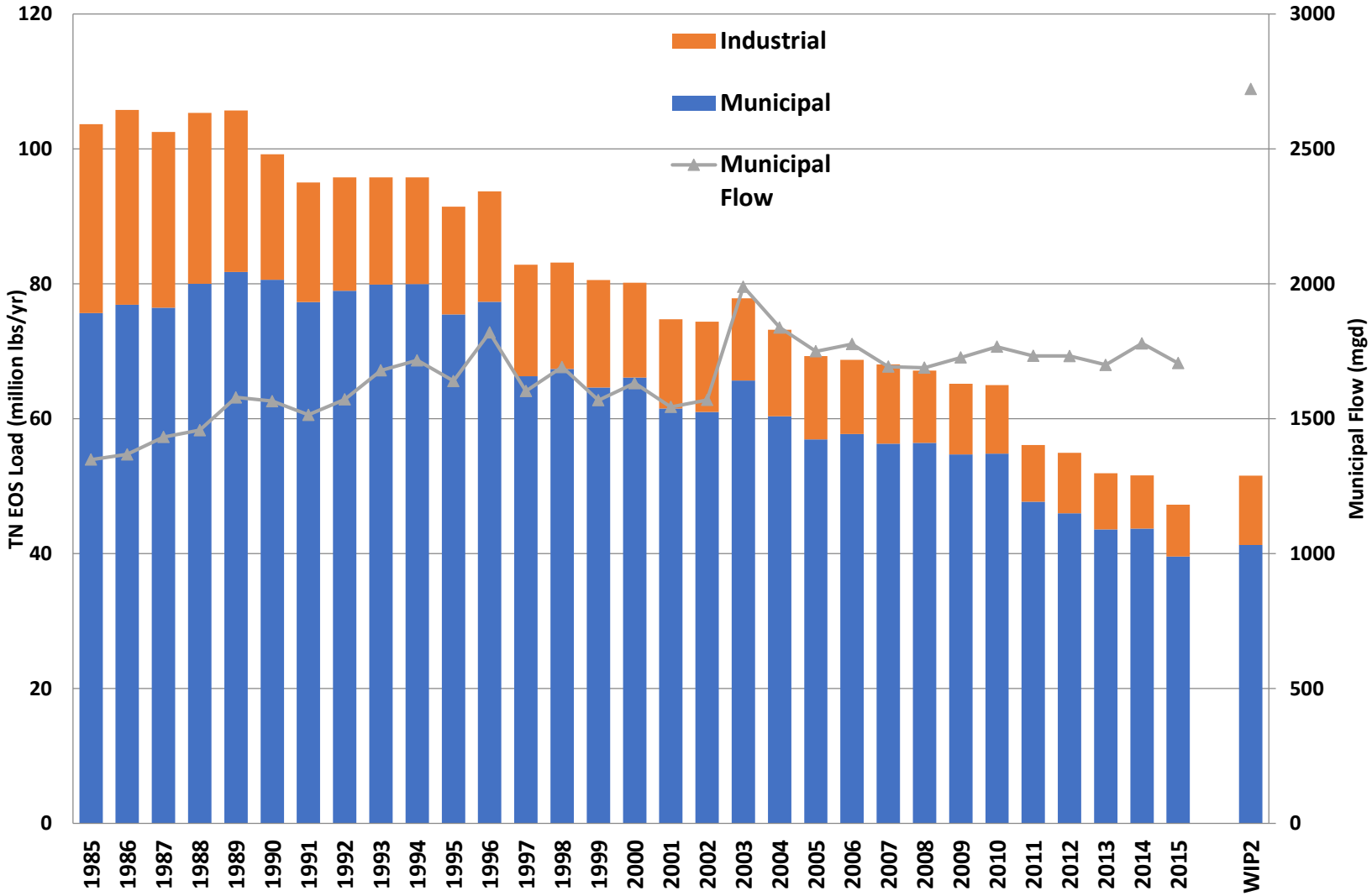
# The Good, the Not Fully Understood, and the Bad

**Rich Batiuk**
**Associate Director for Science, Analysis and Implementation**
**U.S. EPA Chesapeake Bay Program Office**
**May 4, 2018 Chesapeake Bay Commission Meeting**

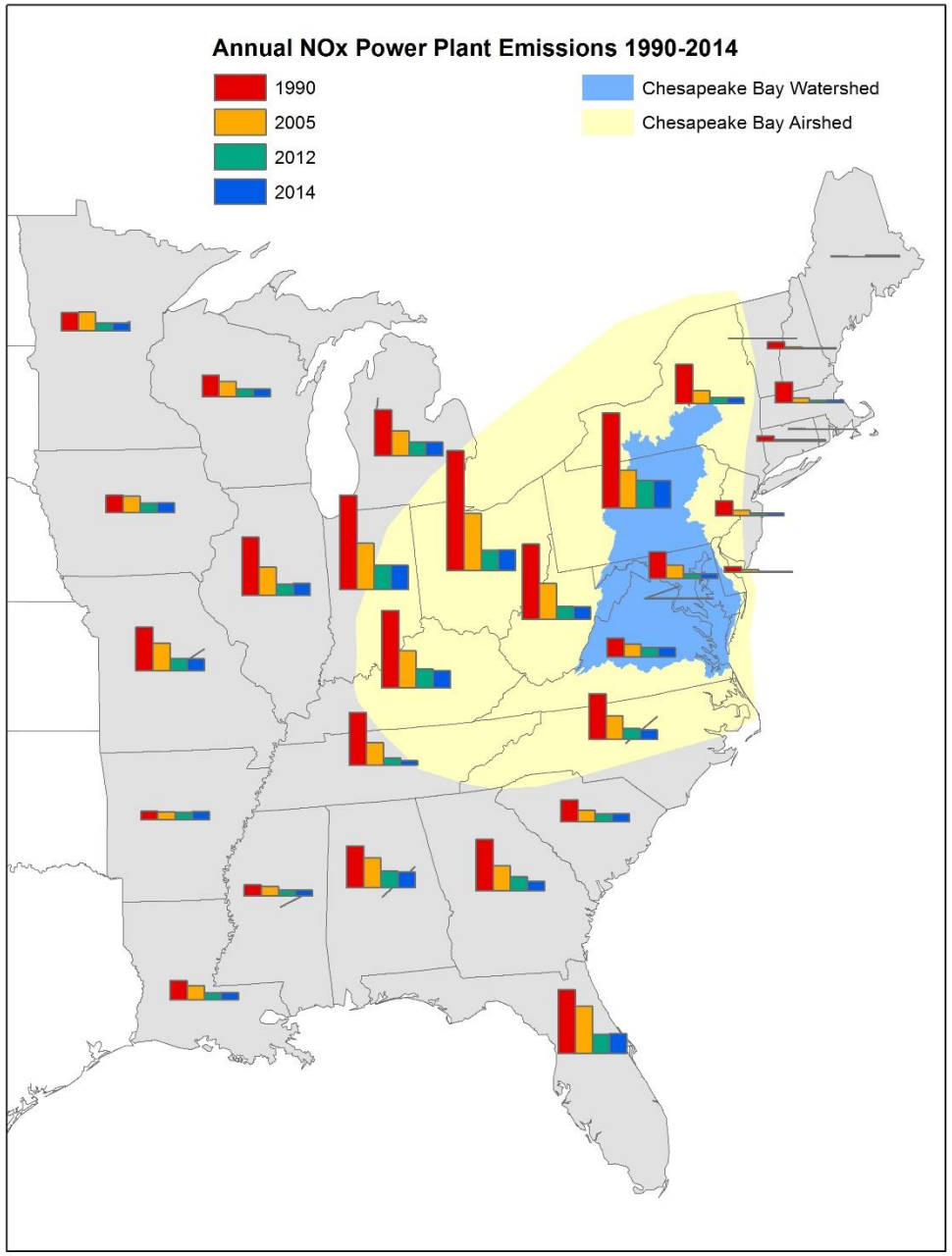
# The Good

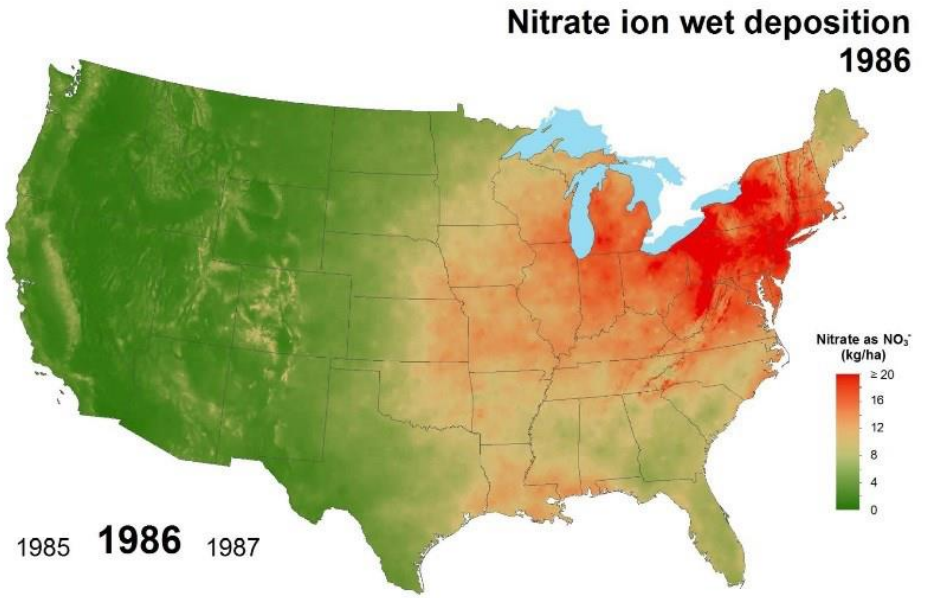
# The Great!

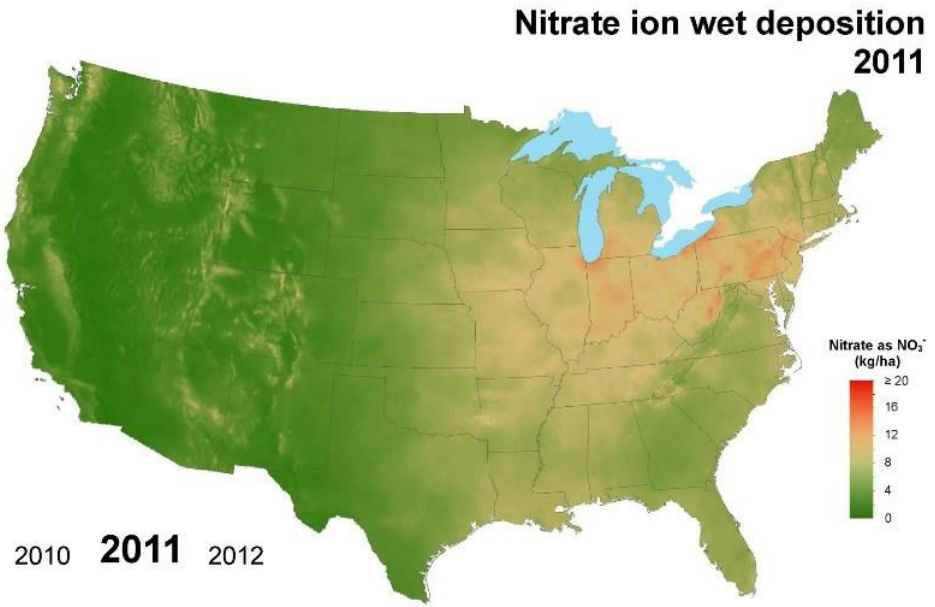
# Chesapeake Bay Watershed Municipal and Industrial Wastewater Treatment Facilities Achieved their 2025 Goal a Decade Early!

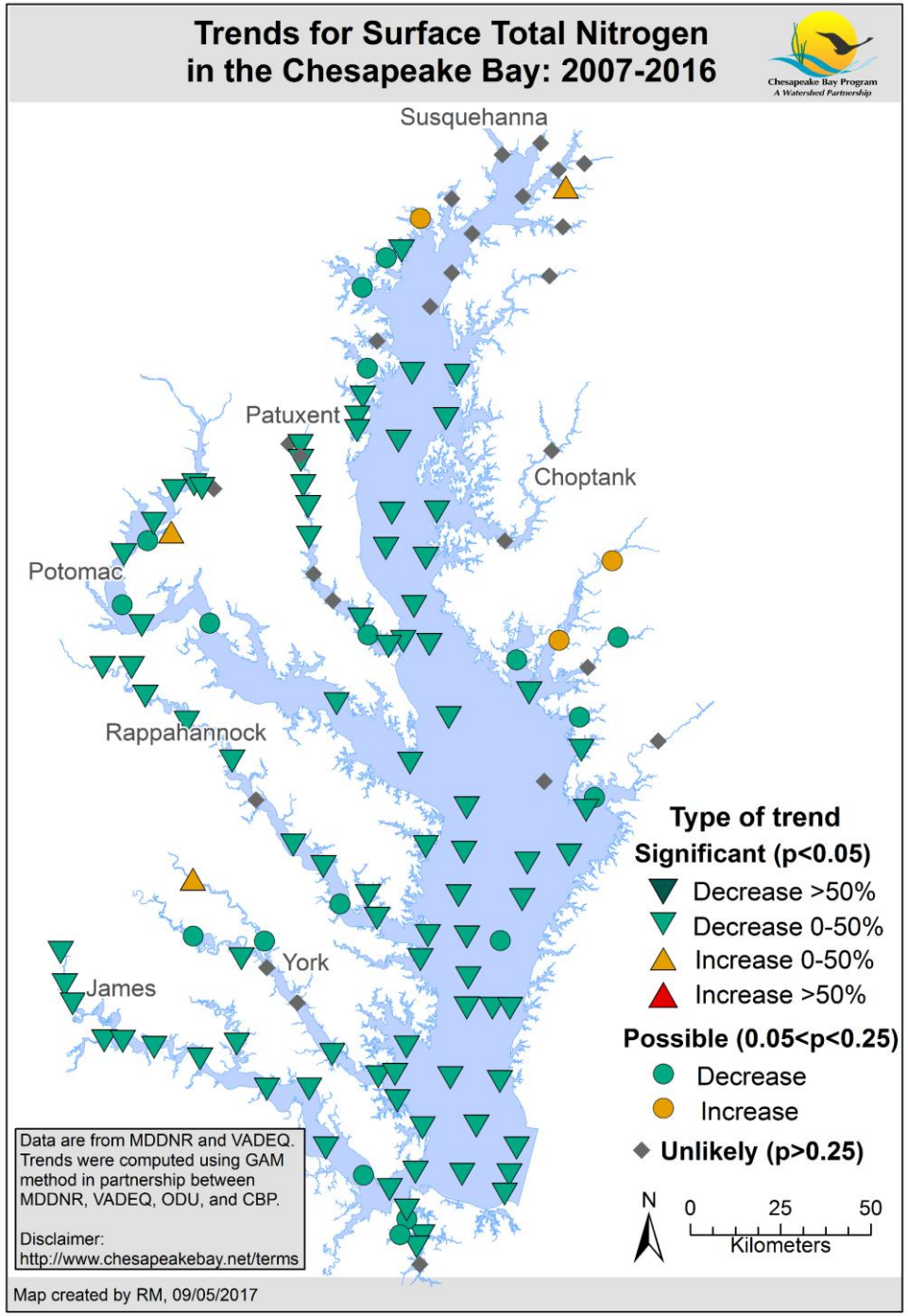


# Clean Act Air Implementation by the States has Resulted in a 35 Million Pound Reduction of Nitrogen Loads to Chesapeake Bay from 1985 to 2015



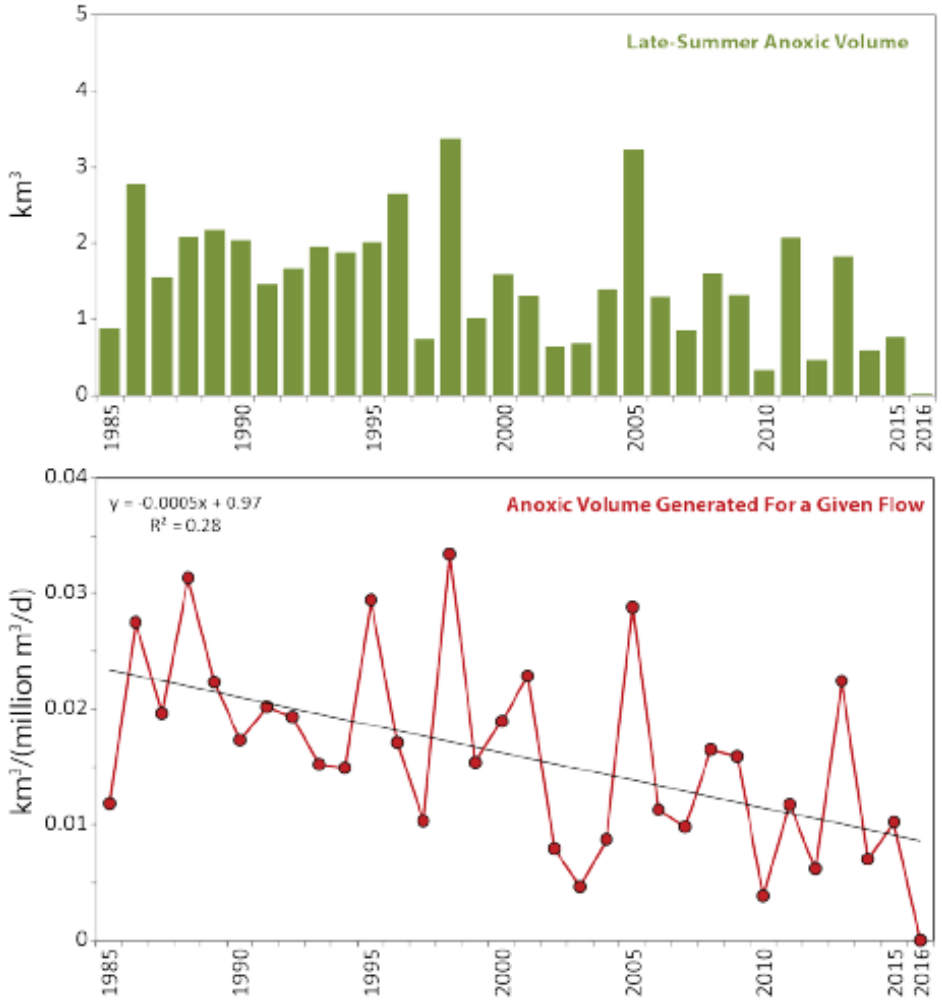






# Nitrogen concentrations in Chesapeake Bay and its tidal rivers are decreasing almost every where we are monitoring them!

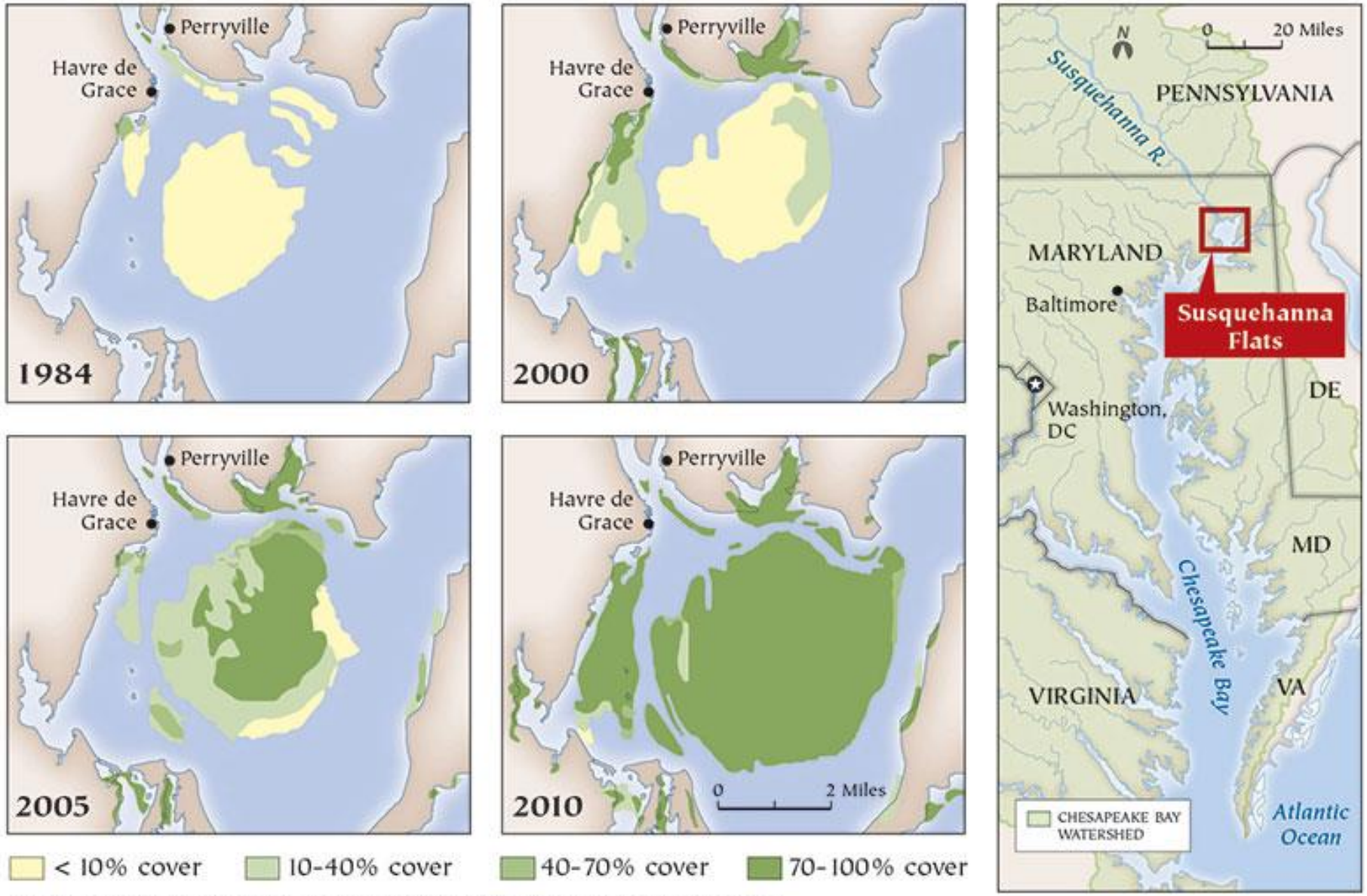
Source: Testa et al., 2017

# The Chesapeake Bay's Summertime Dead Zone is Decreasing in Size!



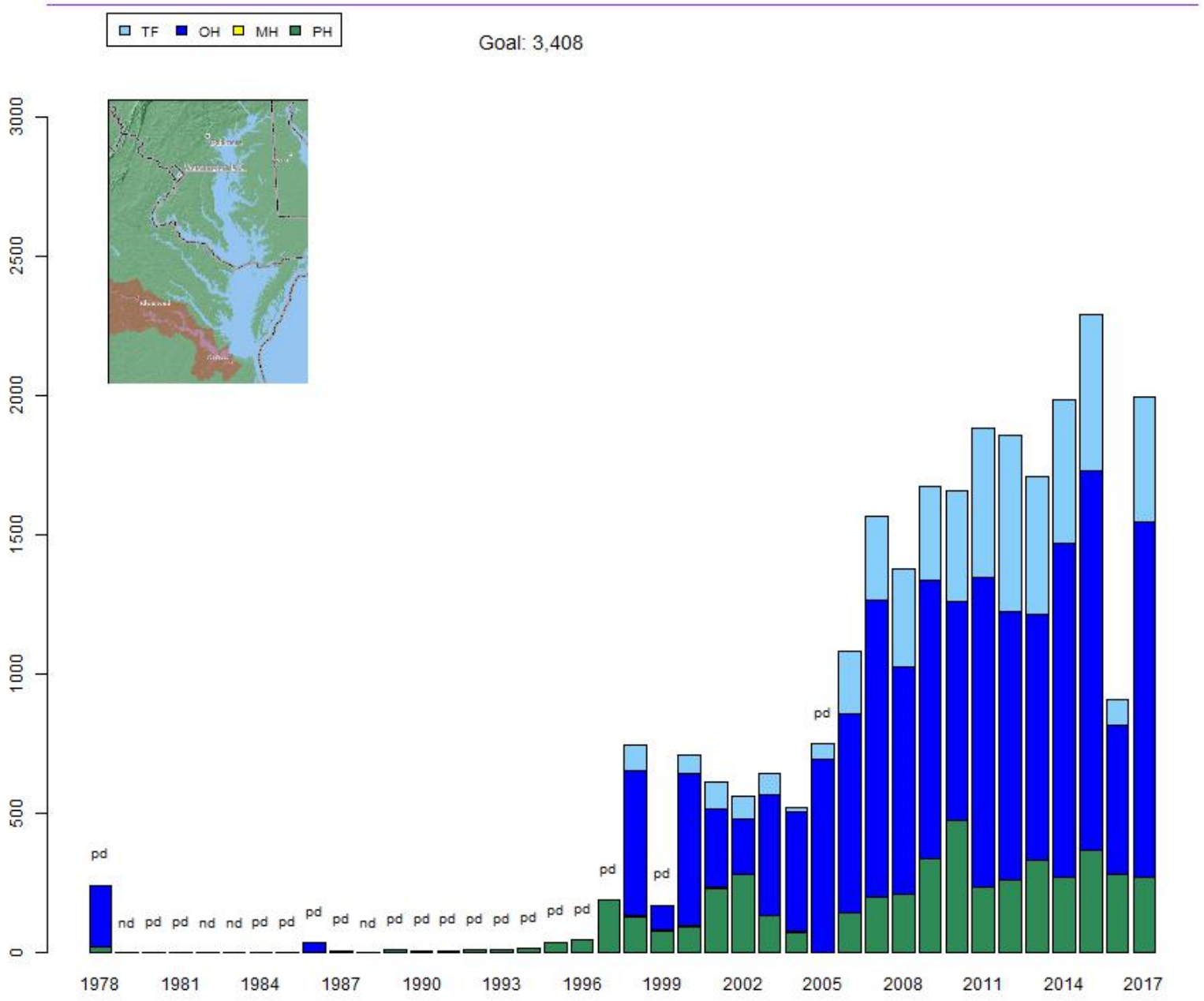

Source: Testa et al., 2017

# Underwater Bay Grasses Coming Back, Setting New Record Highs in the Past Three Years

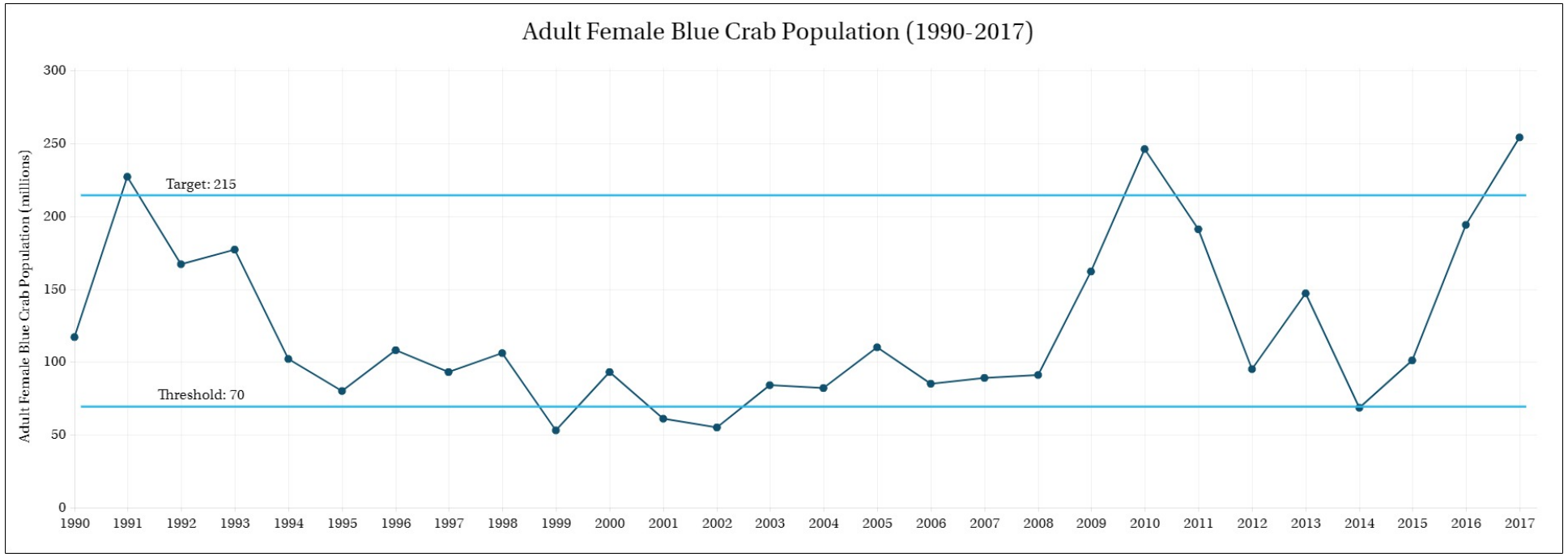



SOURCE: UNIVERSITY OF MARYLAND, CENTER FOR ENVIRONMENTAL SCIENCE; SEA GRANT, MARYLAND

# Tidal James River Ecosystem is Getting Healthier!



# Blue crab abundance is improving

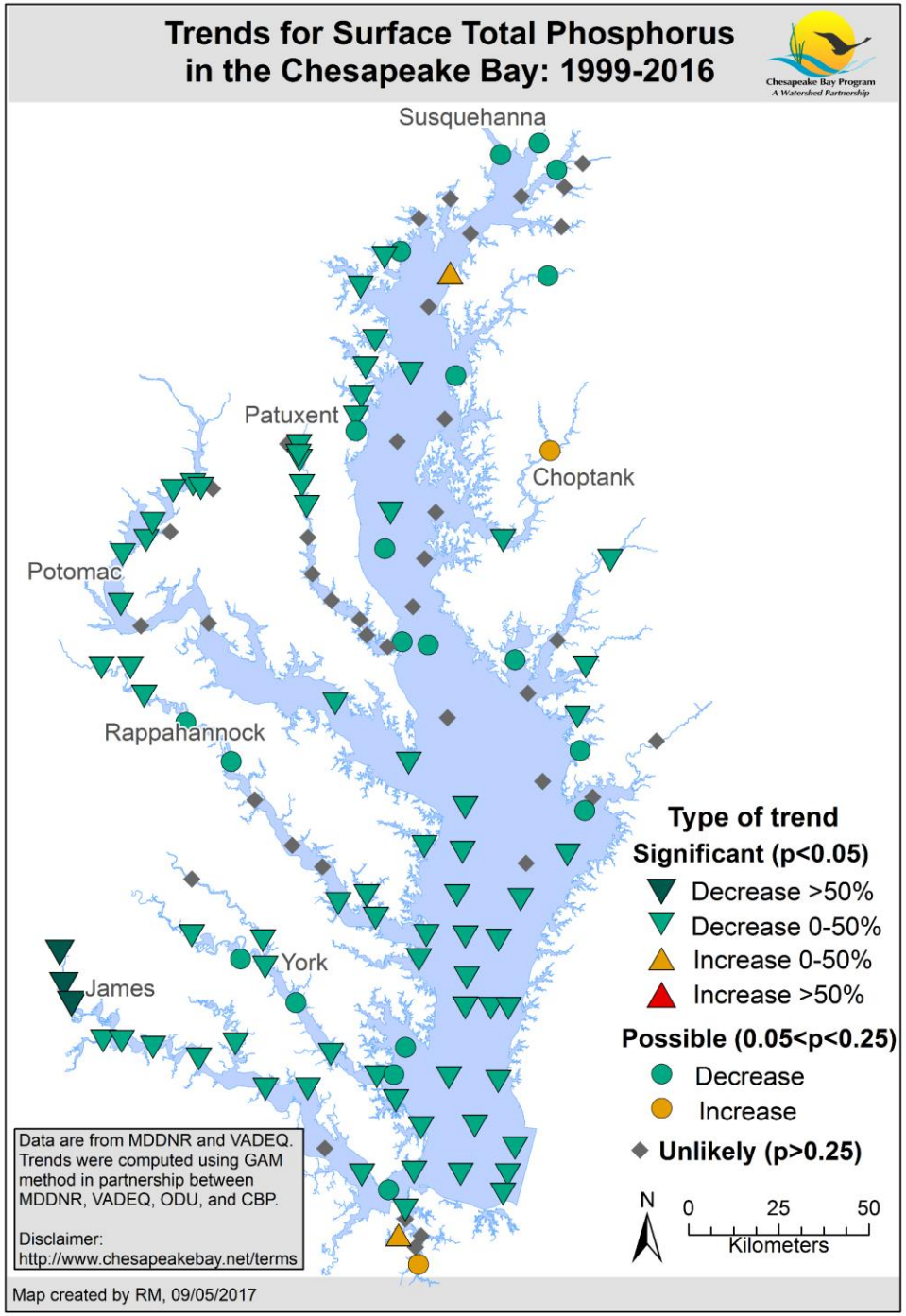


# Chesapeake Bay Commission-Led Policy Making and Legislation has been a Big Part of the Bay's Ongoing Recovery

- Phosphate detergent ban
- Sediment and erosion control
- Stormwater management
- Rockfish moratorium
- Nutrient management
- Blue crab fisheries management
- Wastewater treatment funding
- Forest buffers
- Ag certainty
- Stream exclusion
- Lawn fertilizers

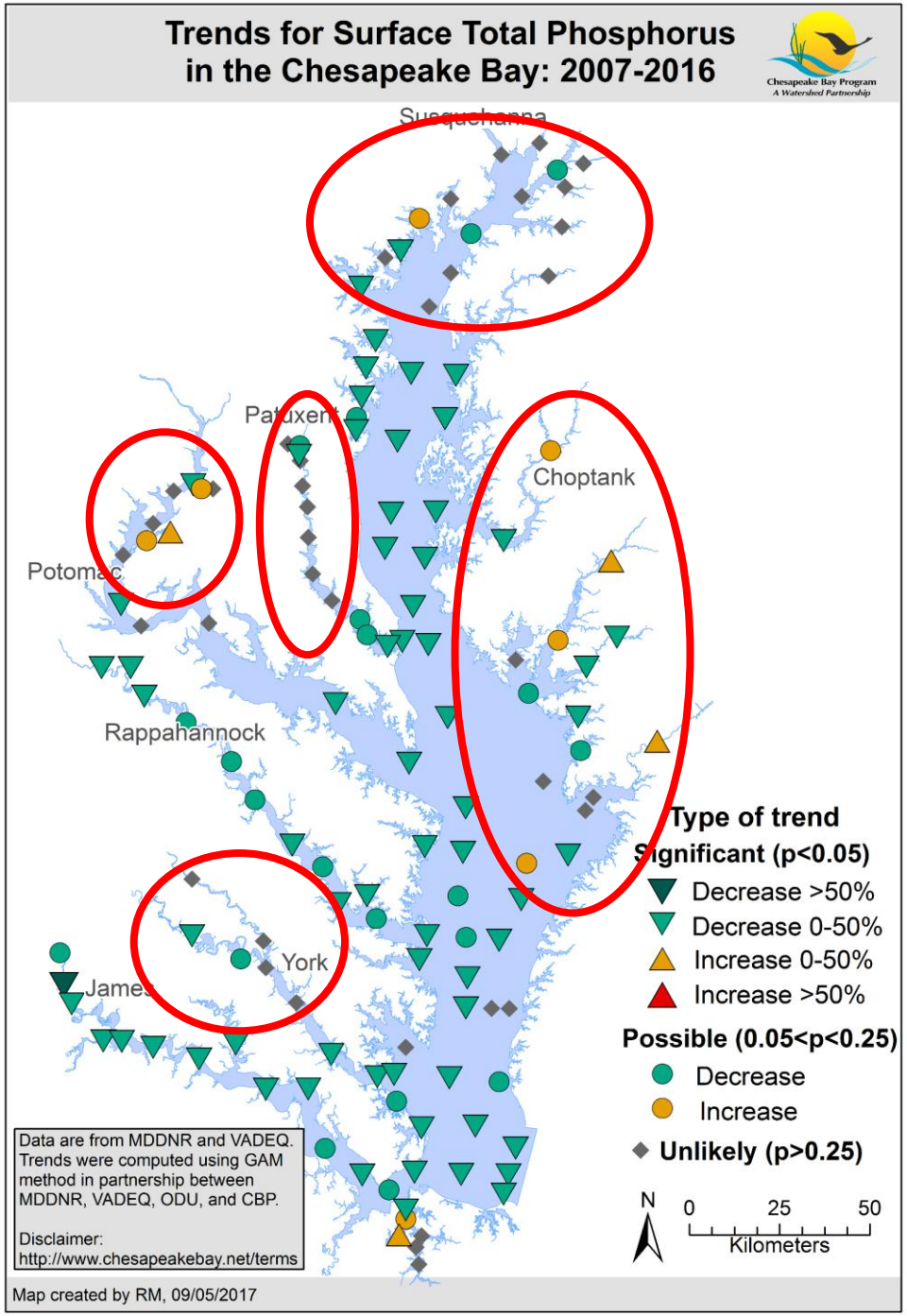
# Not Fully Understood

# Why are We Losing Ground on Phosphorus?



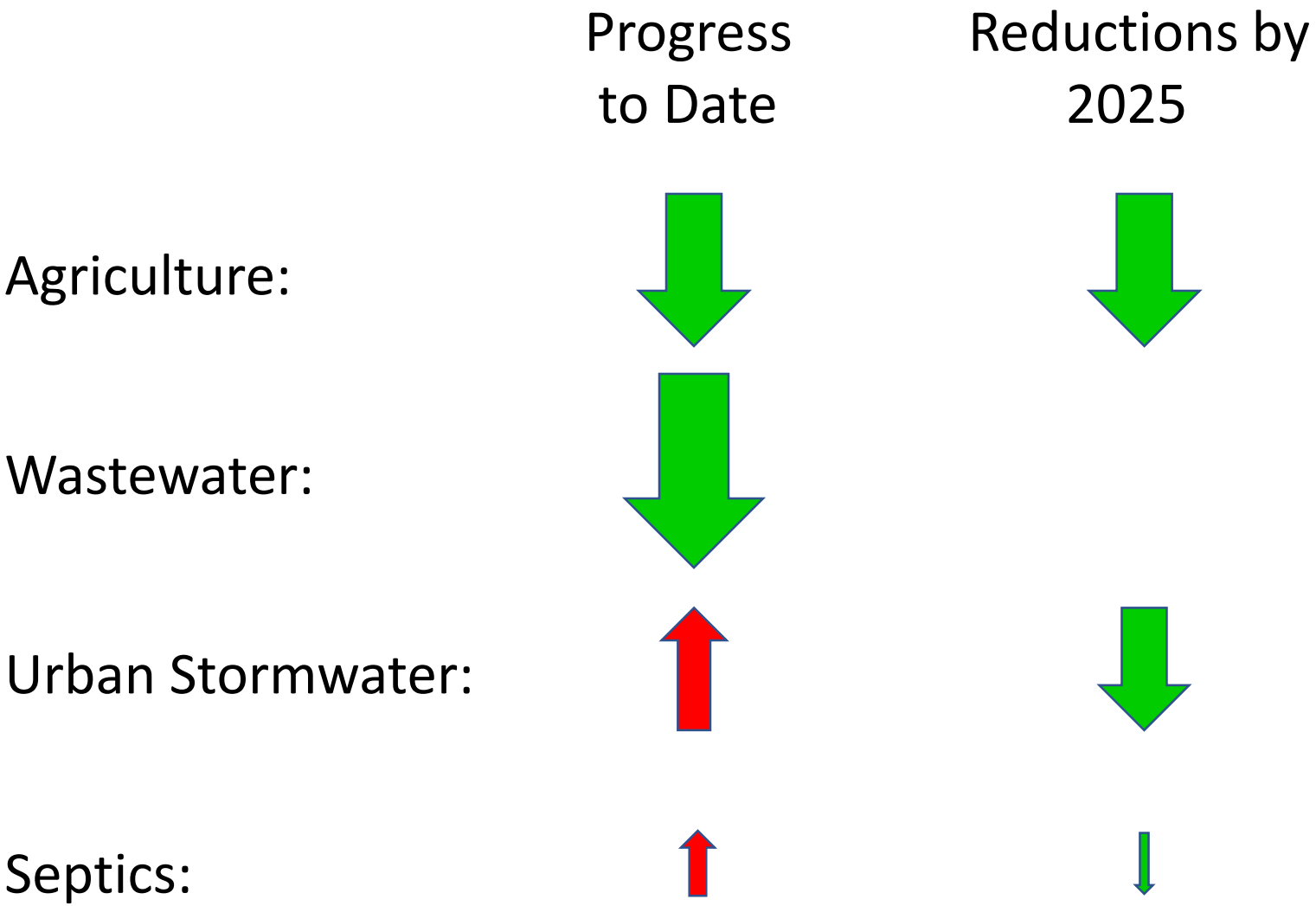

**Phosphorus concentrations in Chesapeake Bay and its tidal rivers are generally decreasing at 3/4 of our monitoring stations over past 20 years**

**However, in the past decade, phosphorus concentrations trends in Chesapeake Bay and its tidal rivers have been flattening out and even increasing**



# How to Reverse Course on Nitrogen in Stormwater?

# Urban Stormwater Nitrogen Loads Still Increasing

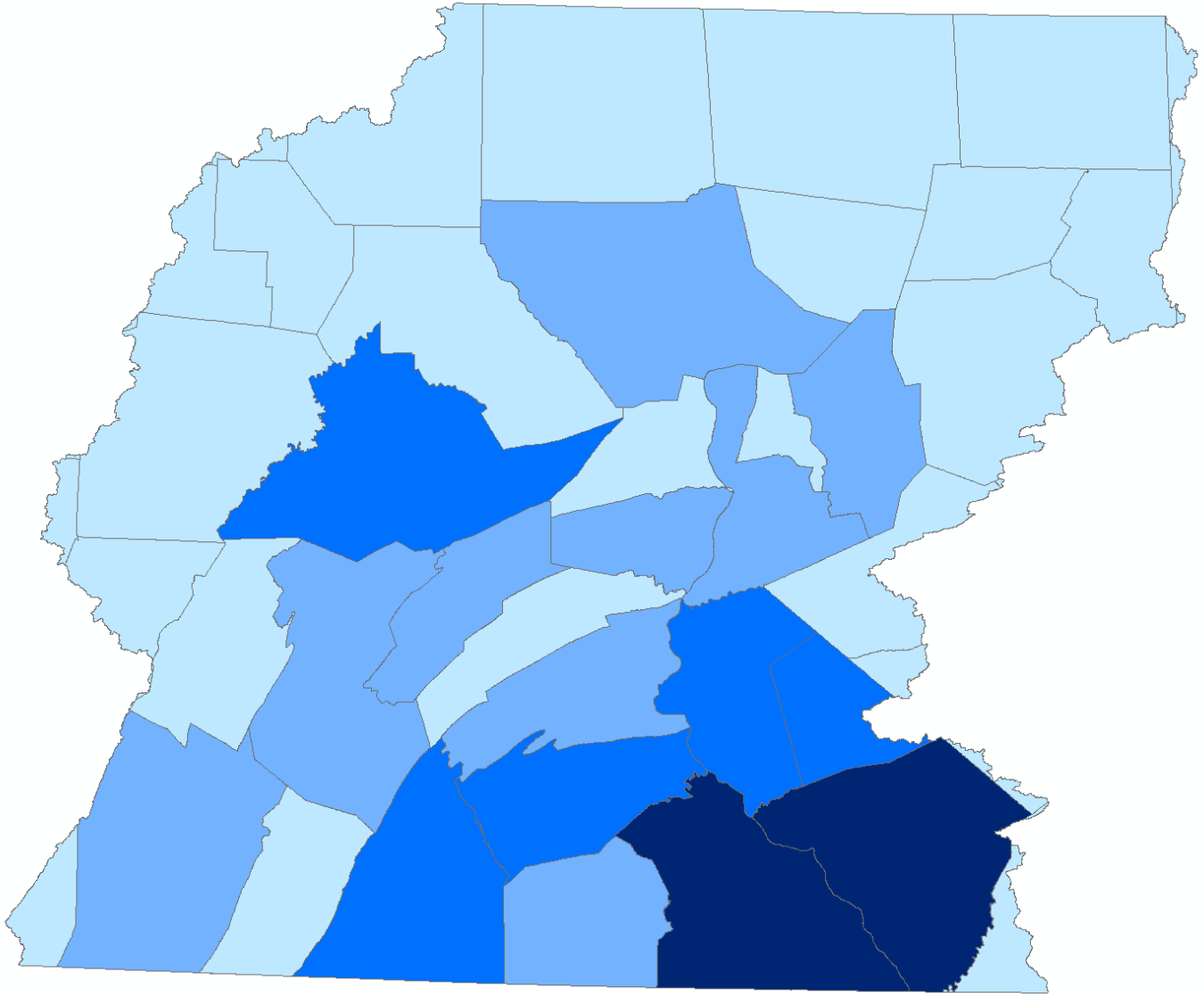


# The Bad

# Opportunities for Policy Solutions

# Pennsylvania

# We Know Where to Go for Nutrient Reductions



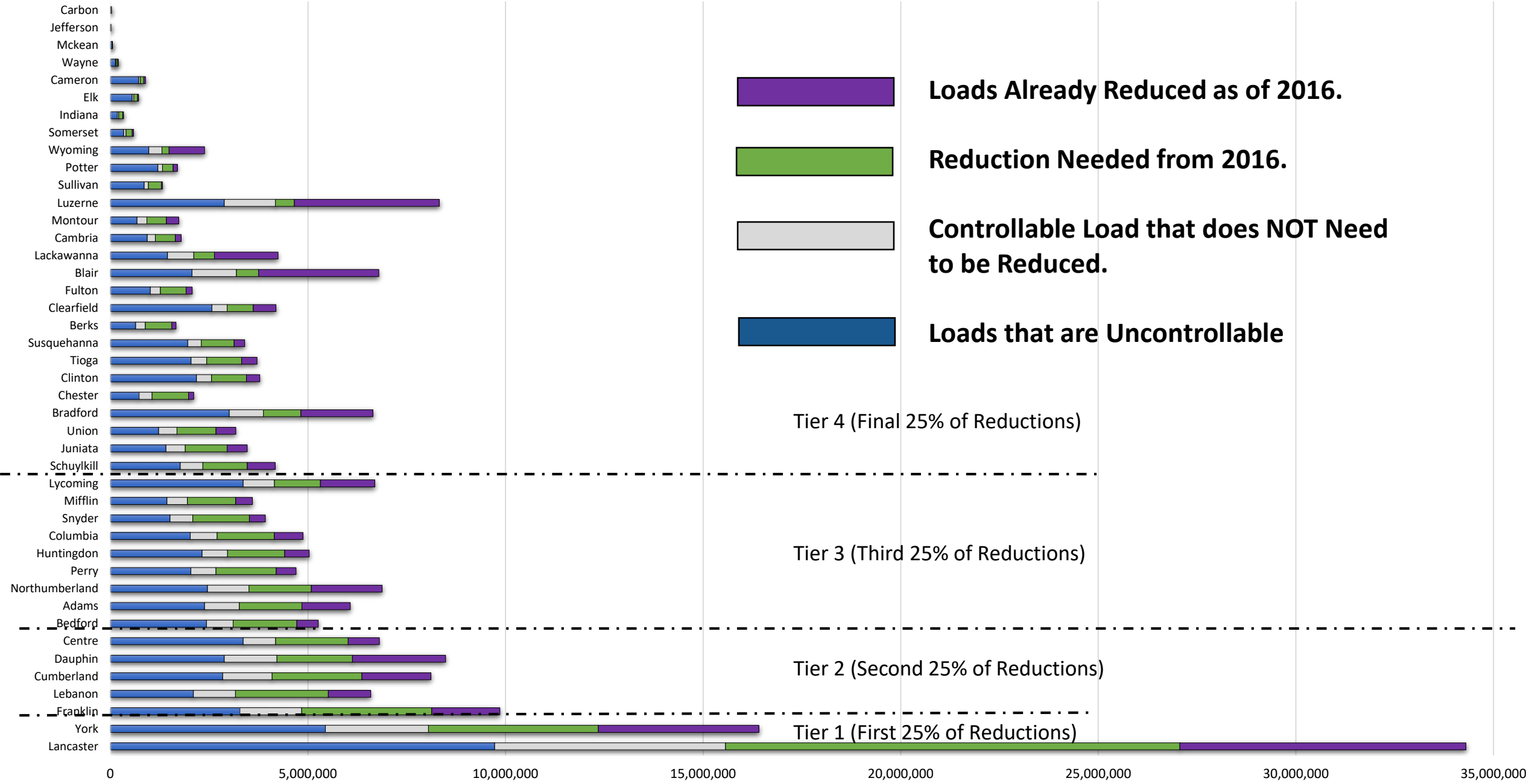
Tier 1 - First 25% of Reductions

Tier 2 - Second 25% of Reductions

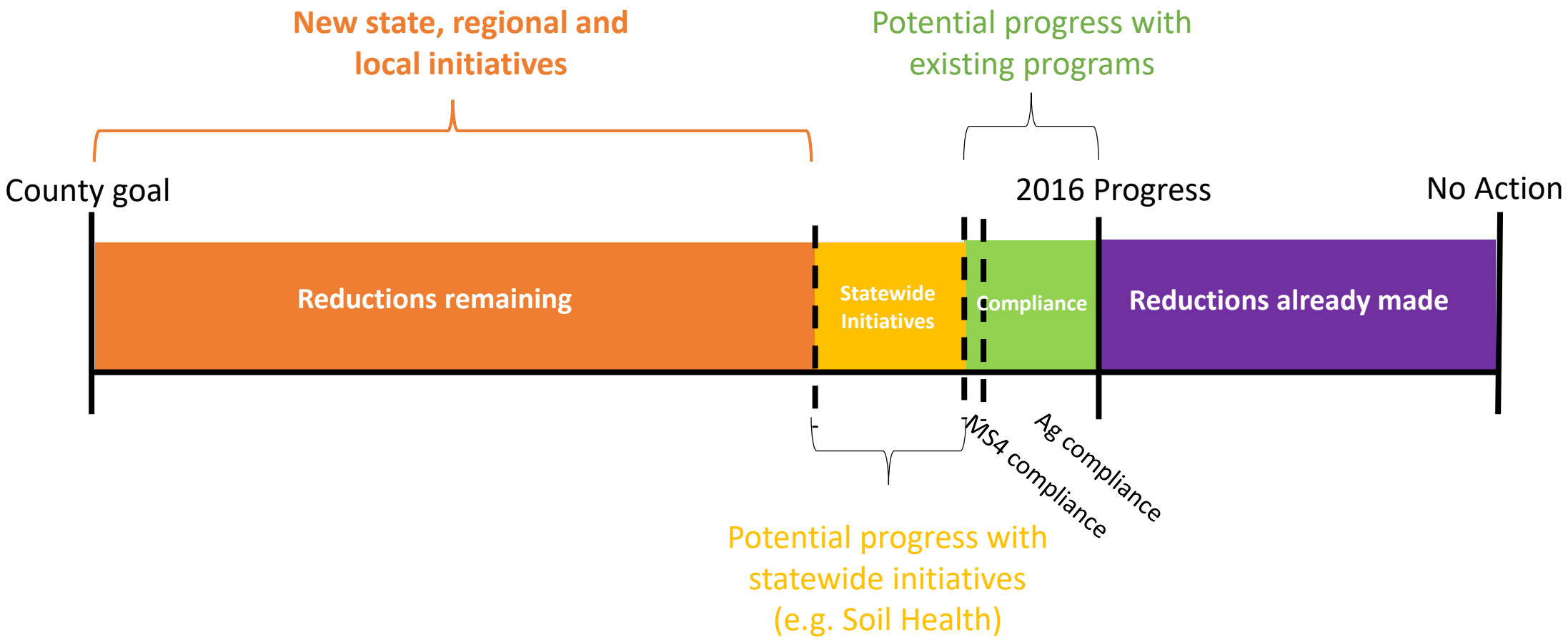
Tier 3 - Third 25% of Reductions

Tier 1 - Last 25% of Reductions

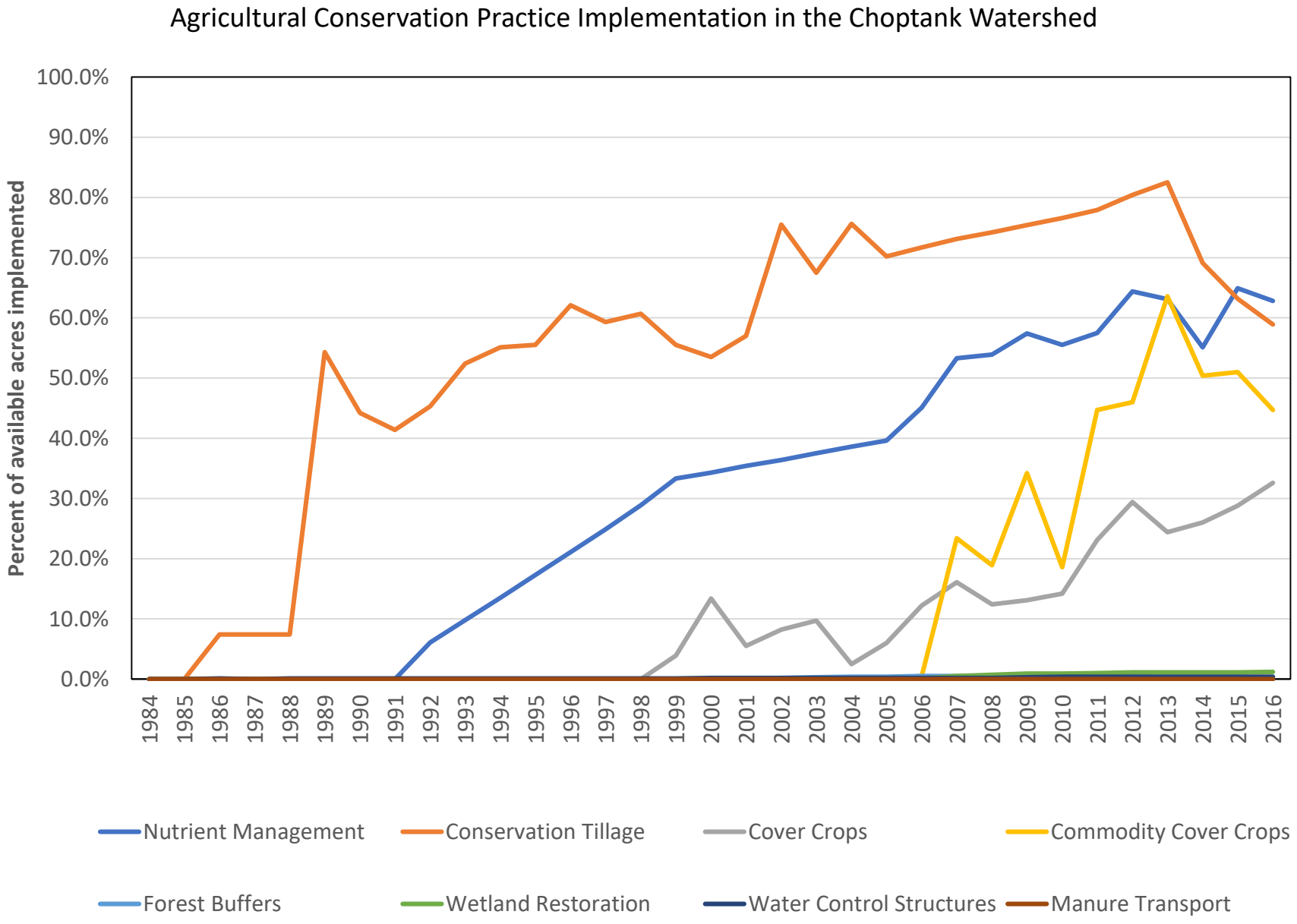
# Pennsylvania is Moving Towards County-Level Goals for Nutrient Load Reductions

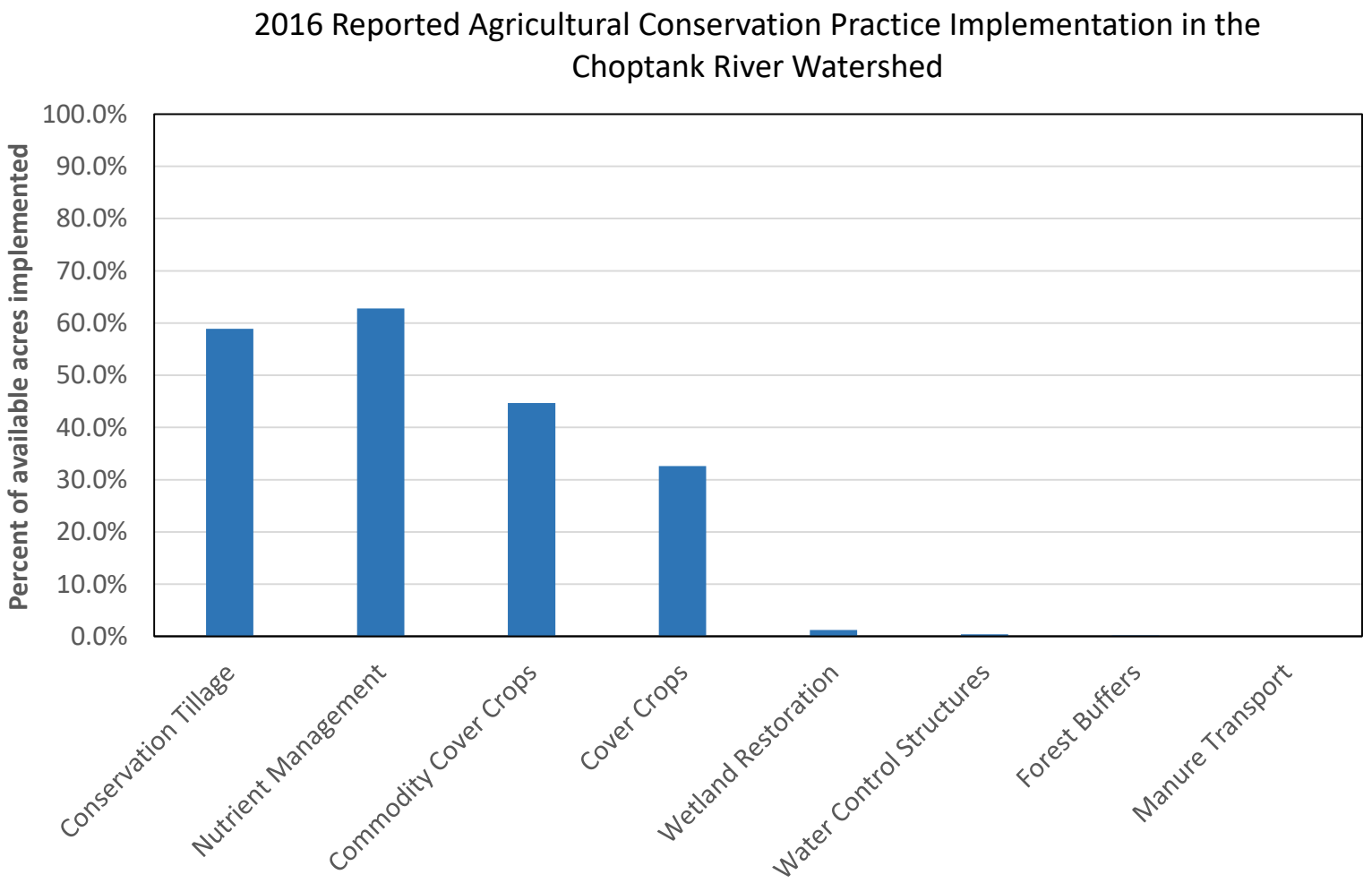


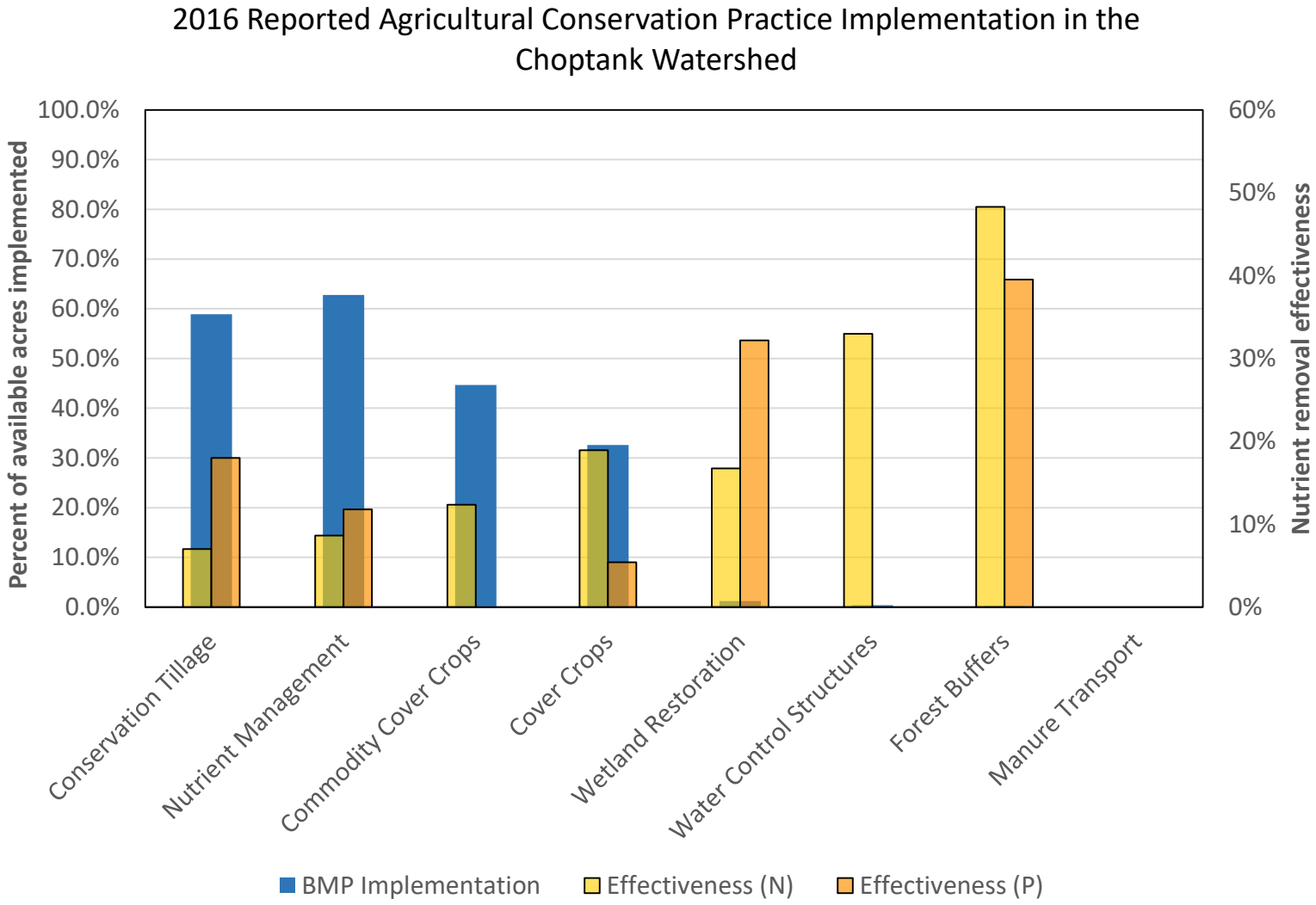
# Big Challenges in Funding, Providing Infrastructure to Achieve PA Local and Bay Water Quality



# Agriculture

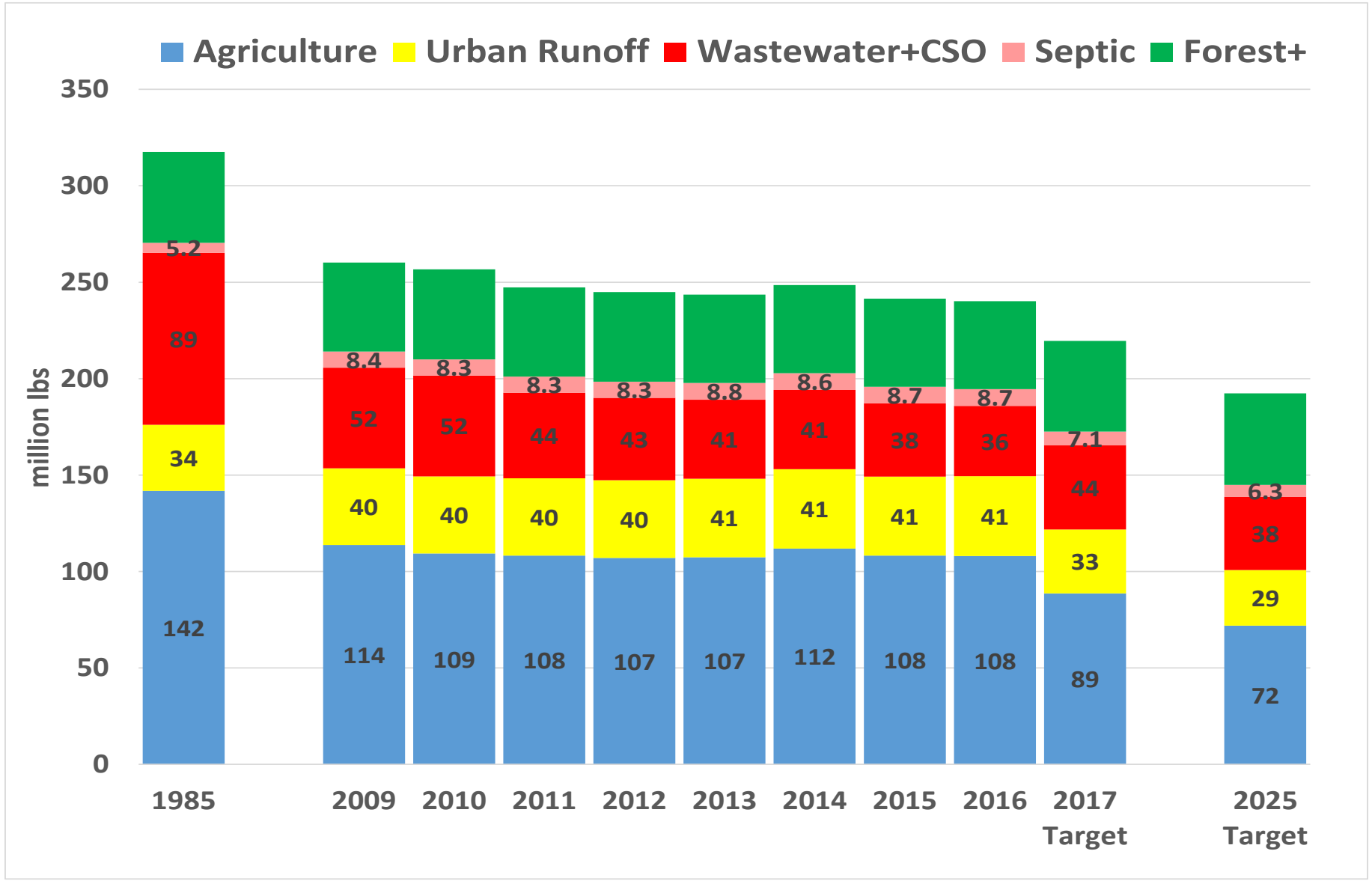

Agricultural Conservation Practice Implementation in the Choptank Watershed
Percent of available acres implemented
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Nutrient Management
Conservation Tillage
Cover Crops
Commodity Cover Crops
Forest Buffers
Wetland Restoration
Water Control Structures
Manure Transport


2016 Reported Agricultural Conservation Practice Implementation in the Choptank River Watershed
Percent of available acres implemented
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Conservation Tillage
Nutrient Management
Commodity Cover Crops
Cover Crops
Wetland Restoration
Water Control Structures
Forest Buffers
Manure Transport


2016 Reported Agricultural Conservation Practice Implementation in the Choptank Watershed
Percent of available acres implemented
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
60%
50%
40%
30%
20%
10%
0%
Nutrient removal effectiveness
Conservation Tillage
Nutrient Management
Commodity Cover Crops
Cover Crops
Wetland Restoration
Water Control Structures
Forest Buffers
Manure Transport
BMP Implementation
Effectiveness (N)
Effectiveness (P)

# Private Capital and Financing

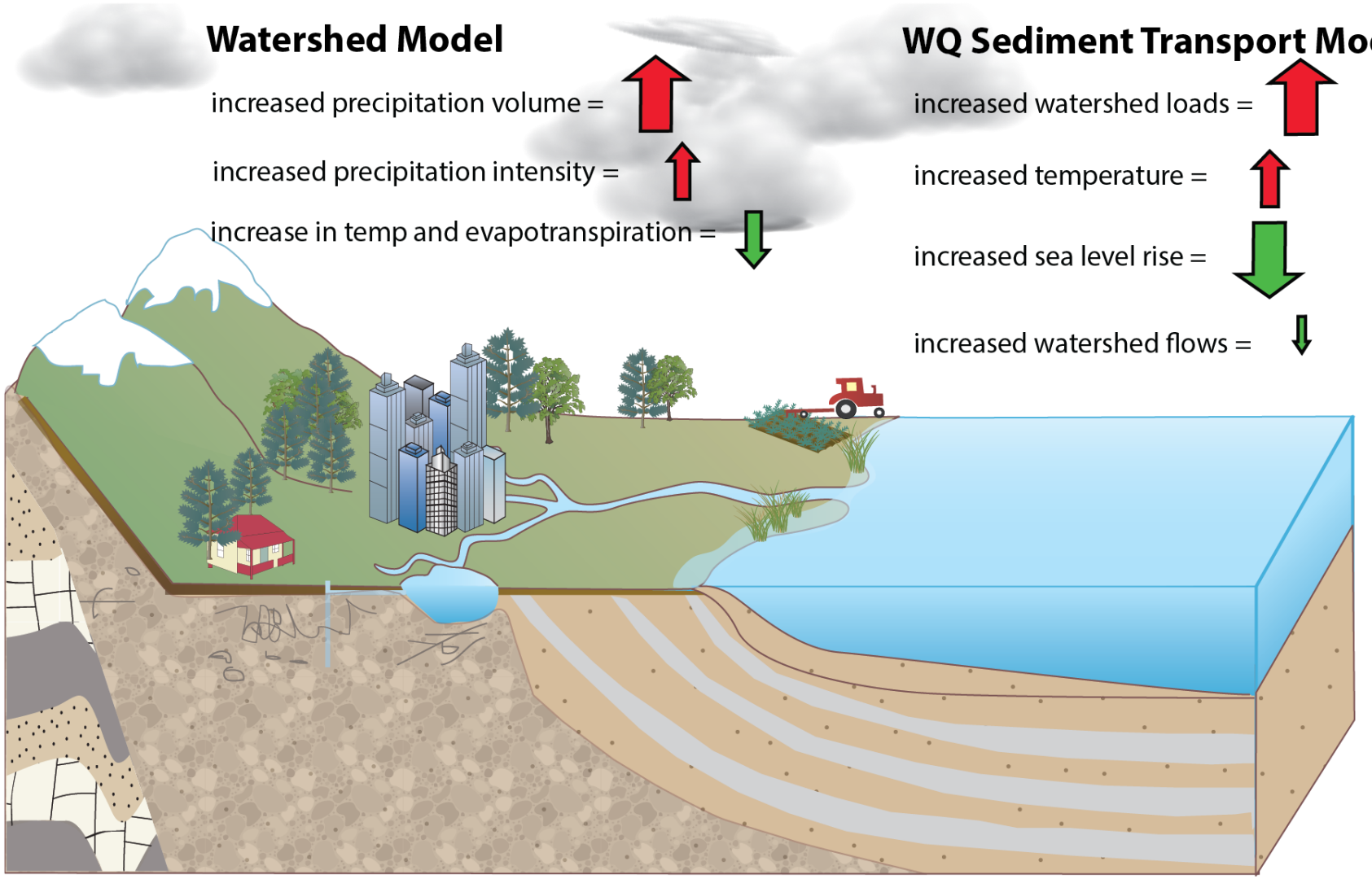
# Chesapeake Bay Watershed
# Nitrogen Loads and Goals: 1985-2025



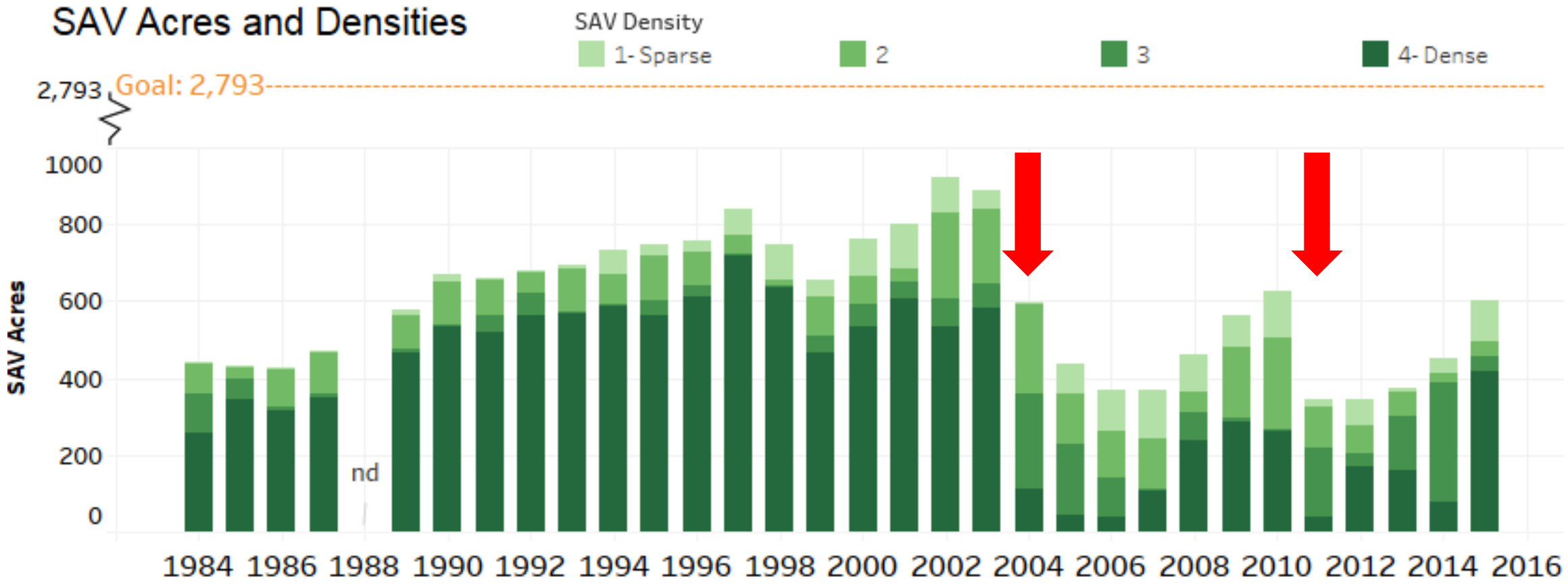
# Changing Climate

# Accounting for Changing Conditions

## Which Practices are More Effective Under these Projected Conditions?



# Lower York River Underwater Bay Grasses Responding to High Summer Temperatures



# SUMMARY

## The Great:

- Multitude of clear signs that the Bay ecosystem is recovering
- Bay underwater grasses, oxygen, nutrient loads, water clarity, crabs and more

## The Not Fully Understood:

- What's behind the recent increasing phosphorus loads reversing decades of improving trends
- How to go about reducing nitrogen in stormwater runoff

## Opportunities for Policy Solutions:

- Building the capacity for Pennsylvania clean up its local waters and meet its Bay commitments
- Helping farmers adopt the most pollutant load reduction effective practices in the right places
- Building up the investment of private capital and broadening local financing solutions
- Adapting our Bay and watershed restoration efforts to reflect a changing climate

**Rich Batiuk**

**Associate Director for Science, Analysis and Implementation**

**U.S. EPA Chesapeake Bay Program Office**

**410-267-5731 Work**

**443-223-7823 Mobile**

**batiuk.richard@epa.gov**

**www.chesapeakebay.net**

Chesapeake Bay Program

*Science. Restoration. Partnership.*