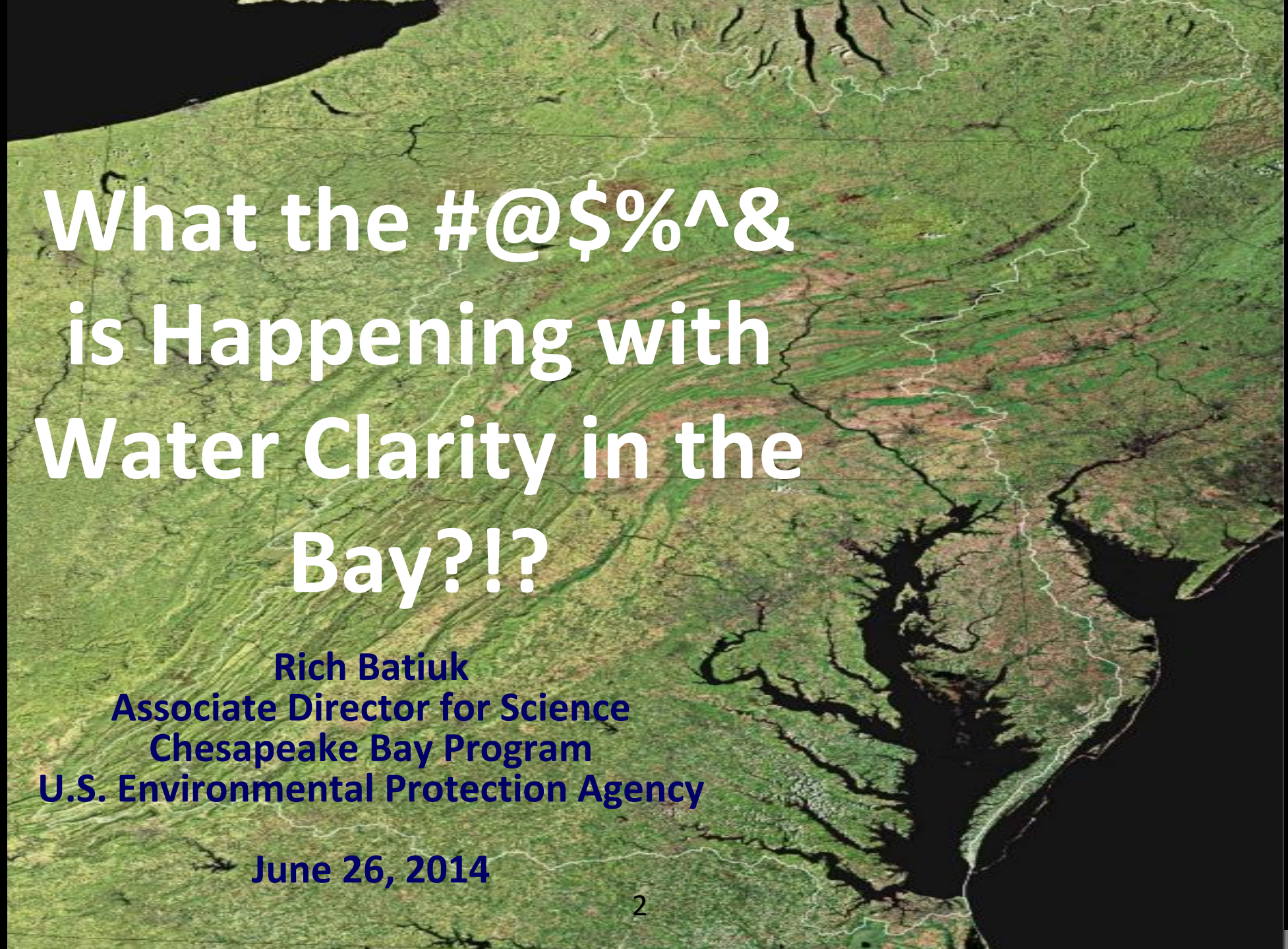
Motivation for the Synthesis

Rich Batiuk
Associate Director for Science
Chesapeake Bay Program
U.S. Environmental Protection Agency

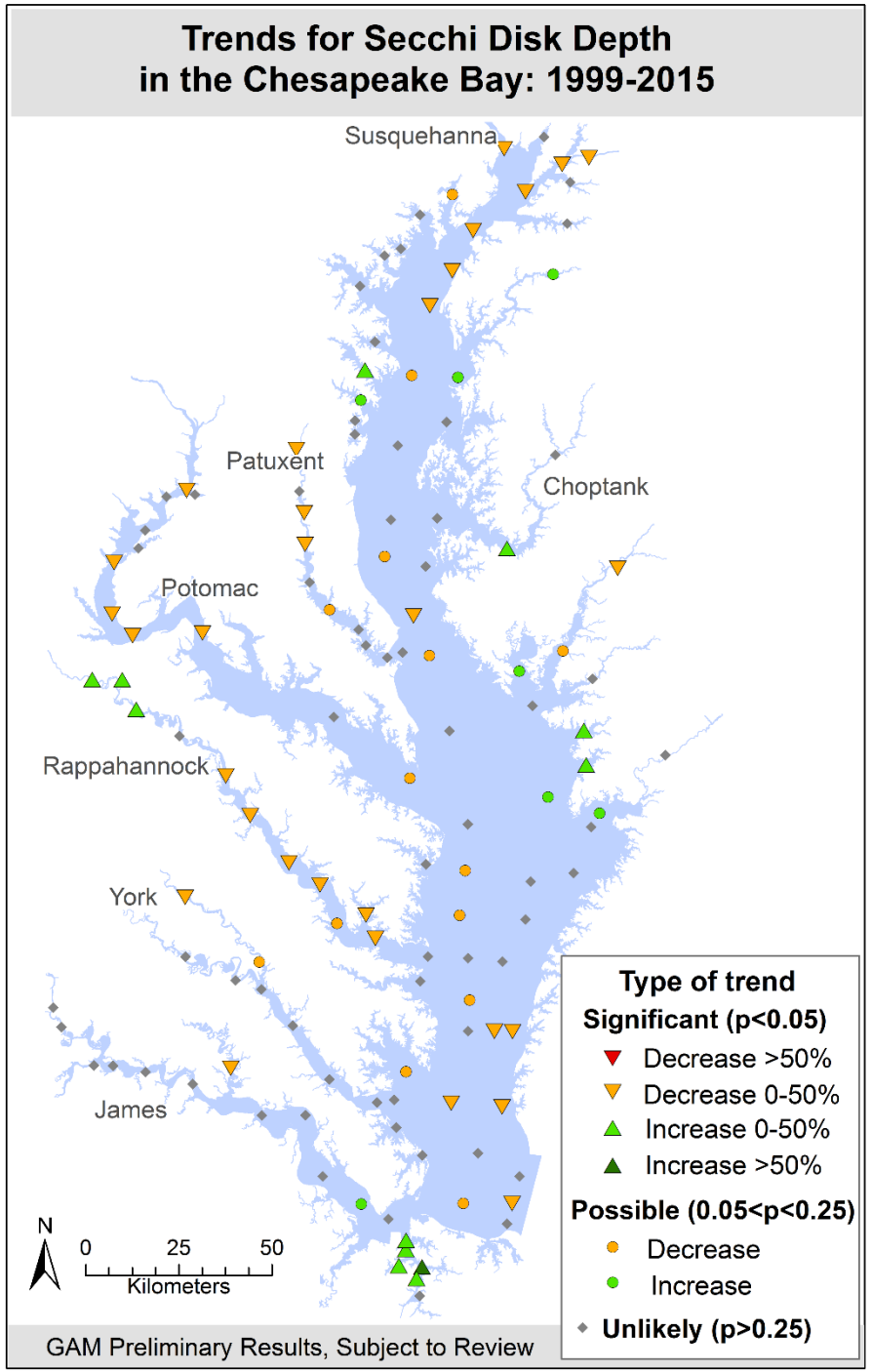
June 26, 2014



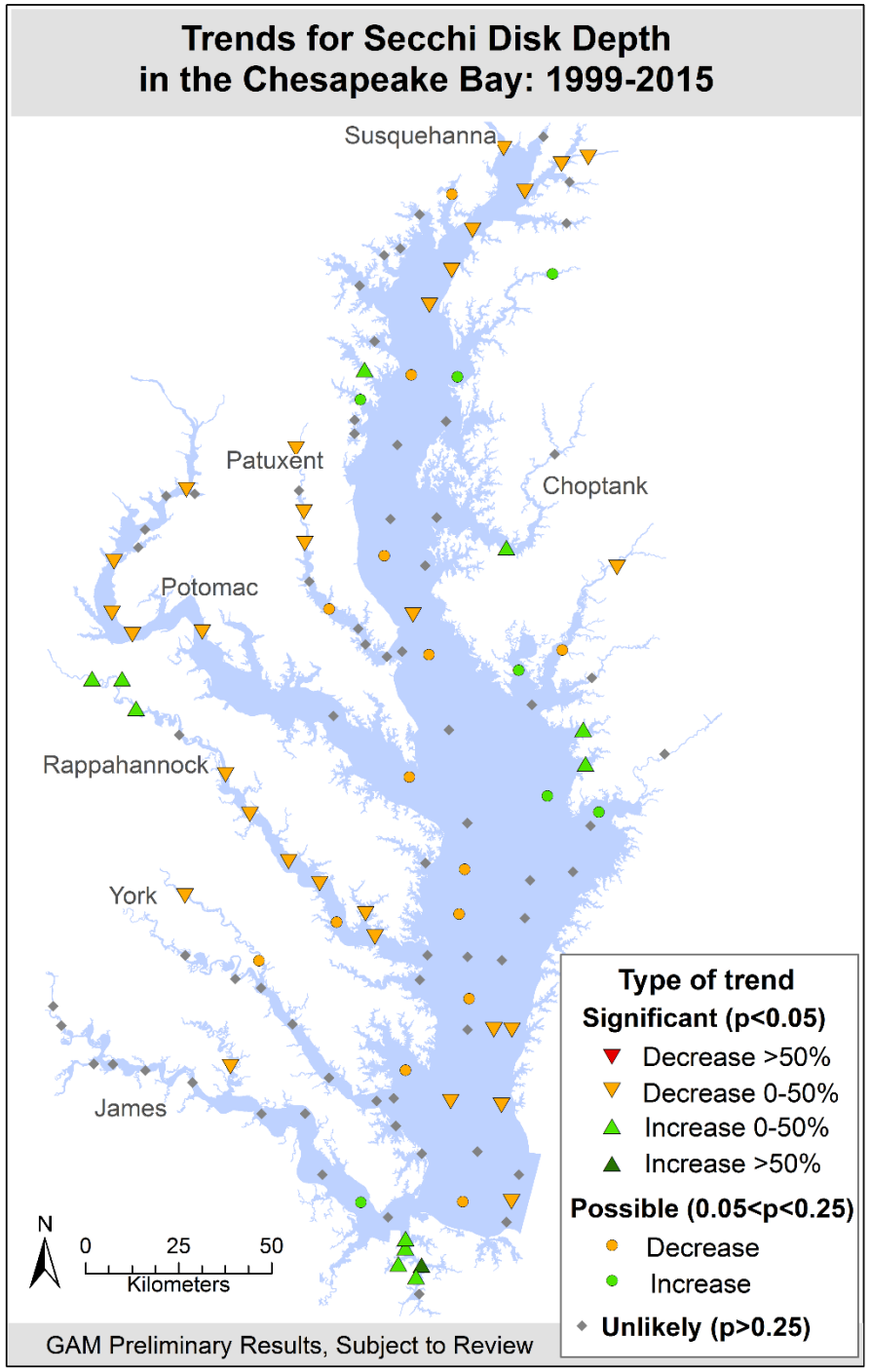
What the #@$%^& is Happening with Water Clarity in the Bay?!?

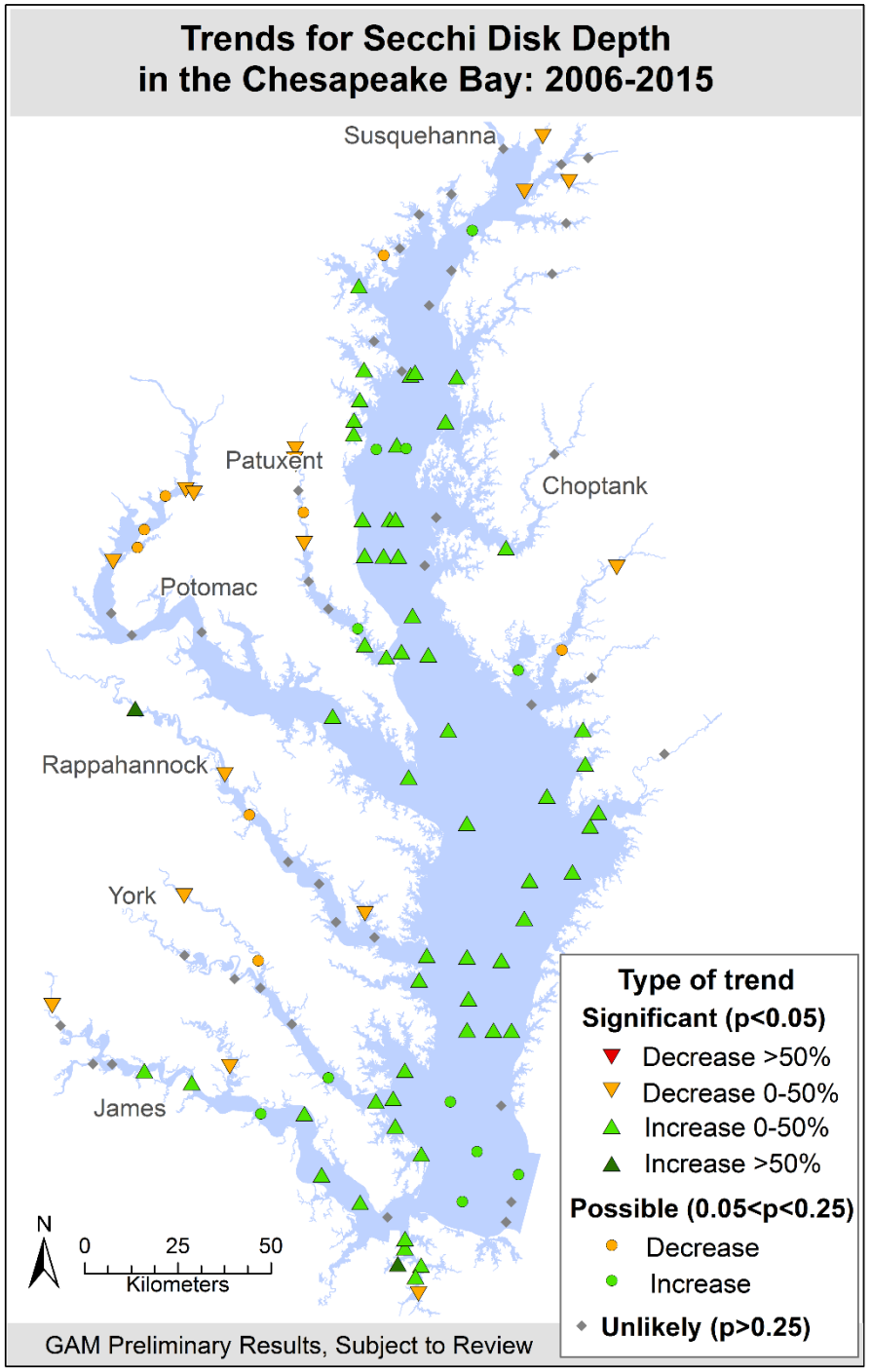
Rich Batiuk
Associate Director for Science
Chesapeake Bay Program
U.S. Environmental Protection Agency

June 26, 2014

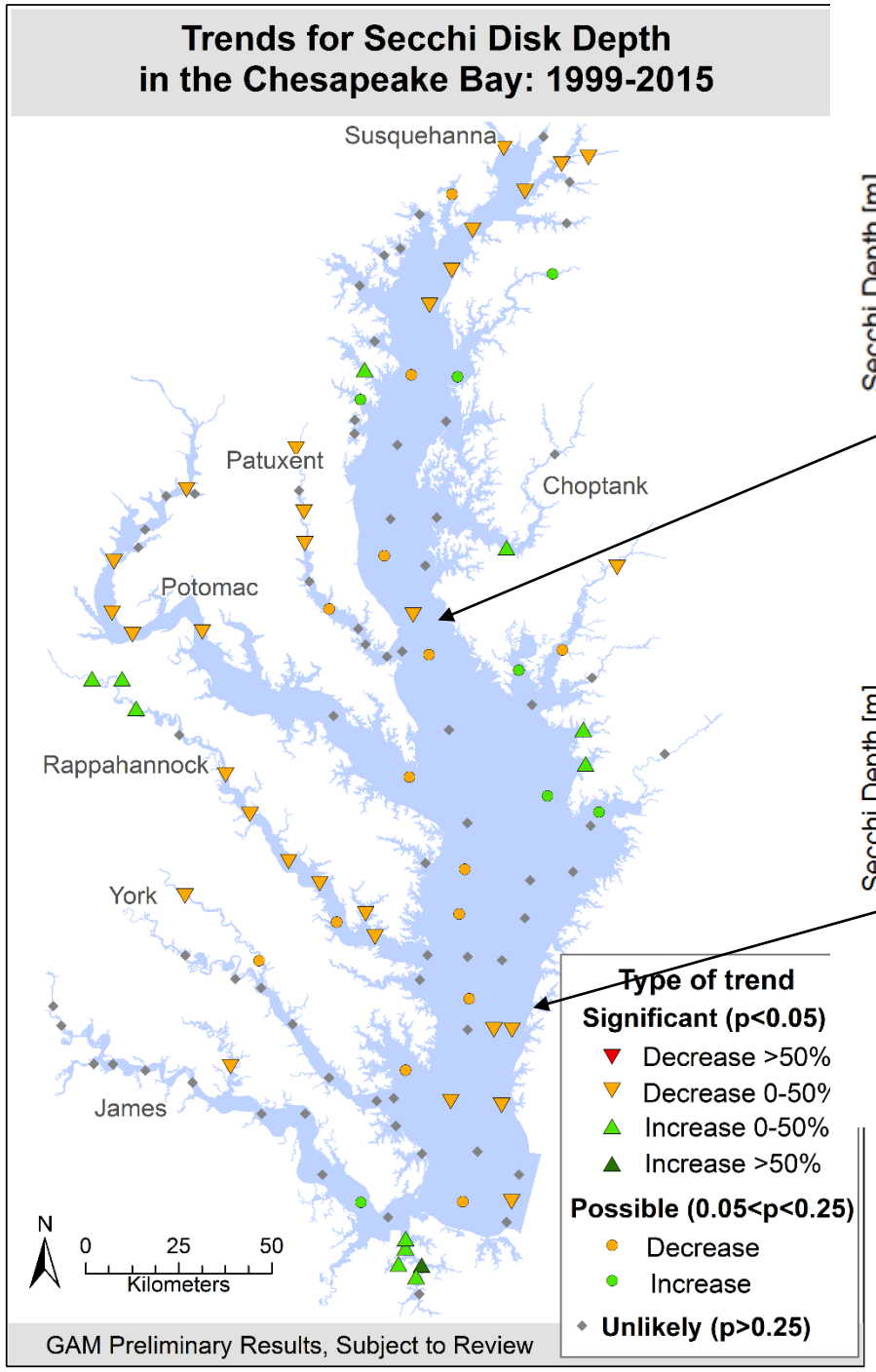

Trends for Secchi Disk Depth
in the Chesapeake Bay: 1999-2015
Susquehanna
Patuxent
Choptank
Potomac
Rappahannock
York
James
N
0
25
50
Kilometers
Type of trend
Significant (p<0.05)
Decrease >50%
Decrease 0-50%
Increase 0-50%
Increase >50%
Possible (0.05<p<0.25)
Decrease
Increase
Unlikely (p>0.25)
GAM Preliminary Results, Subject to Review

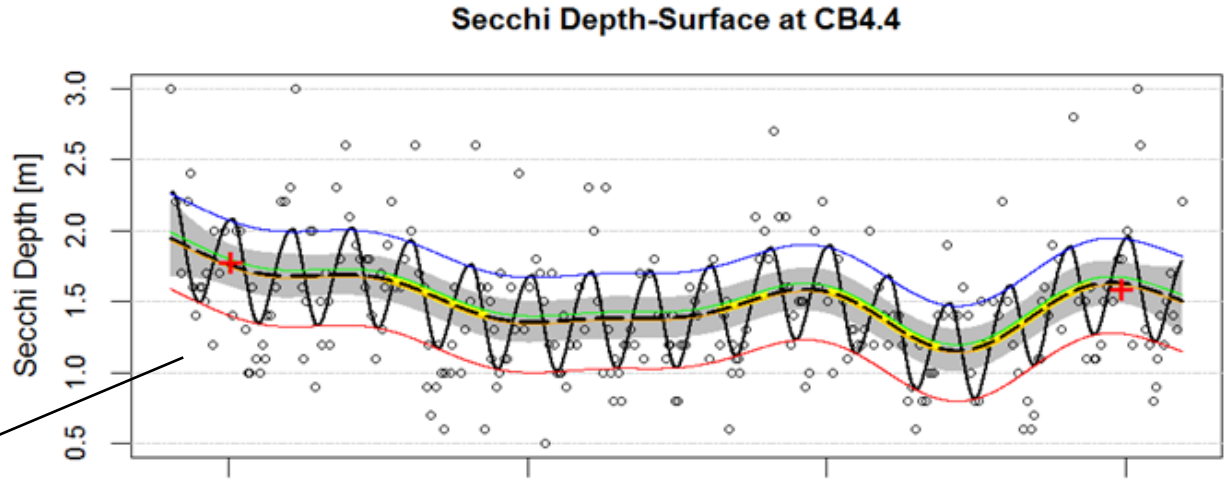
Why are we witnessing declining trends or no trends in water clarity against the backdrop of decades of BMP implementation and dramatic reductions in wastewater and atmospheric deposition loads?

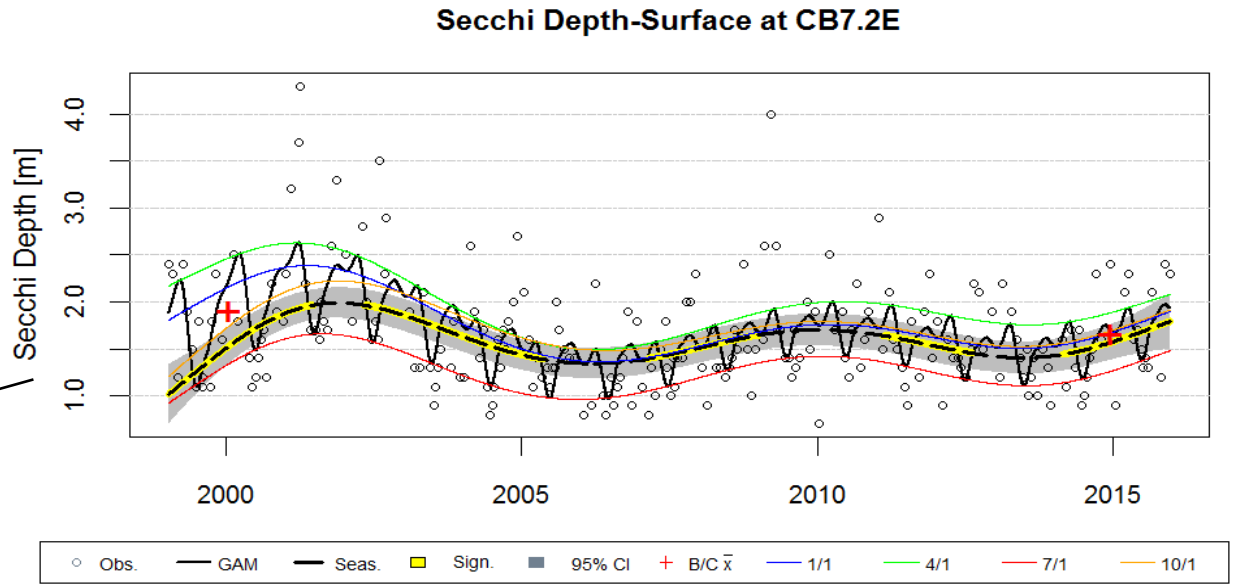

Trends for Secchi Disk Depth
in the Chesapeake Bay: 1999-2015
Susquehanna
Patuxent
Choptank
Potomac
Rappahannock
York
James
N
0
25
50
Kilometers
Type of trend
Significant (p<0.05)
Decrease >50%
Decrease 0-50%
Increase 0-50%
Increase >50%
Possible (0.05<p<0.25)
Decrease
Increase
Unlikely (p>0.25)
GAM Preliminary Results, Subject to Review


Trends for Secchi Disk Depth
in the Chesapeake Bay: 2006-2015
Susquehanna
Patuxent
Choptank
Potomac
Rappahannock
York
James
N
0
25
50
Kilometers
Type of trend
Significant (p<0.05)
Decrease >50%
Decrease 0-50%
Increase 0-50%
Increase >50%
Possible (0.05<p<0.25)
Decrease
Increase
Unlikely (p>0.25)
GAM Preliminary Results, Subject to Review

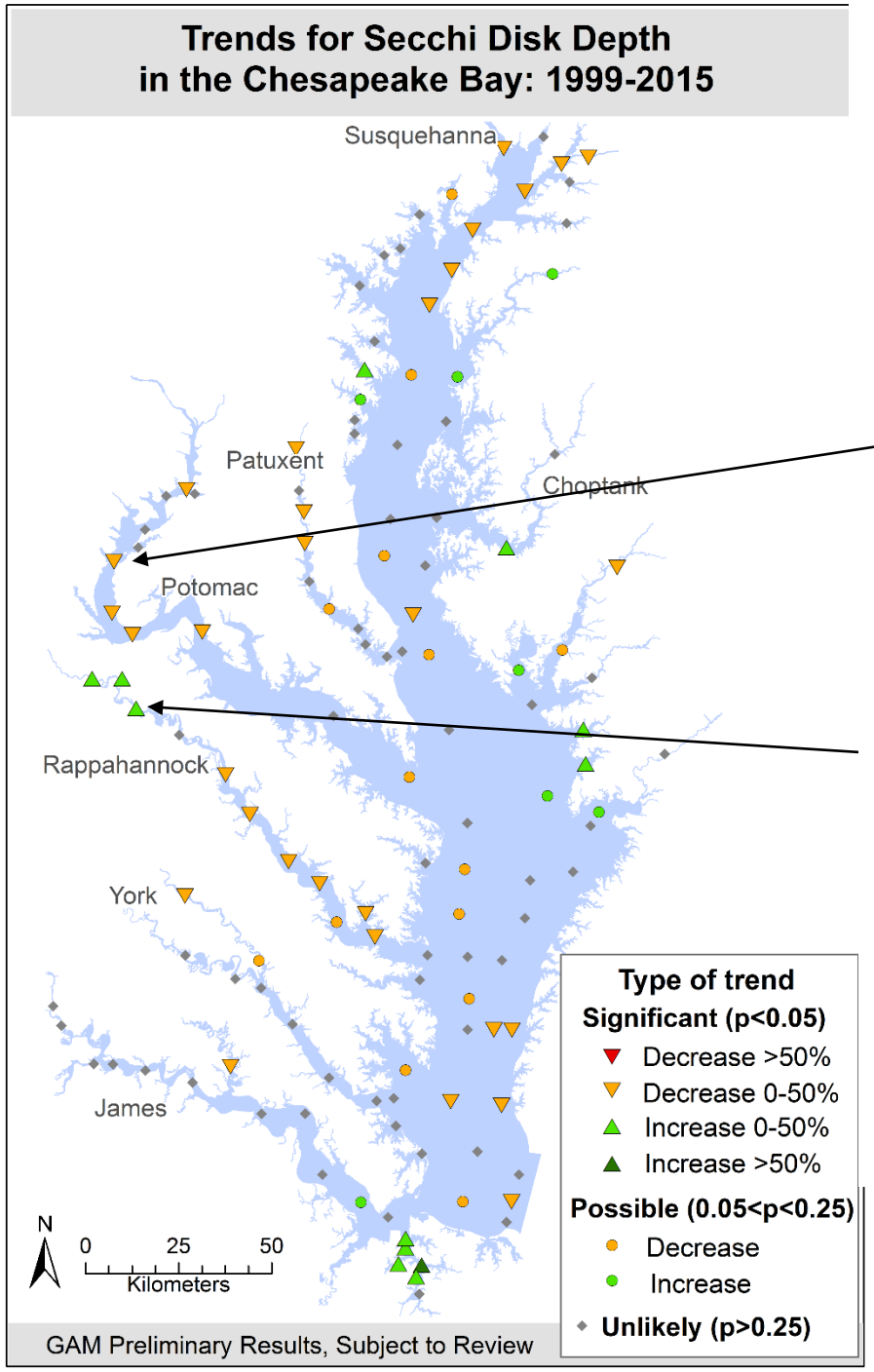
What has happened in the past decade that has lead to the widespread increases in water clarity particularly in the mainstem Bay?

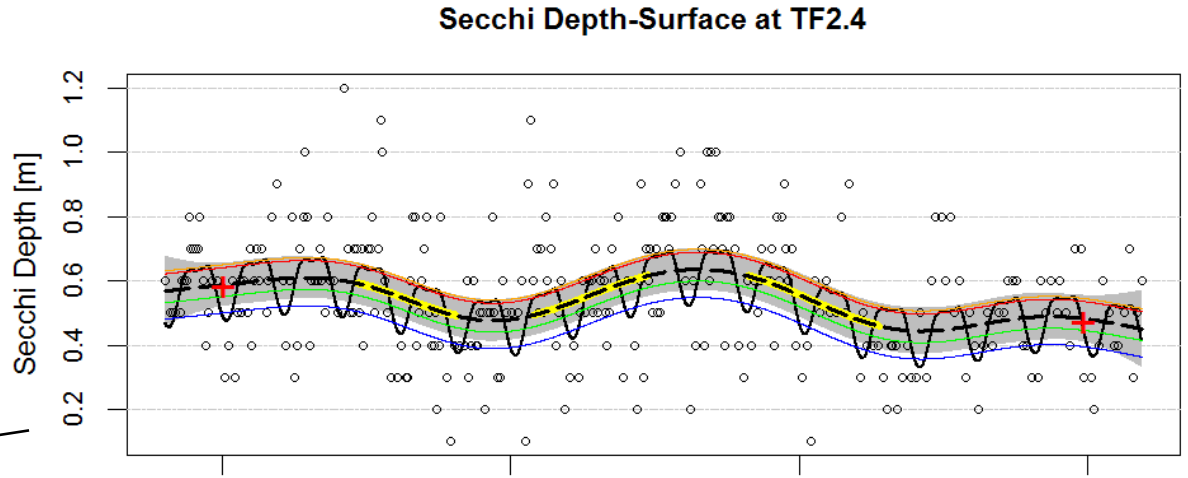


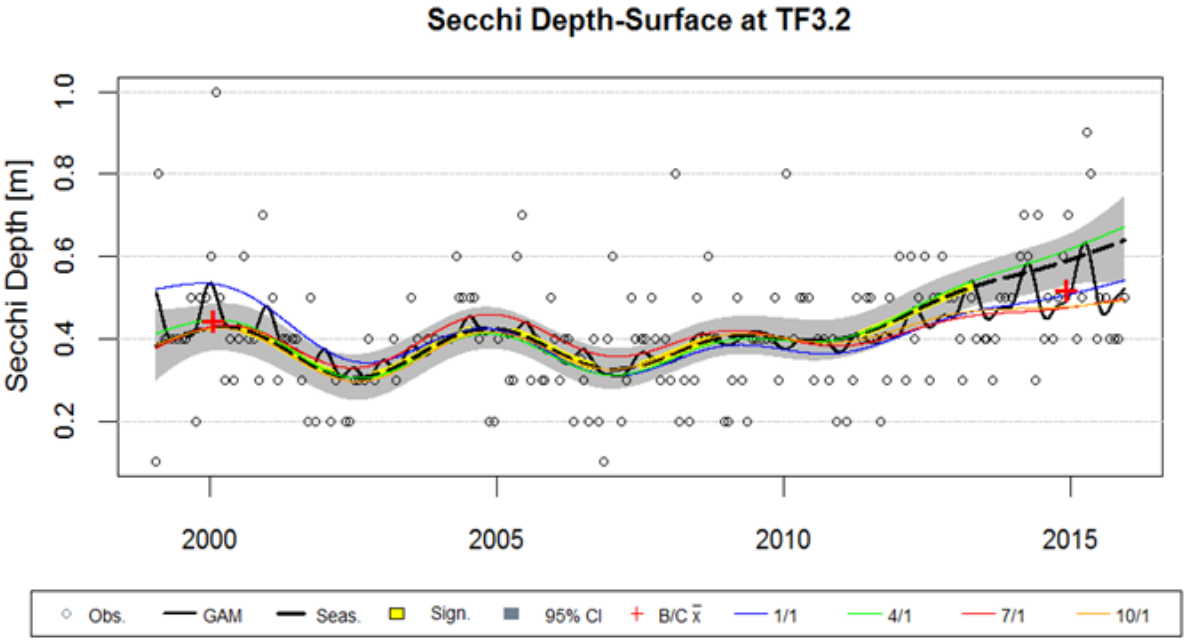




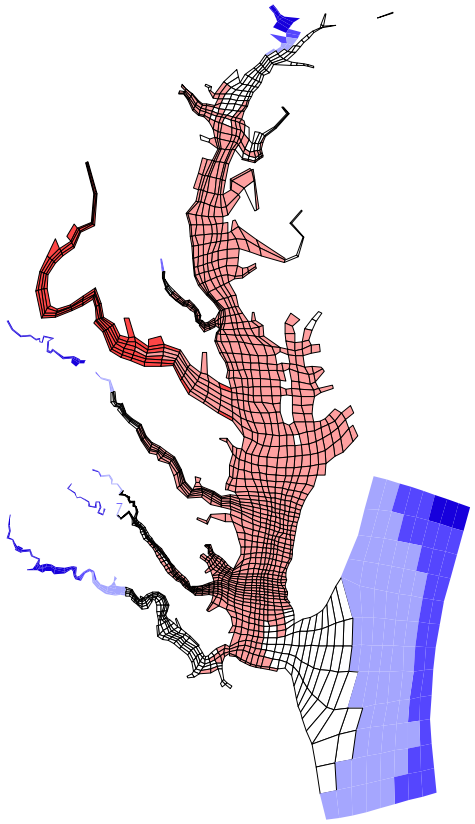
Two main bay time series demonstrate the long-term decrease from 1999, but that a slight up-swing in the last few years has resulted in the 10 year improving trend.

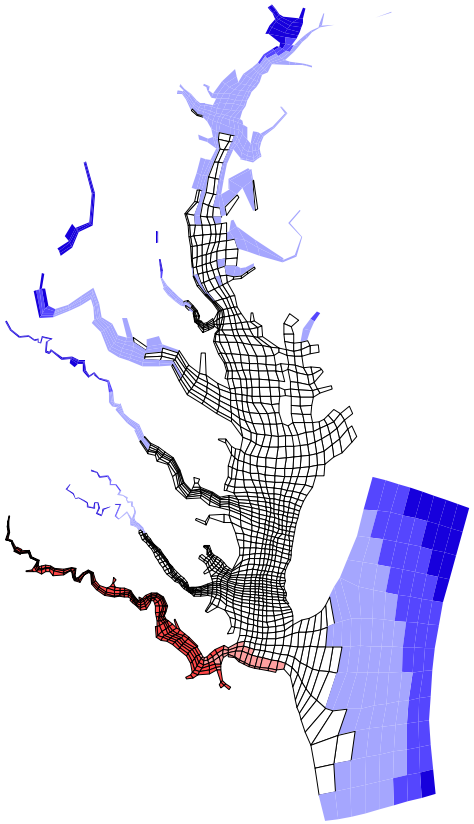


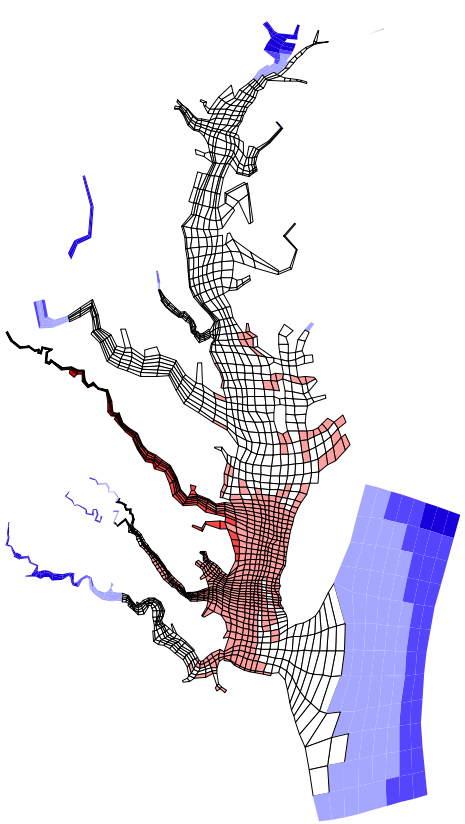


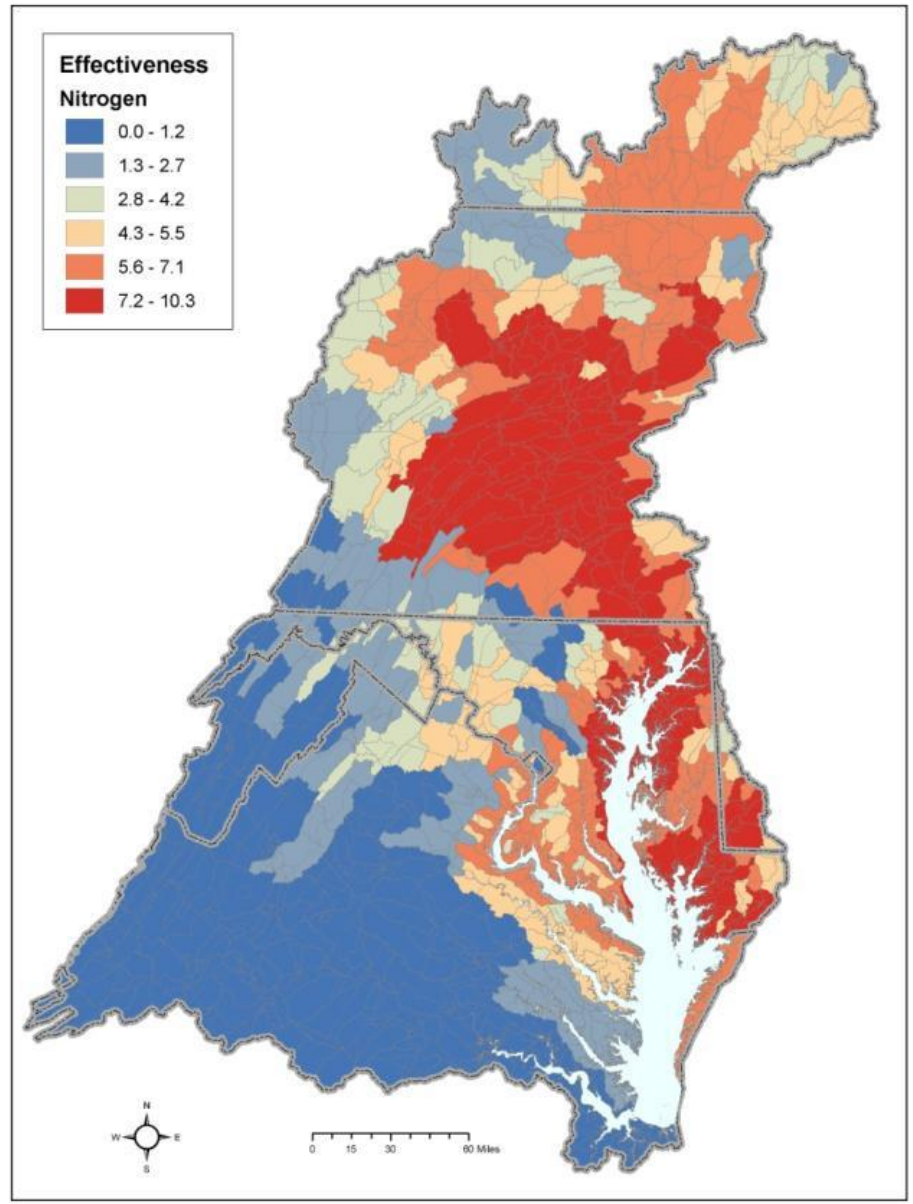


Two different tidal fresh tributary stations demonstrate a recent degradation (Potomac) and improvement (Rappahannock).







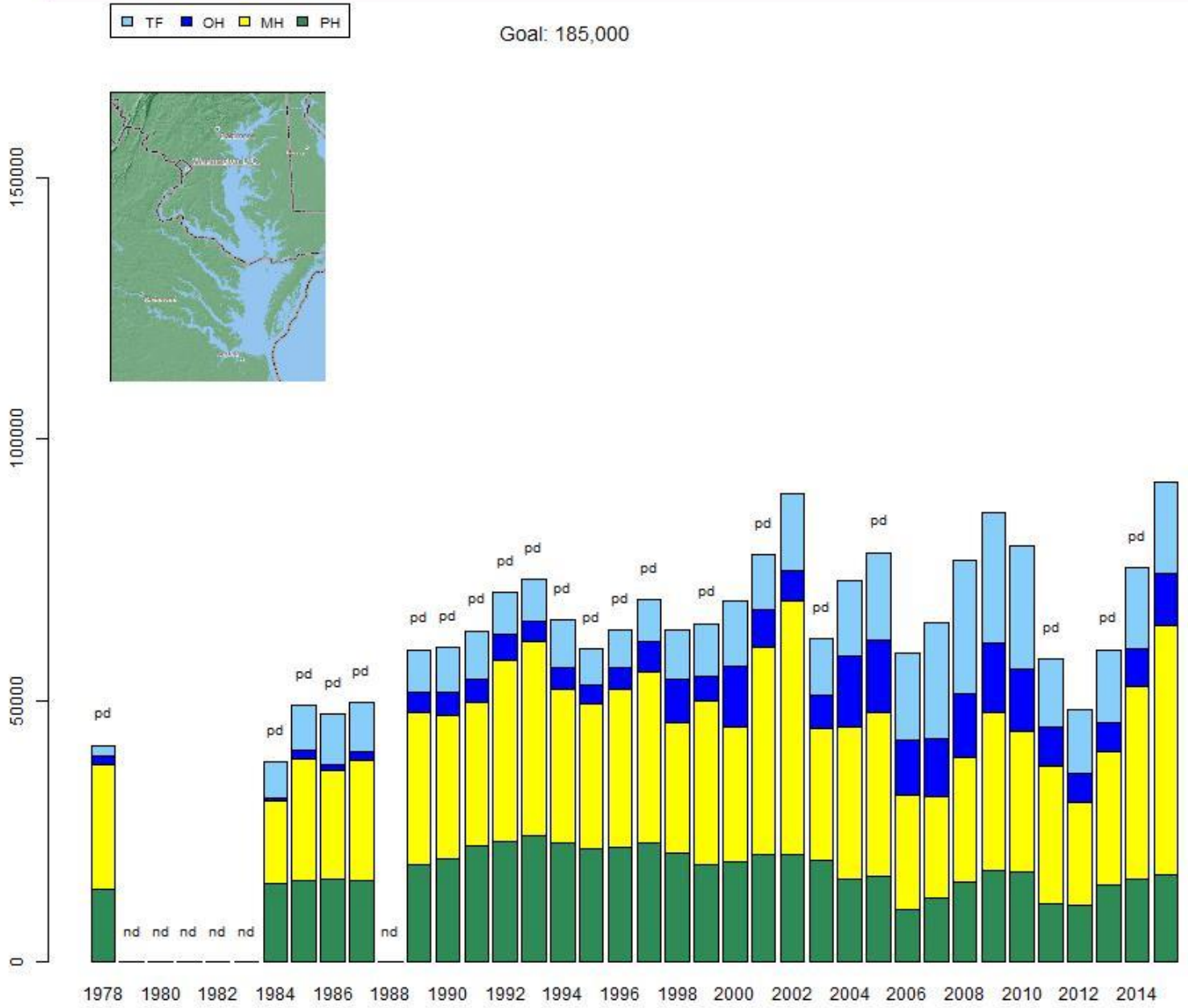

Effectiveness
Nitrogen
0.0 - 1.2
1.3 - 2.7
2.8 - 4.2
4.3 - 5.5
5.6 - 7.1
7.2 - 10.3
N
W
E
S
0
15
30
60 Miles

Can we quantitatively connect the dots to tell the upland➡stream➡river➡Bay➡clarity story?

Tidal shoreline➡clarity story?

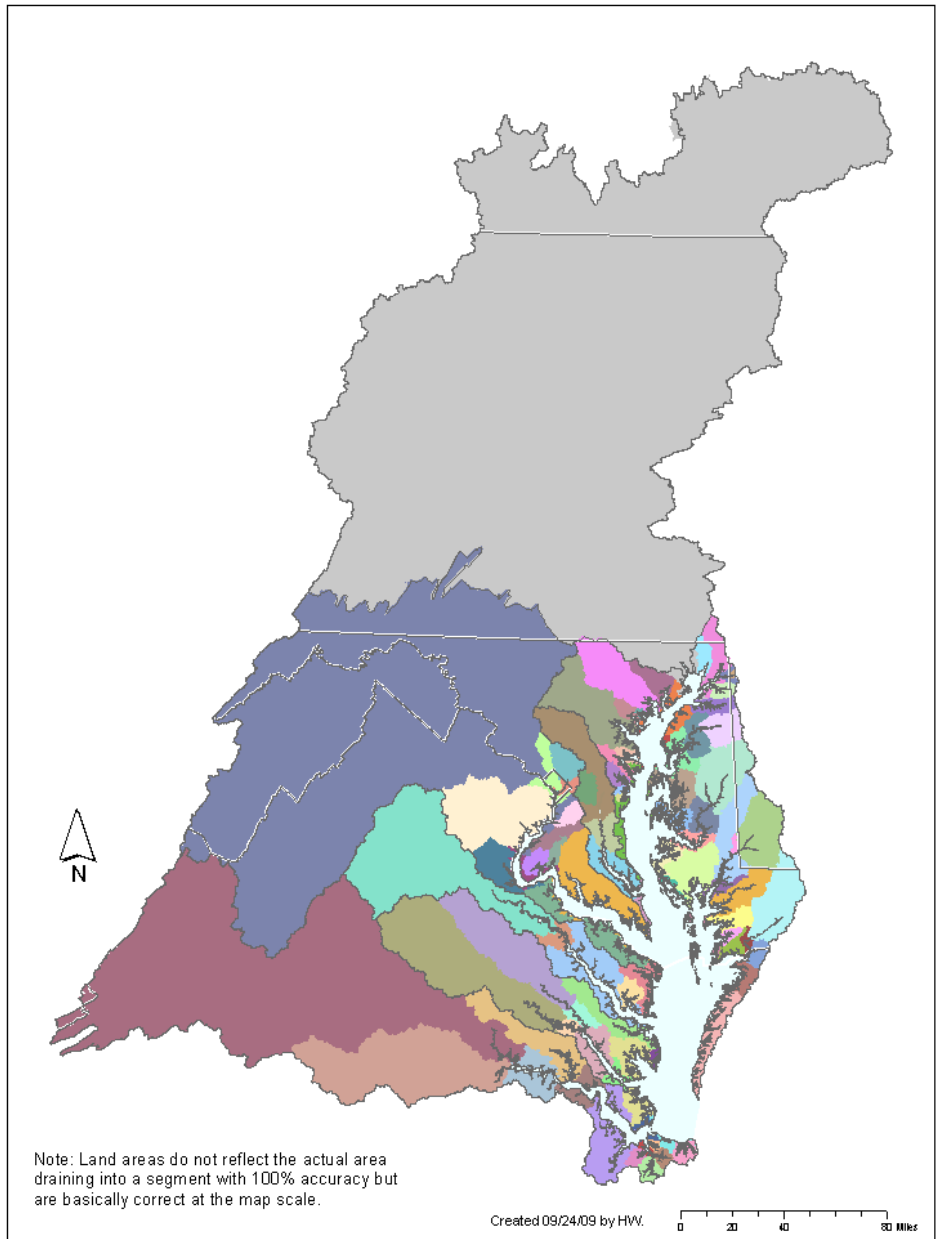
Resuspension➡clarity story?

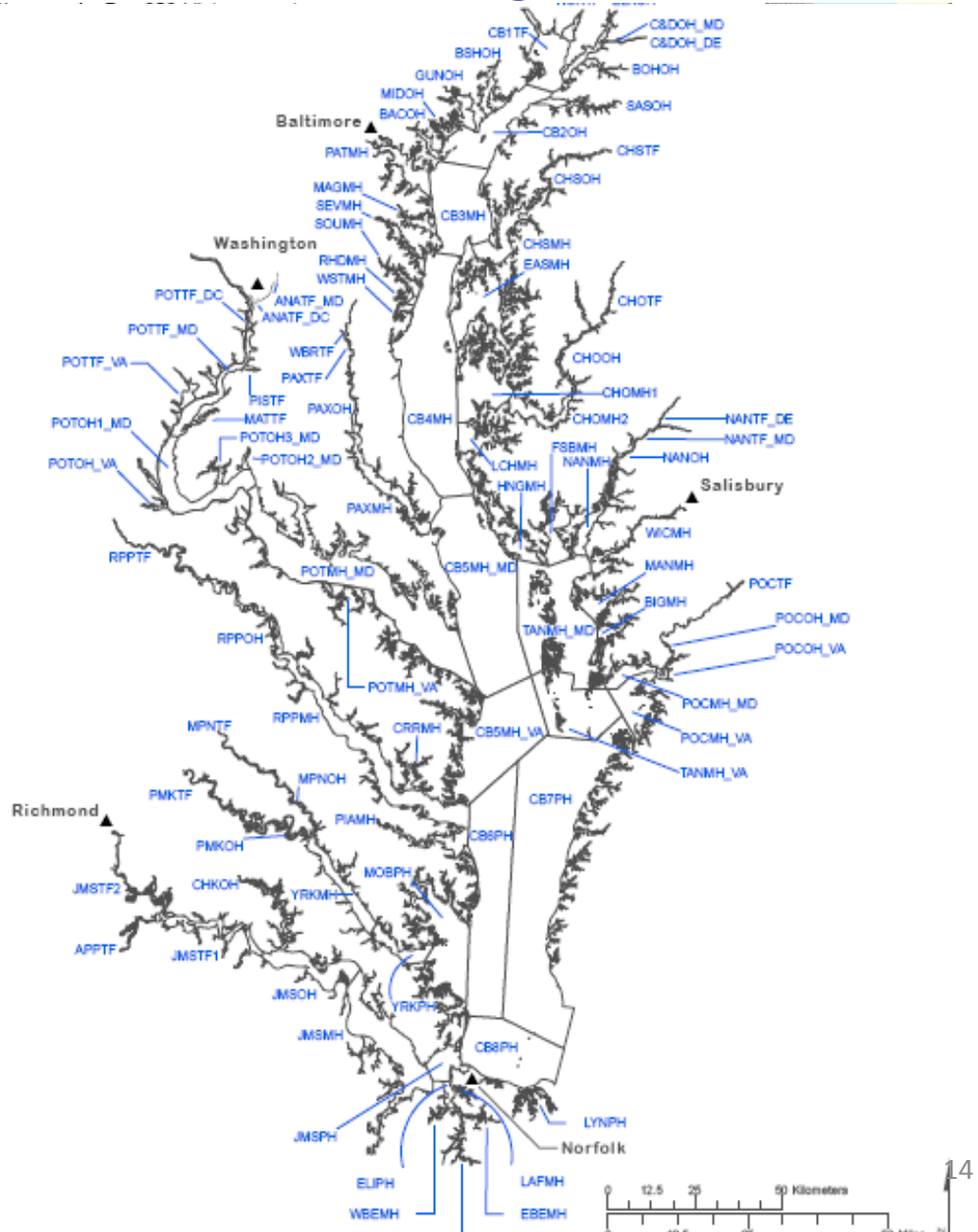
Chesapeake Bay SAV Trends: 1978-2015

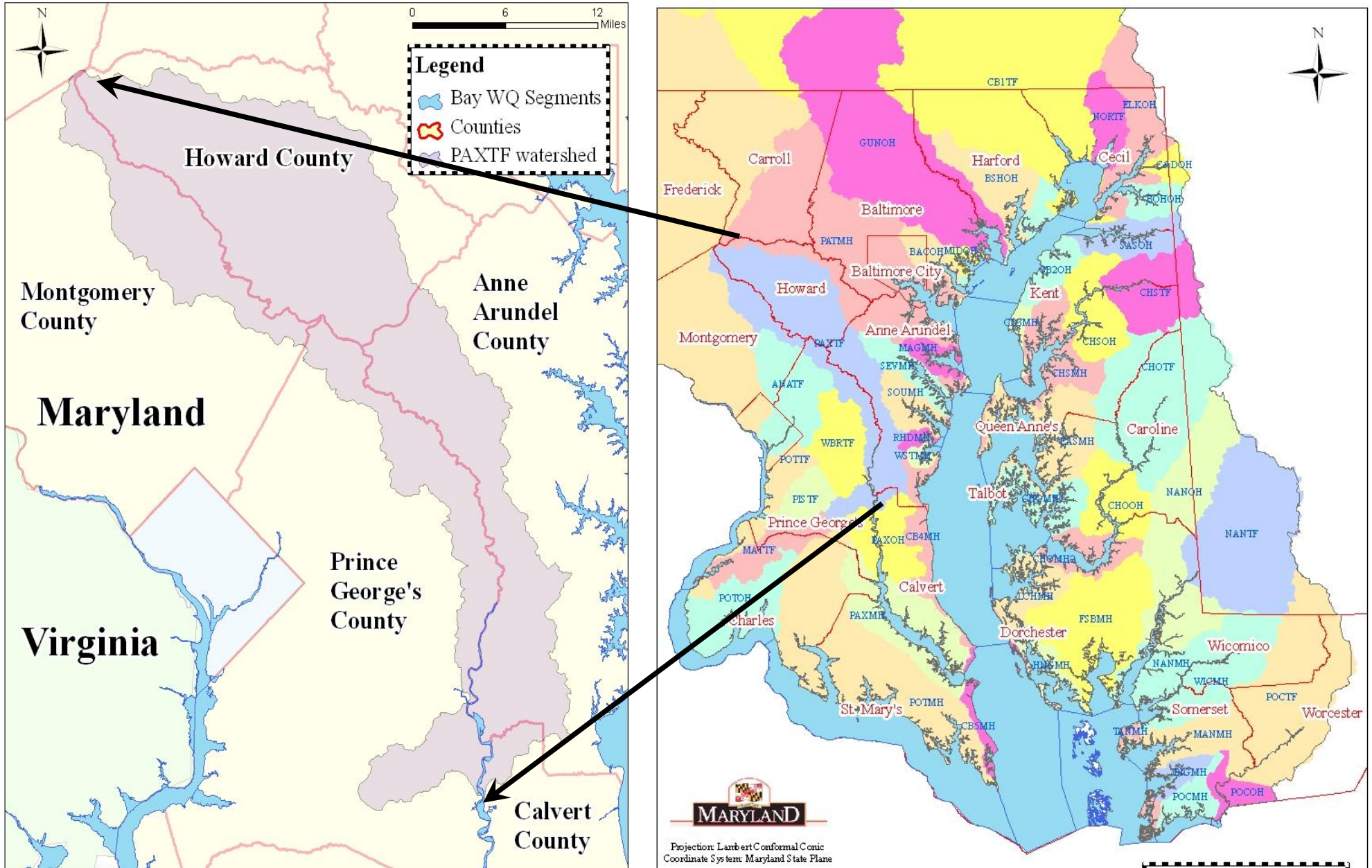


Can we forge strong, quantifiable relationships between long term SAV distribution and abundance trends and observed trends in water clarity at the local, regional and baywide scale?

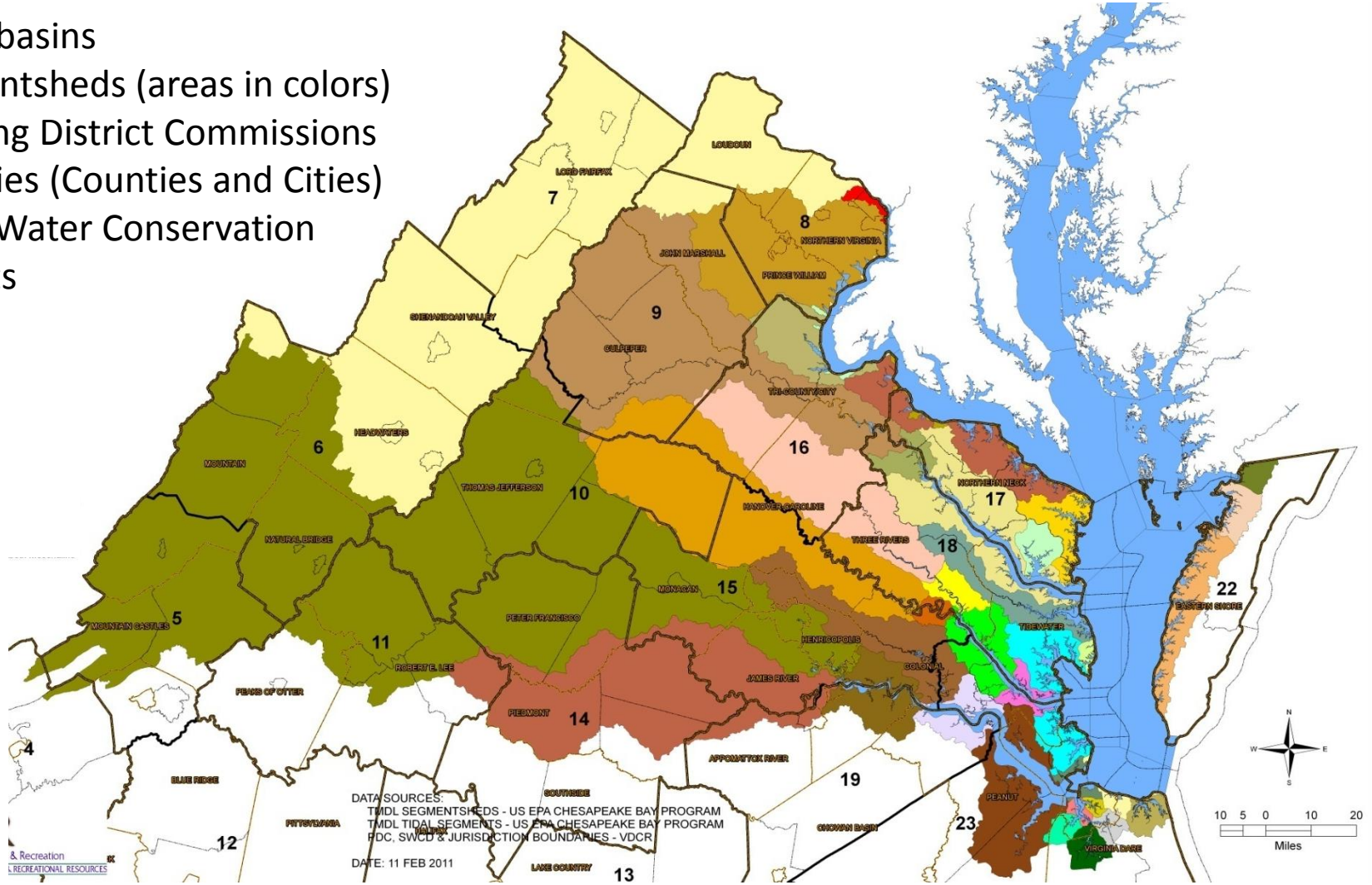
Pollution Diet for Each Tidal Water Segment






N
0
6
12
Miles
Legend
Bay WQ Segments
Counties
PAXTF watershed
Howard County
Montgomery County
Anne Arundel County
Maryland
Prince George's County
Virginia
Calvert County
N
CB1TF
ELKOH
NORTF
GUNOH
Carroll
Harford
Cecil
CADOH
Frederick
BSHOH
EQHOH
Baltimore
PATMH
BACOH
MIDOH
SASOH
Baltimore City
CB2OH
Howard
Kent
CHSTF
Montgomery
Anne Arundel
CB3MH
PAXTF
MAGMH
CHSOH
SEVMH
CHSMH
CHOTF
ANATF
SOUMH
Queen Anne's
Caroline
RHDMH
WBRTF
WSTMH
QASMH
POTTF
Talbot
NANOH
PISTF
CB4MH
CHOOH
Prince George's
PAXOH
NANTF
MATTF
HOMH
Calvert
POTOH
LCHMH
Charles
PAXMH
FSBMH
Dorchester
Wicomico
HNGMH
NANMH
WICMH
POCTF
St. Mary's
POTMH
Somerset
Worcester
CB5MH
TANMH
MANMH
SOMH
POCMH
POCOH
MARYLAND
Projection: Lambert Conformal Conic
Coordinate System: Maryland State Plane

5 Major basins
39 Segmentsheds (areas in colors)
16 Planning District Commissions
96 Localities (Counties and Cities)
32 Soil & Water Conservation Districts



Are we ready to tell Bay and watershed management that they need to re-think the relationships between sediment loads, nutrient loads and water clarity?

Should we be taking a different path towards reducing the real “sources” contributing to reduced water clarity conditions?

Rich Batiuk

Associate Director for Science, Analysis and Implementation

U.S. Environmental Protection Agency Chesapeake Bay Program Office

410-267-5731 Office

443-223-7823 Cell

batiuk.richard@epa.gov

www.chesapeakebay.net