



Chesapeake Bay Restoration

BMP Verification

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EPA Chesapeake Bay Program Office

Local Government Advisory Committee Meeting

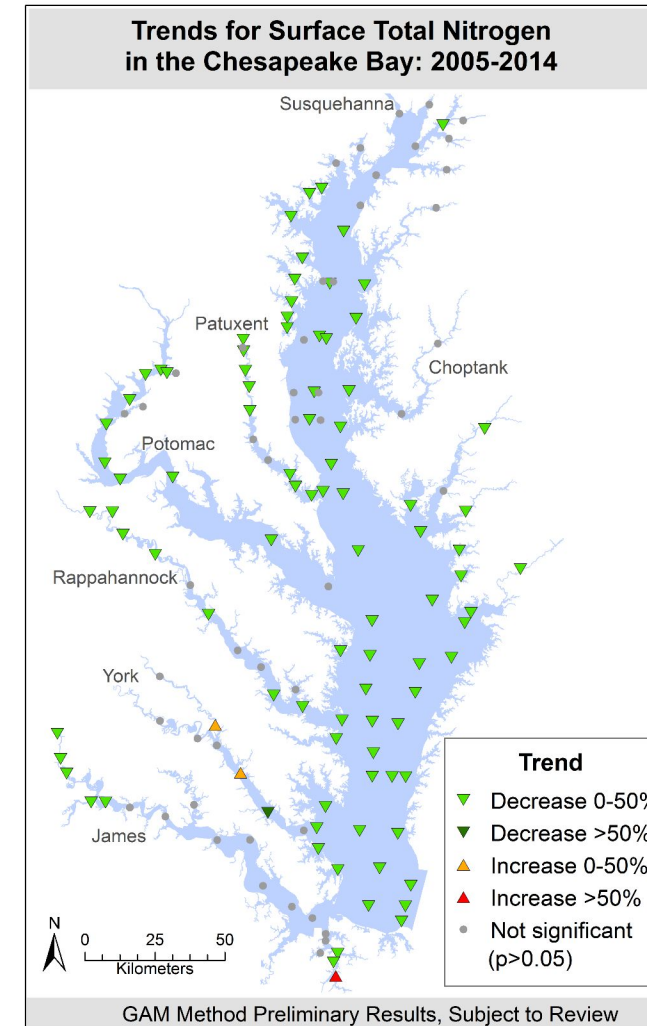
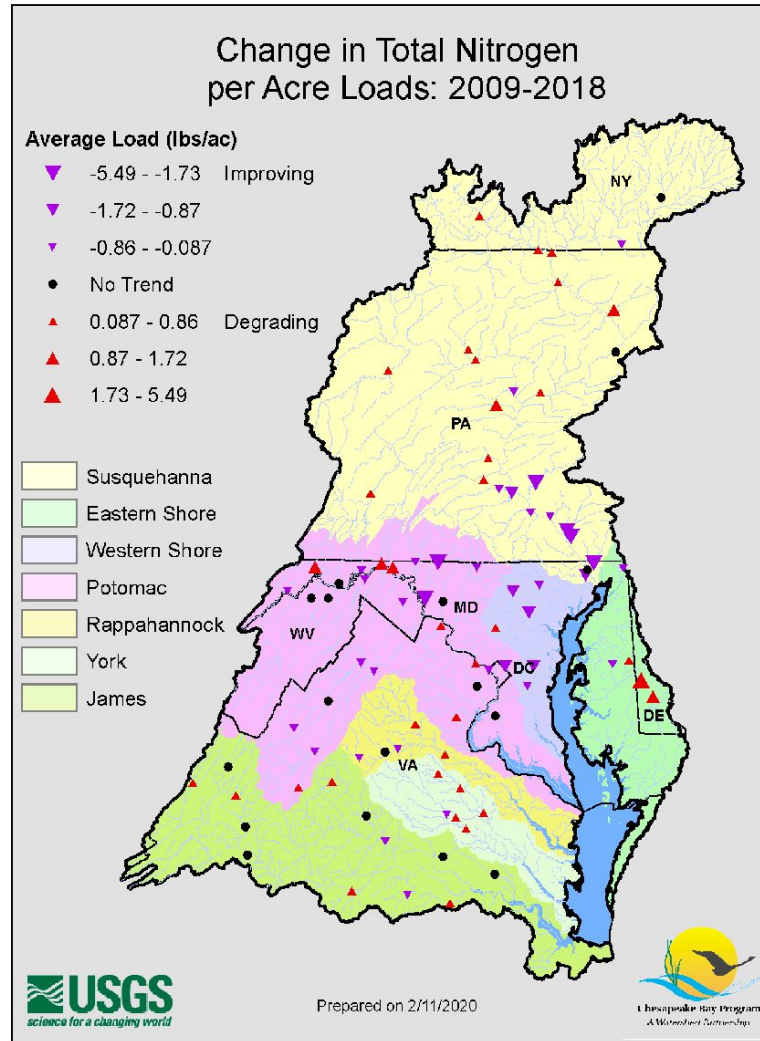
March 19, 2020

Chesapeake Bay TMDL Accounting

- 1) Water Quality Standards in the Chesapeake Bay tidal waters
- 2) Monitored loads at gauging stations through the Chesapeake Bay watershed
- 3) Reported BMP implementation levels
- 4) Modeled loads

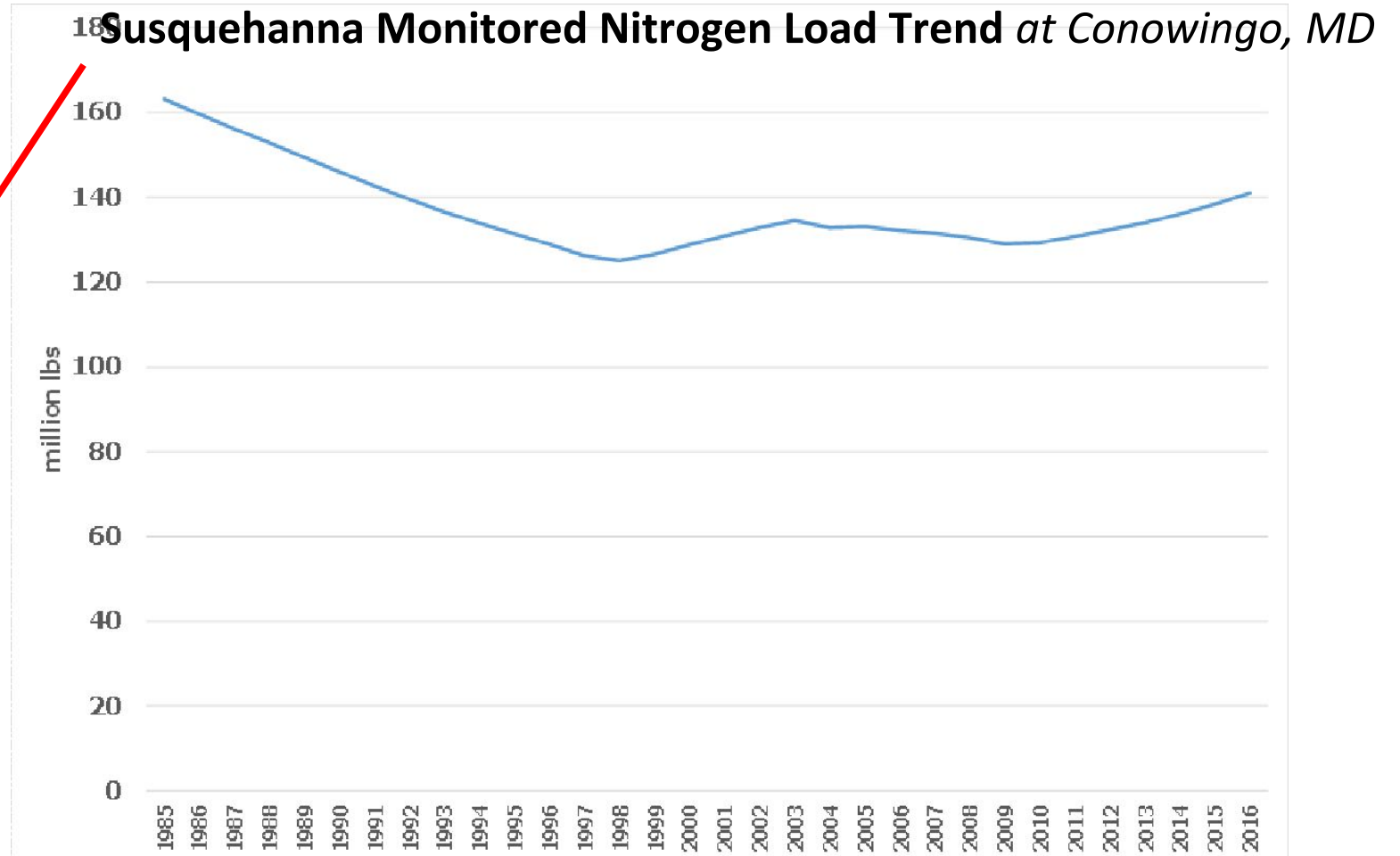
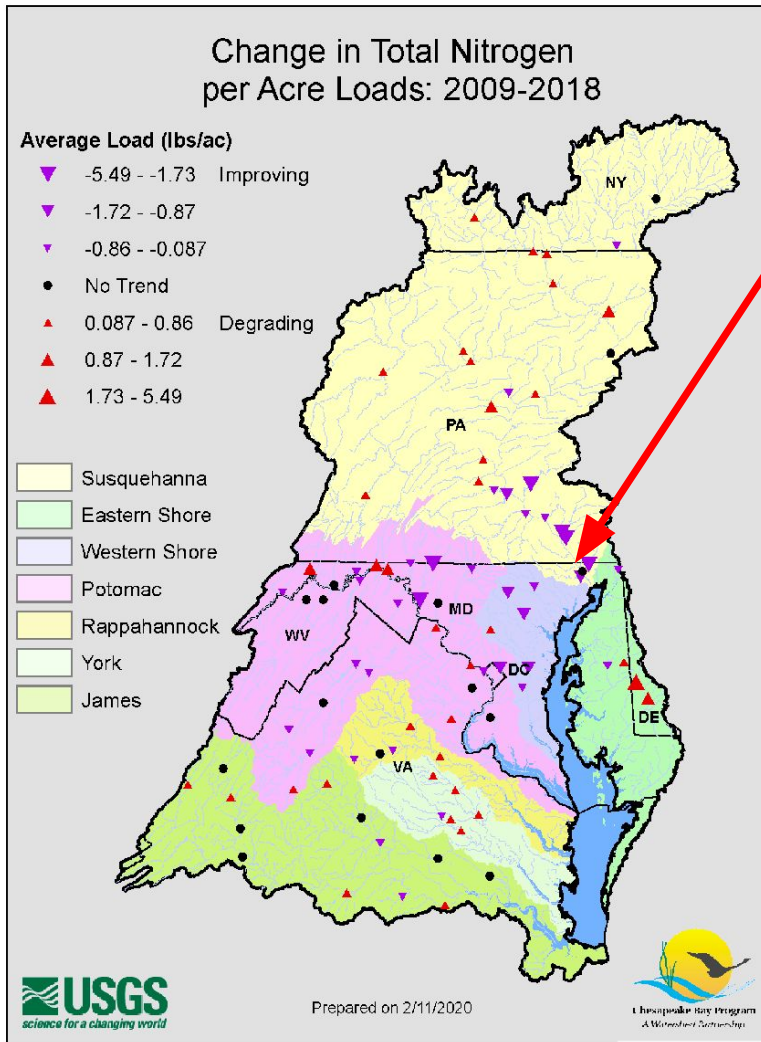
Chesapeake Bay TMDL Accounting

Monitored Trends in Loads and Water Quality

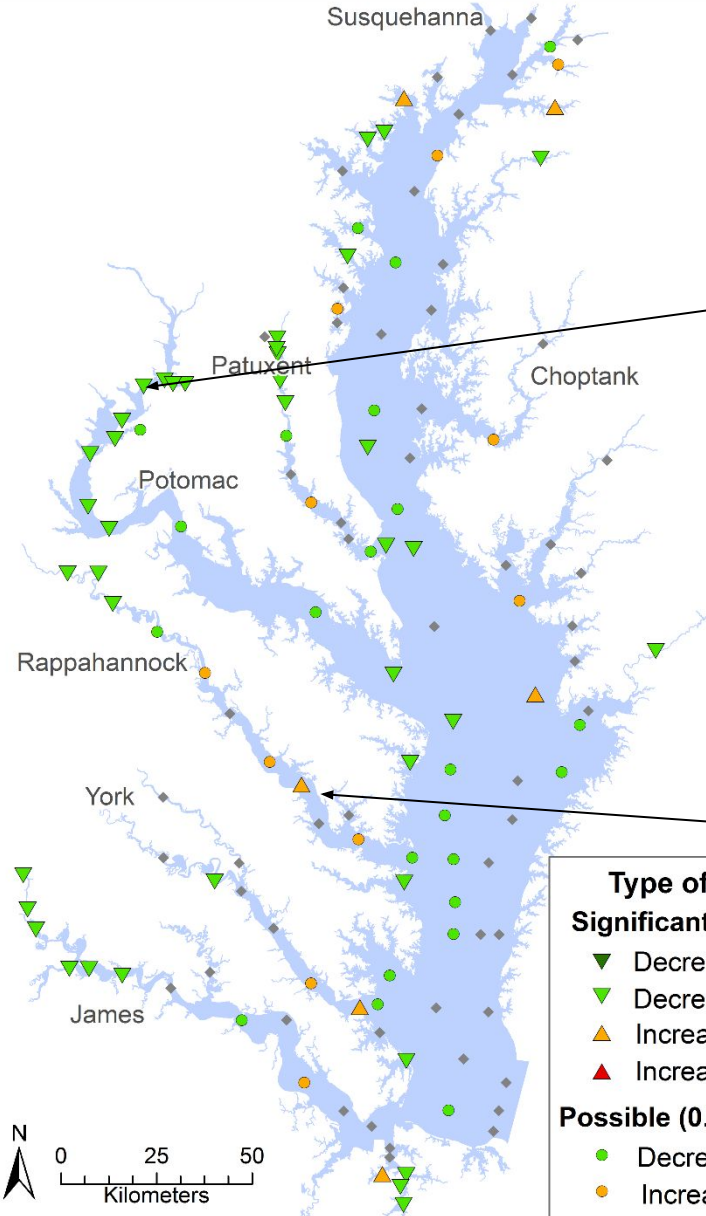


Chesapeake Bay TMDL Accounting

Monitored Trends in Loads and Water Quality



Trends for Surface Total Nitrogen in the Chesapeake Bay: 1999-2015



**Type of tre
Significant (p<**

- ▼ Decrease
- ▼ Decrease
- ▲ Increase
- ▲ Increase

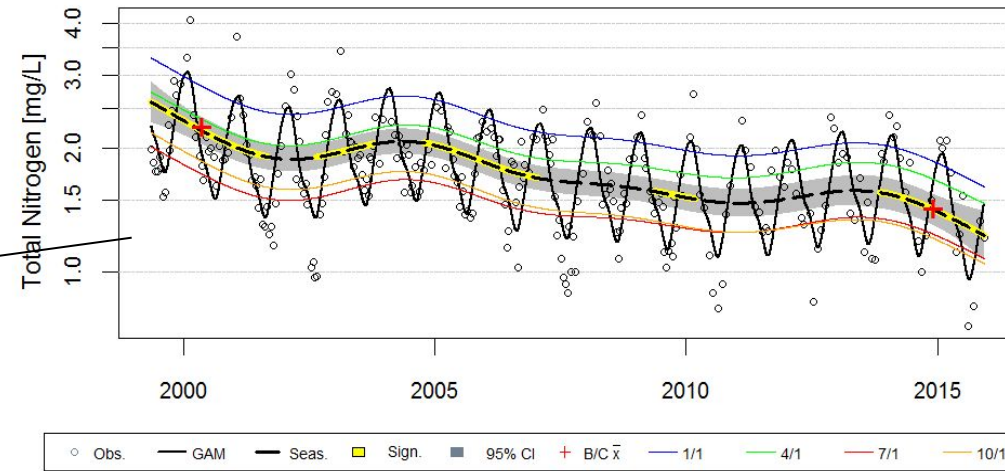
Possible (0.05<

- Decrease
- Increase

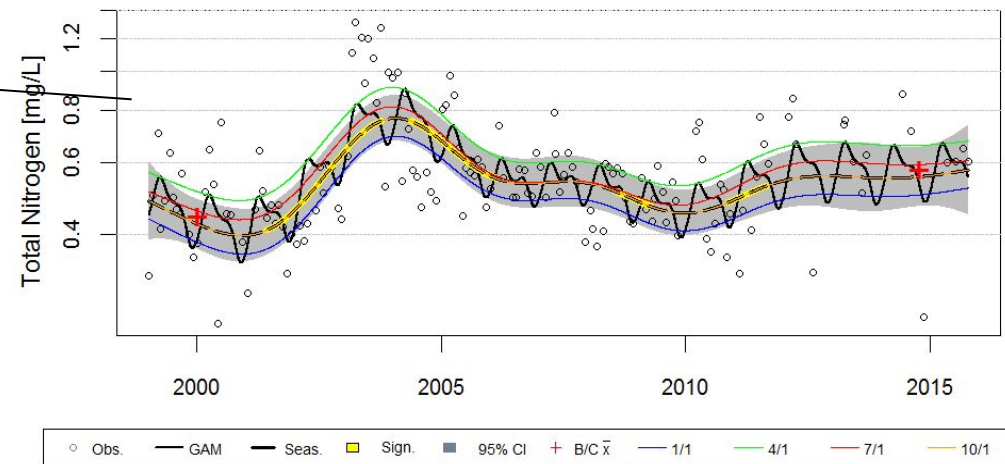
♦ Unlikely (p>0.25)

GAM Preliminary Results, Subject to Review

Total Nitrogen-Surface & Above Pycnocline at TF2.3



Total Nitrogen-Surface & Above Pycnocline at LE3.1



“Process through which agency partners ensure practices, treatments and technologies resulting in reductions of nitrogen, phosphorus and sediment pollutant loads are implemented and operating correctly.”

Chesapeake Bay Program Partnership

Commitment to Verification: October 2014

Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework



Chesapeake Bay Program BMP Verification

In 2011, the National Research Council of the National Academy of Sciences released a report with the following findings and conclusions about the Bay Program's BMP tracking and accounting efforts:

Chesapeake Bay Program BMP Verification

- The current accounting of BMPs is not consistent across the Bay jurisdictions.
 - Some source-sector BMPs are not tracked in all jurisdictions.
- The current accounting cannot on the whole be viewed as accurate.

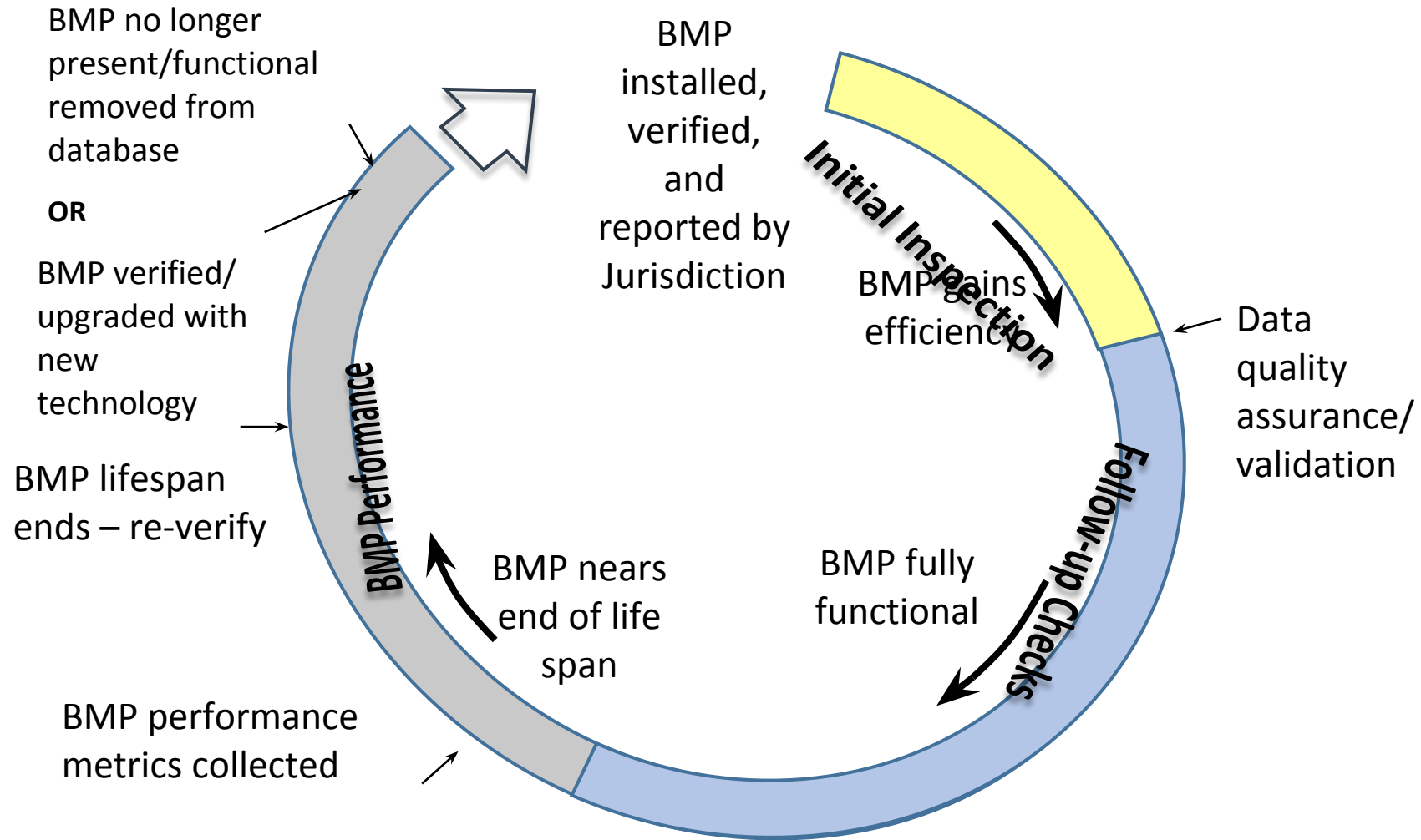
Chesapeake Bay Program BMP Verification

- The committee was unable to determine the reliability and accuracy of the BMP data reported by the Bay jurisdictions.
- The committee was not able to quantify the magnitude or the likely direction of the error introduced by BMP reporting issues.

Chesapeake Bay Program BMP Verification

- Verification programs should be structured with initial inspection – answering the question “is the BMP there?”
- Then follow-up checks carried out at the appropriate frequency to answer the question “is the BMP still there and operating? - throughout the lifespan of the practice.

The BMP Lifecycle



Chesapeake Bay Program BMP Verification

- Wealth of verification information at <https://www.chesapeakebay.net/what/programs/bmp> introduction to bmp verification

Chesapeake Bay Program BMP Verification

- 400+ unique practices approved by the Partnership for tracking, verification, reporting! . . . and, most importantly, pollutant load reductions
- Focus on high priority BMPs first

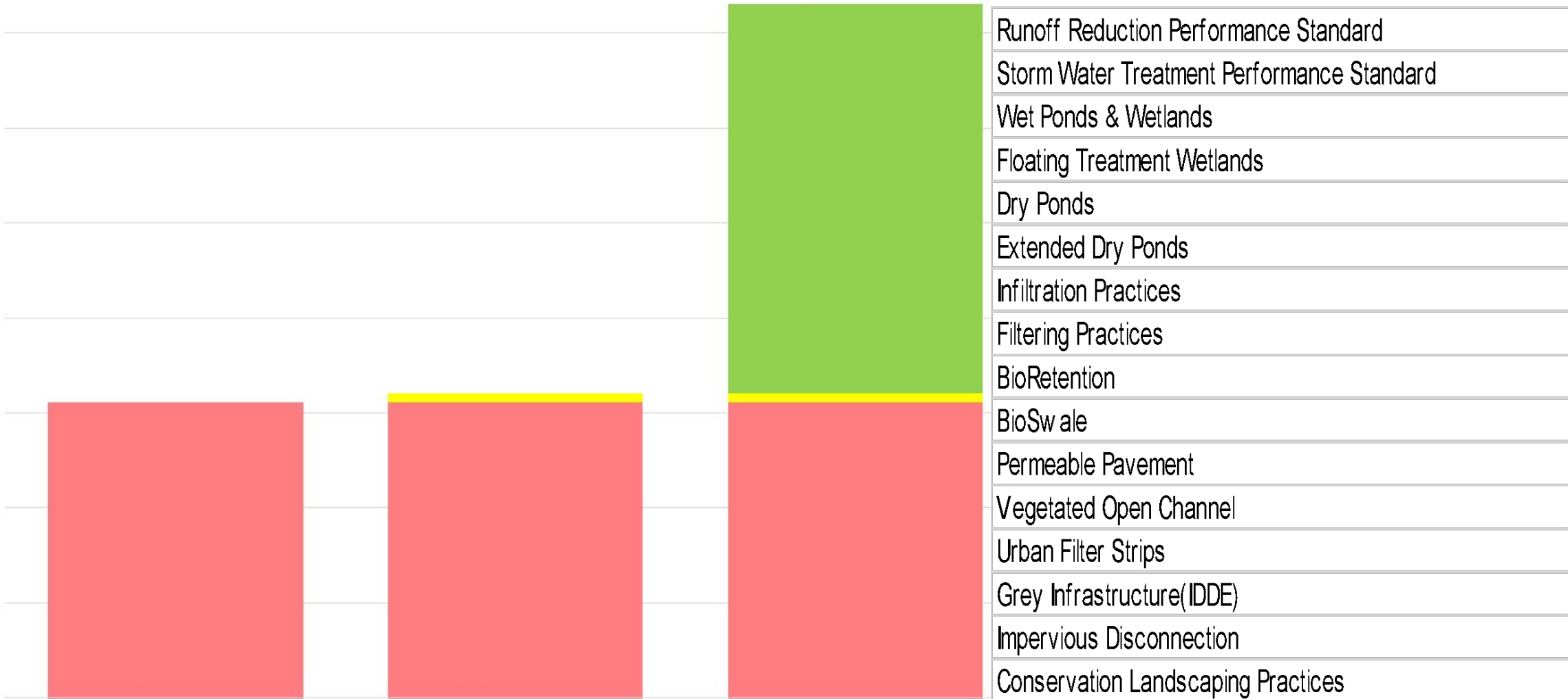
Chesapeake Bay Program BMP Verification Approaches

- Single-Year, Non-visual
- Single-Year, Visual
- Multi-Year, Visual
 - For example, investigations to be piggy-backed as part of routine stormwater BMP inspections required under local



➤ Implemented and Planned Stormwater Management

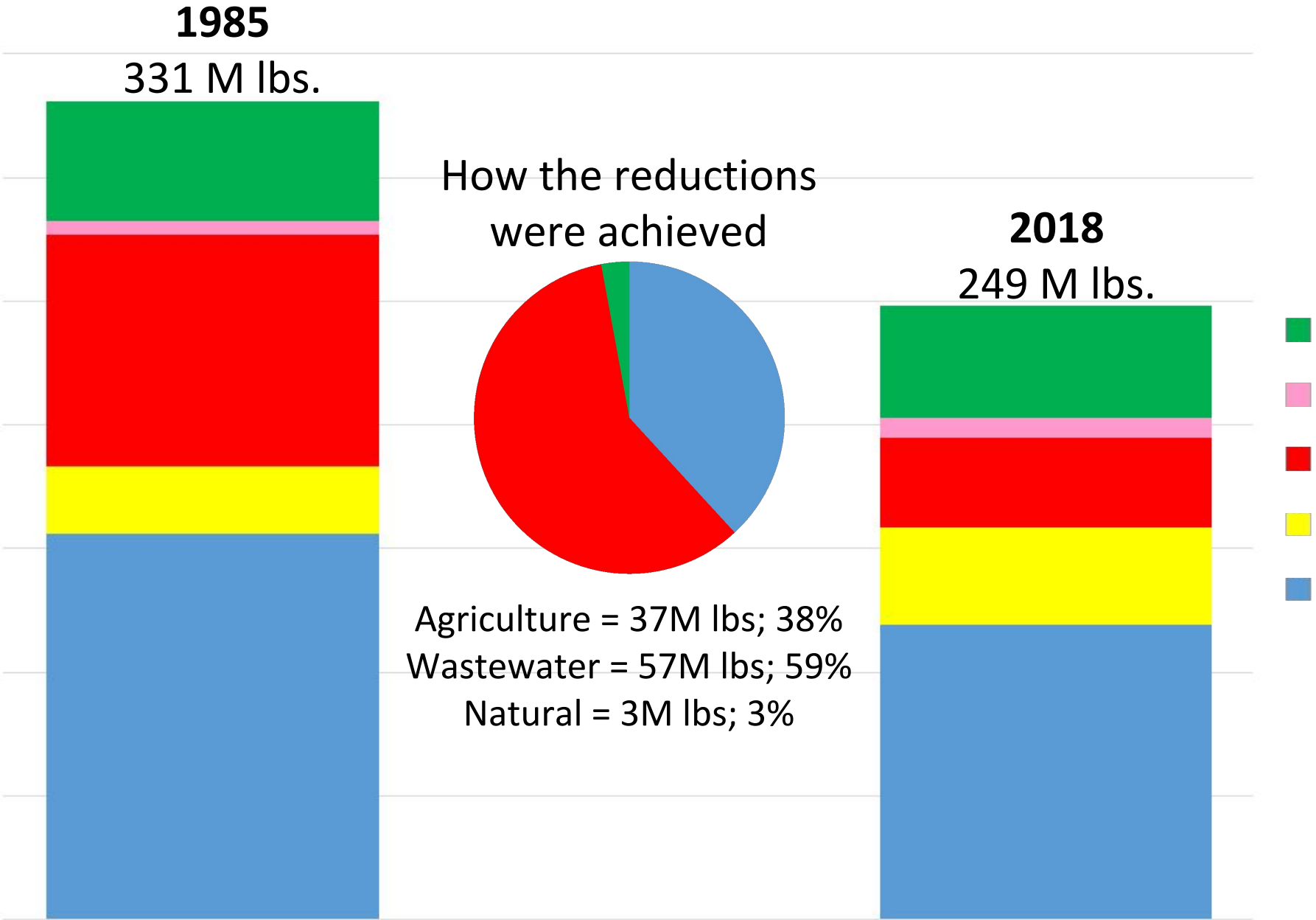
Chesapeake Bay Watershed



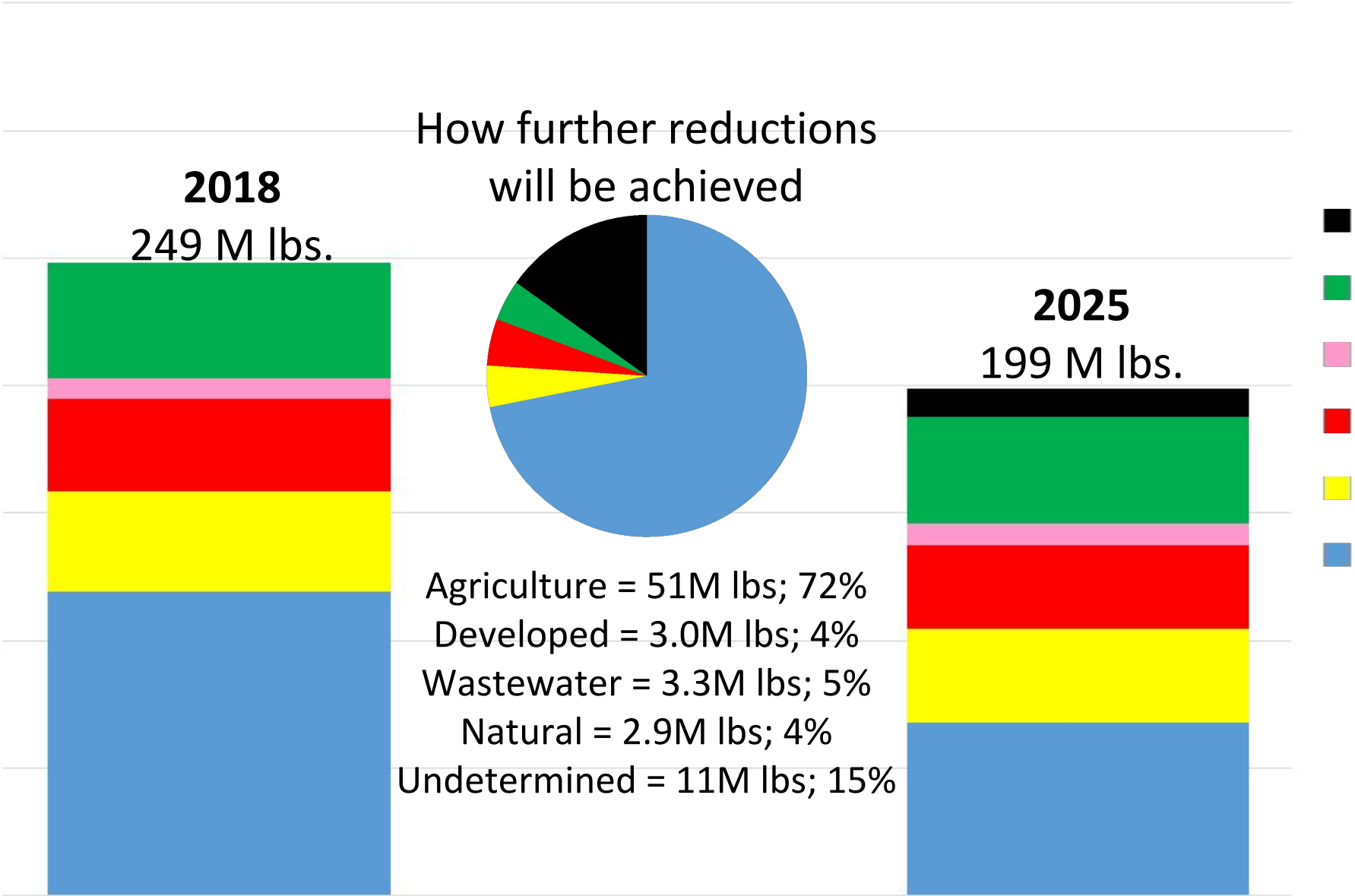
- Each BMP has a “credit-life”, part of verification programs established and agreed to by the Partnership
- BMPs are dropped from the cumulative record at the end of their credit-life unless reported as re-inspected and functioning – which resets the “credit” clock

- NRCS Practices – Model credit durations mirror NRCS Practice Lifespans
- Resource Improvement (RI) Practices – Shorter model credit durations

Chesapeake Bay Watershed Nitrogen Loads: 1985 – 2018

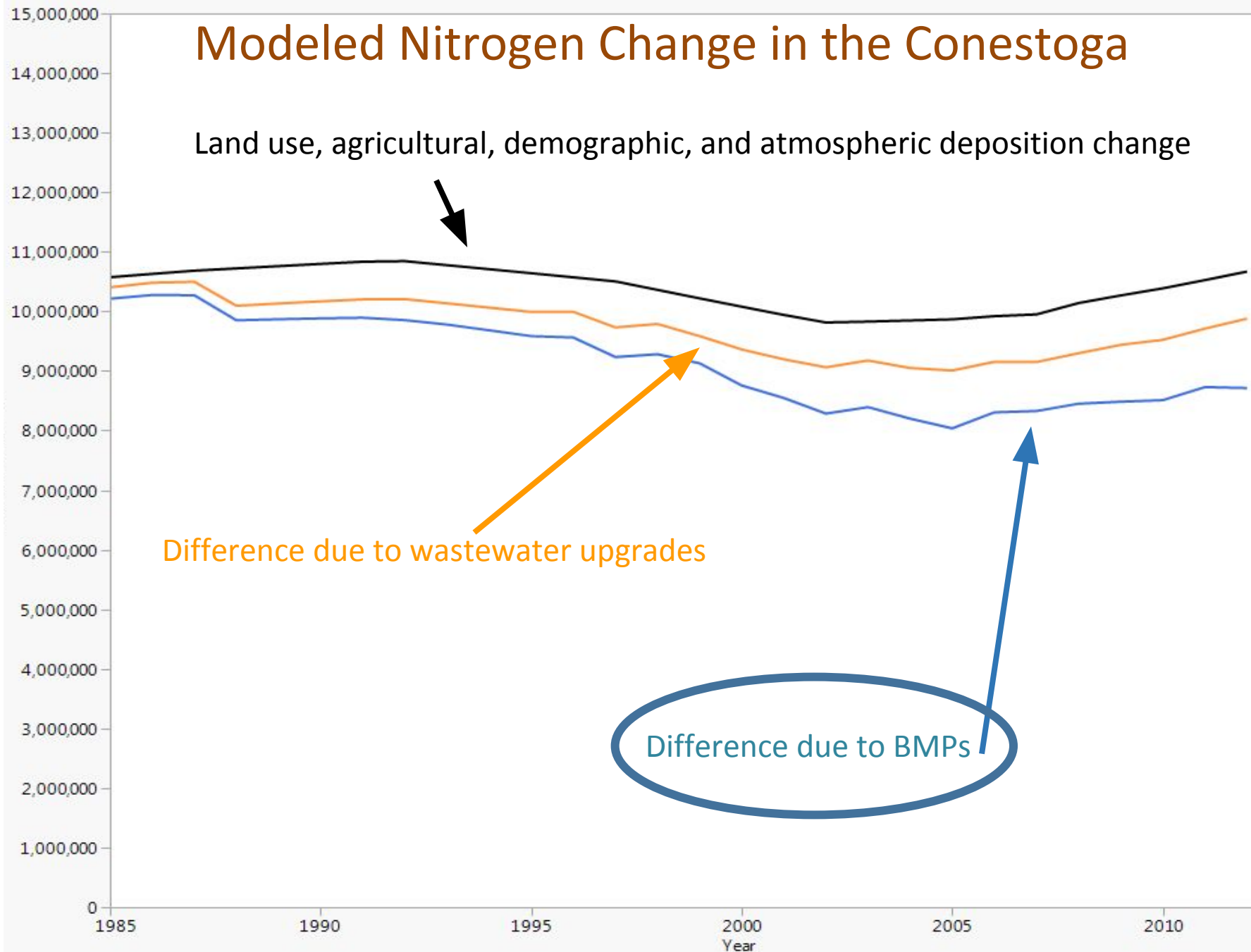


Chesapeake Bay Watershed Nitrogen Loads: 2018 – 2025



Modeled Nitrogen Change in the Conestoga

Land use, agricultural, demographic, and atmospheric deposition change



Jurisdictions' BMP Verification Program Plans

- National Research Council – Have written procedures in place for assuring the quality of the BMP data originating at local, regional, and federal agencies, and non-public organizations
 - Each jurisdiction now has a BMP Verification Program Plan – which follows protocols developed by the Partnership
 - Publicly available = transparent

Jurisdictions' BMP Verification Program Plans

- QAPP needs to describe how, exactly, reported compliance levels are accounted for and calculated for each type of Nutrient Management (core and supplemental, both N- and P-based)
- How are raw data used and calculations done to determine the degree to which landowners are following their plans?

Jurisdictions' BMP Verification Program Plans

- EPA is looking for improvements over time of on-the-ground inspection and maintenance programs

Chesapeake Bay Program BMP Verification

- National Research Council was unable to determine the reliability and accuracy of the BMP data reported by the Bay jurisdictions.

Chesapeake Bay Program BMP Verification

- BMP data is received December 1
- CBP office does verification analysis and transmits findings to jurisdictions
- Jurisdictions respond to verification questions and requests

Chesapeake Bay Program BMP Verification

- Jurisdictions/data sources are asked to explain the quality of particular data that potentially could be over- or under-reported or BMP project information was illogical
- Same rules are applied to every BMP and every jurisdiction

Chesapeake Bay Program BMP Verification

- BMP projects and/or verification are to specify new implementation, inspection, maintenance, or retirement wherever the information is available

Chesapeake Bay Program BMP Verification

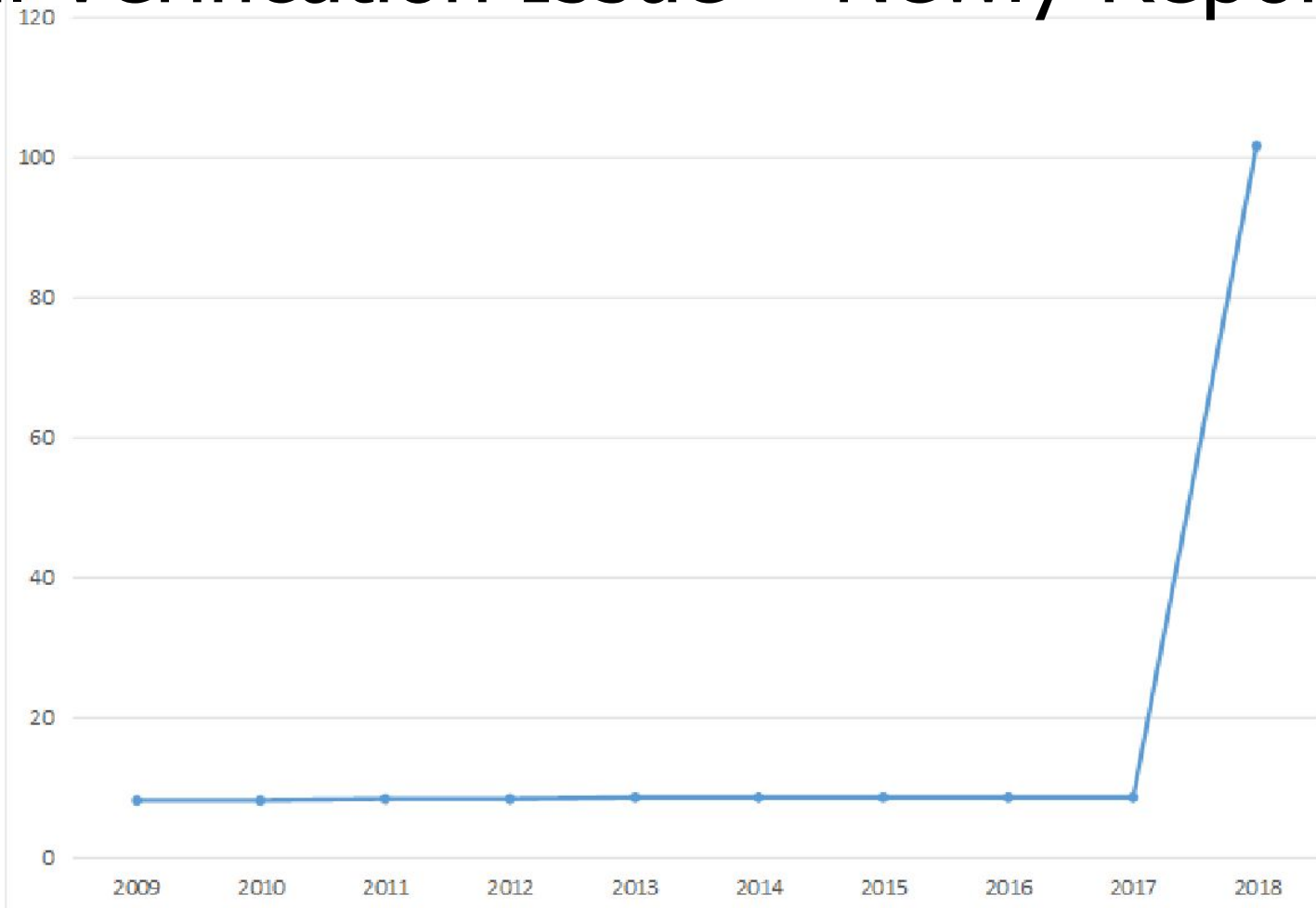
- EPA is looking at jurisdiction-wide nutrient loads by major source since TMDL and asks for comments on what the jurisdiction attributes significant ($>2\%$) increases and decreases to
- Similar analyses had been used for 15+ years by the CBP office, typically with less-formal exchanges

Chesapeake Bay Program BMP Verification

- CBPO is primarily looking for the following:
 - Implementation rates that greatly exceed historic rates
 - Missing BMPs – compared to the history
 - Illogical implementation and re-inspection dates
 - BMPs with no or inadequate descriptions in the QAPP = little understanding of the quality of the data

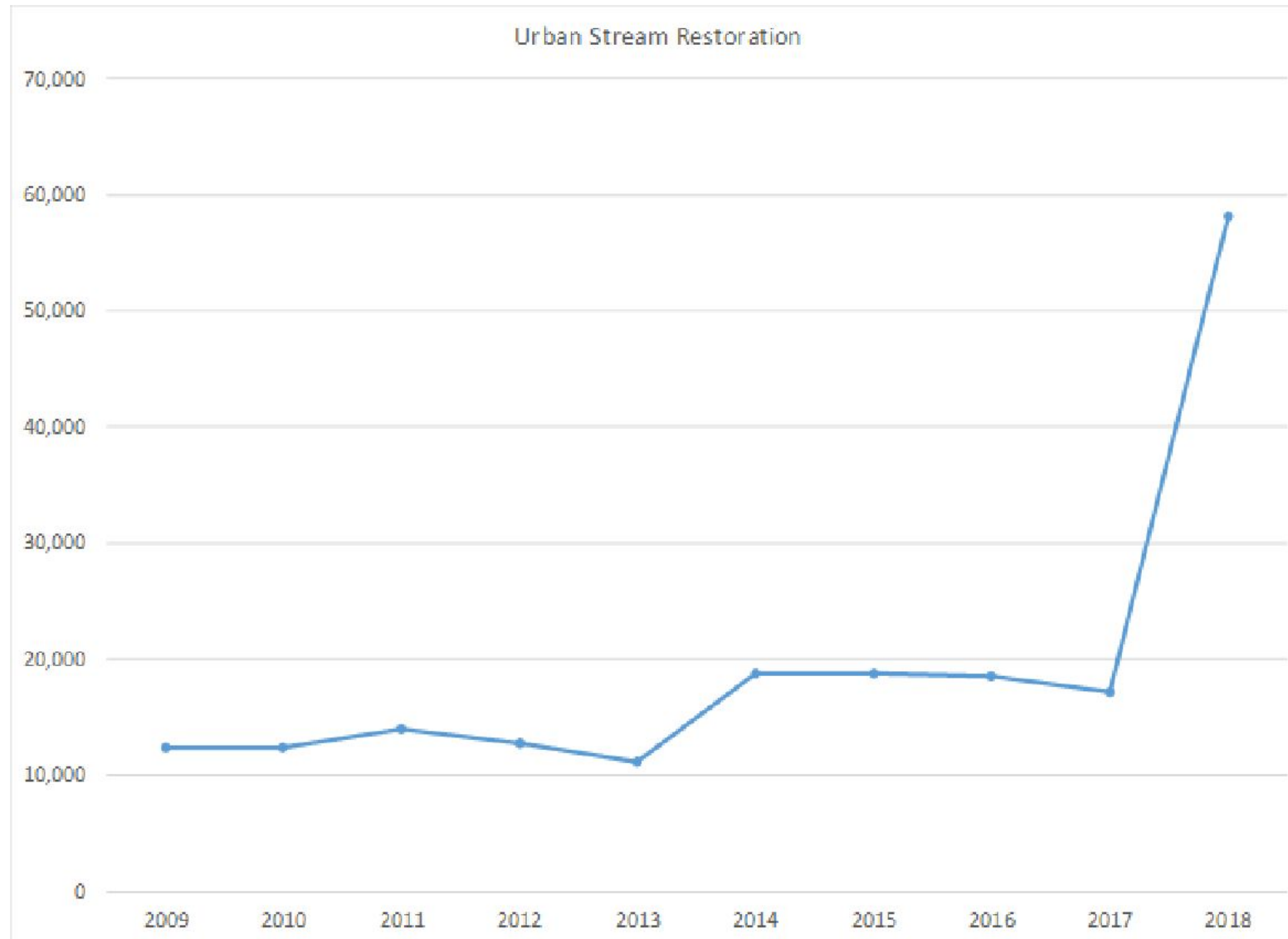
Chesapeake Bay Program BMP Verification

- Potential Verification Issue – Newly Reported BMPs



- Potential Verification Issues – Over-Reporting
 - BMPs where the reported short-term rate of implementation is more than double the long-term rate
 - There are only water quality improvements if new implementation represents stronger programs, new funding source, not new numbers in a model where implementation is old.

Chesapeake Bay Program BMP Verification

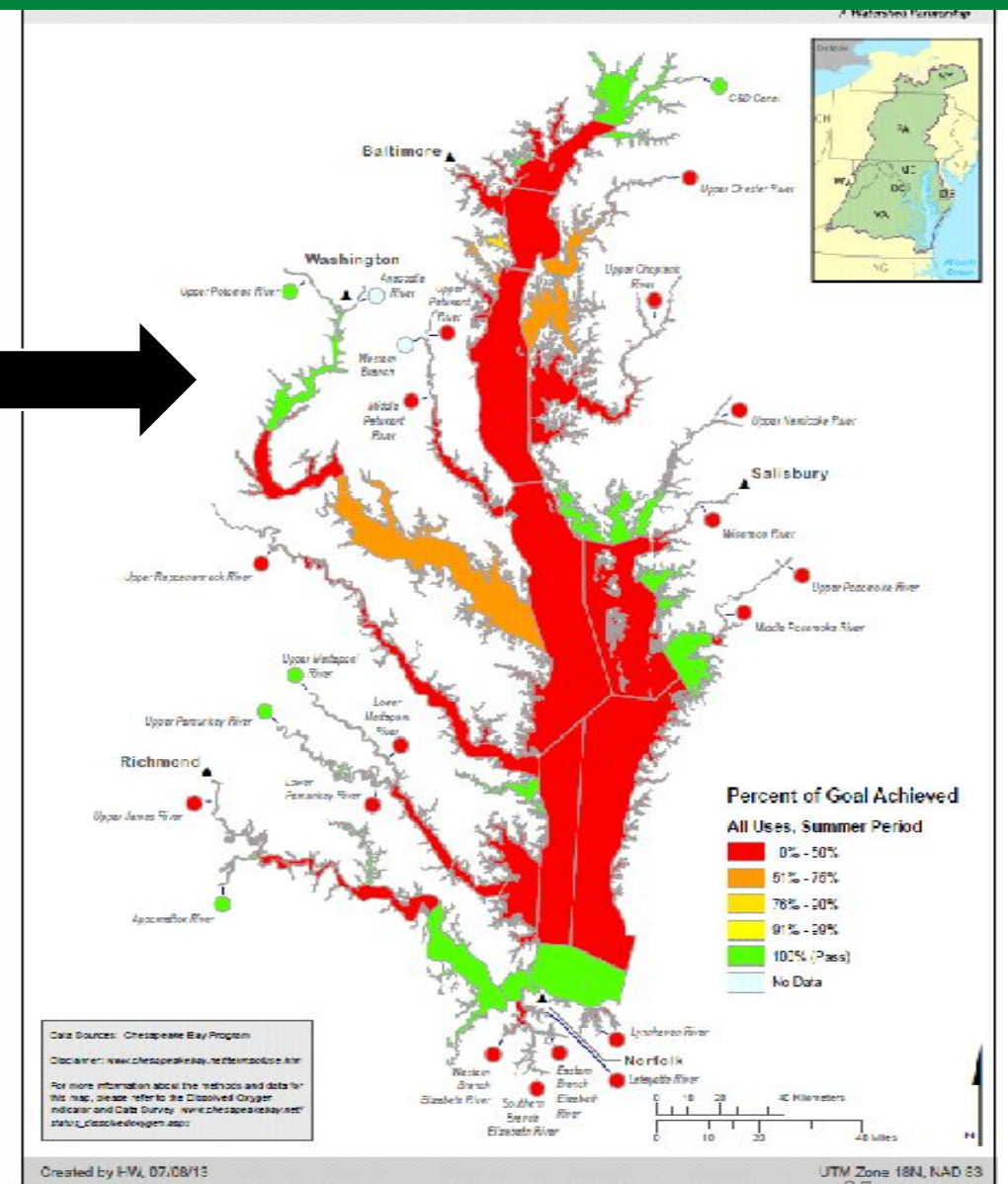


Chesapeake Bay Program BMP Verification

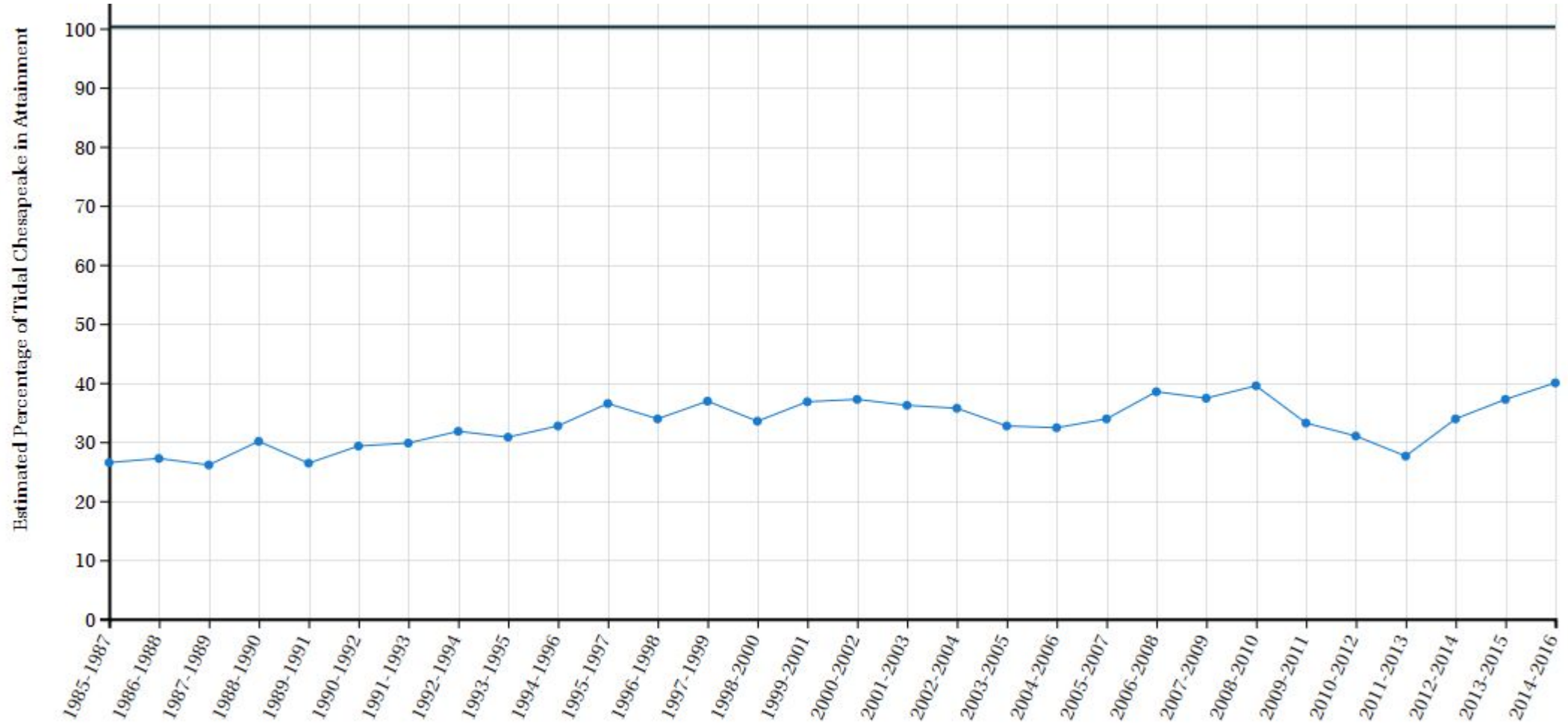
- Potential Verification Issue – Reported Dates of Installation, Inspection, Maintenance
 - Significant number of reported projects were installed and/or inspected on the same day.

Chesapeake Bay Impairments

- Dissolved Oxygen
 - Chlorophyll a
 - Water Clarity
- (SAV Abundance)



Water Quality Standards Attainment



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