Taunton Estuary Update

Proactive Program Triggers Request for Reassessment of TN Control Requirements

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Background on Taunton Nutrient Control Requirements

- 2015 Permitting Decision
  - 3 mg/l TN to address low DO in Taunton Estuary
  - Based on 2004-2006 SMAST data
- Agreed to Collect More Data (Validate Assumptions)
- Data Collection and Assessment by SMAST (Dr. Howes)
- D.O. Criteria/303(d) list Update by MassDEP

2015 EPA Permit
WQ Indicators

- 5.0 mg/L D.O. – Chronic Criterion (not to exceed)
- 5 µg/L chlorophyll-a (growing season average)
- 0.45 mg/L TN (growing season average)

2017 MassDEP Began to Update Marine DO Criteria

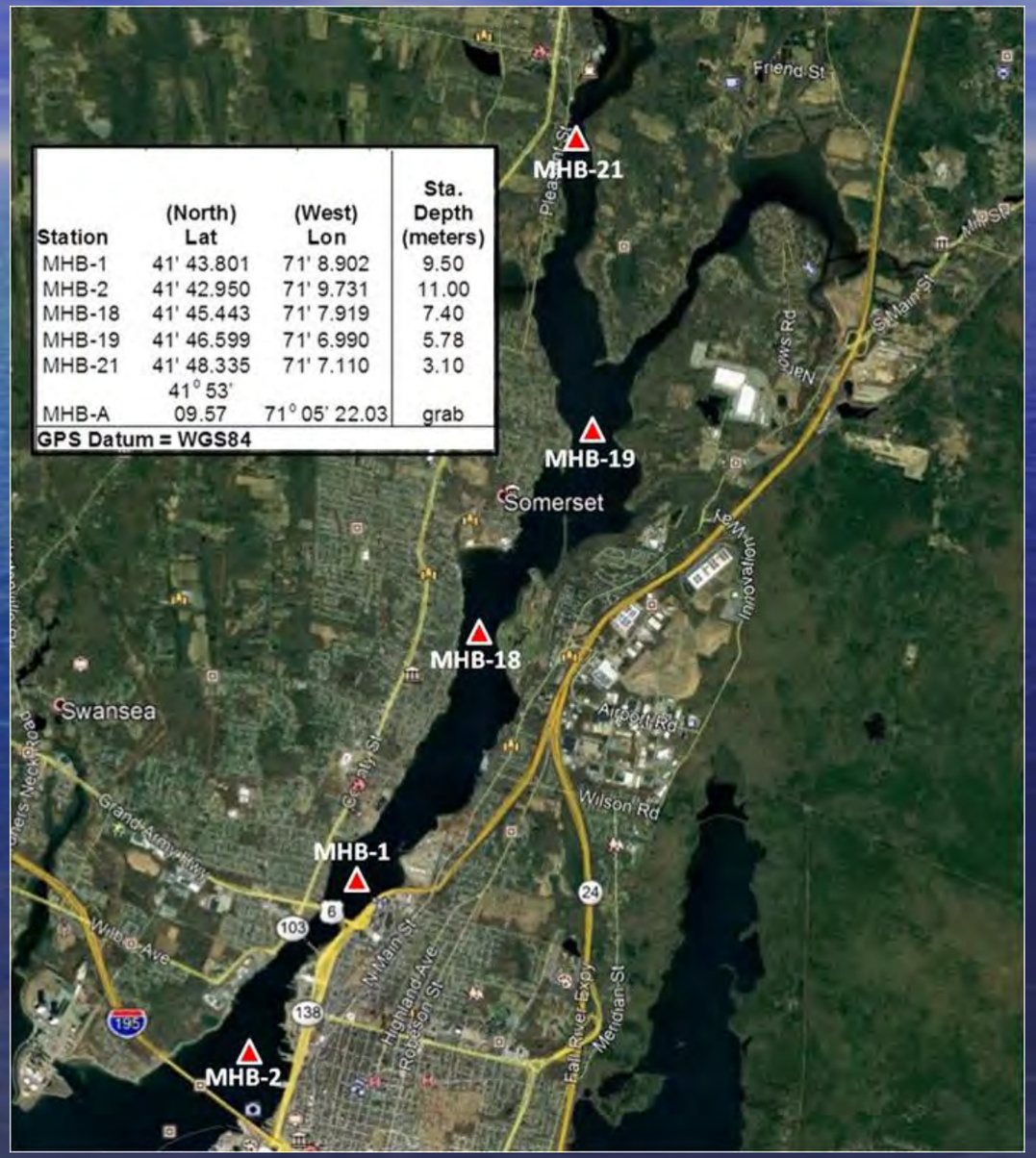
Stratification Effects Not Considered

The comment's alternative conjecture that 'low DO is produced by stratification and the condition is influenced by (1) the low DO entering from the Bay and (2) the deoxygenation of stratified waters due to sediment oxygen demand in the tidal river' is conjectural at best. There are no data presented regarding stratification in the Taunton River Estuary [...]

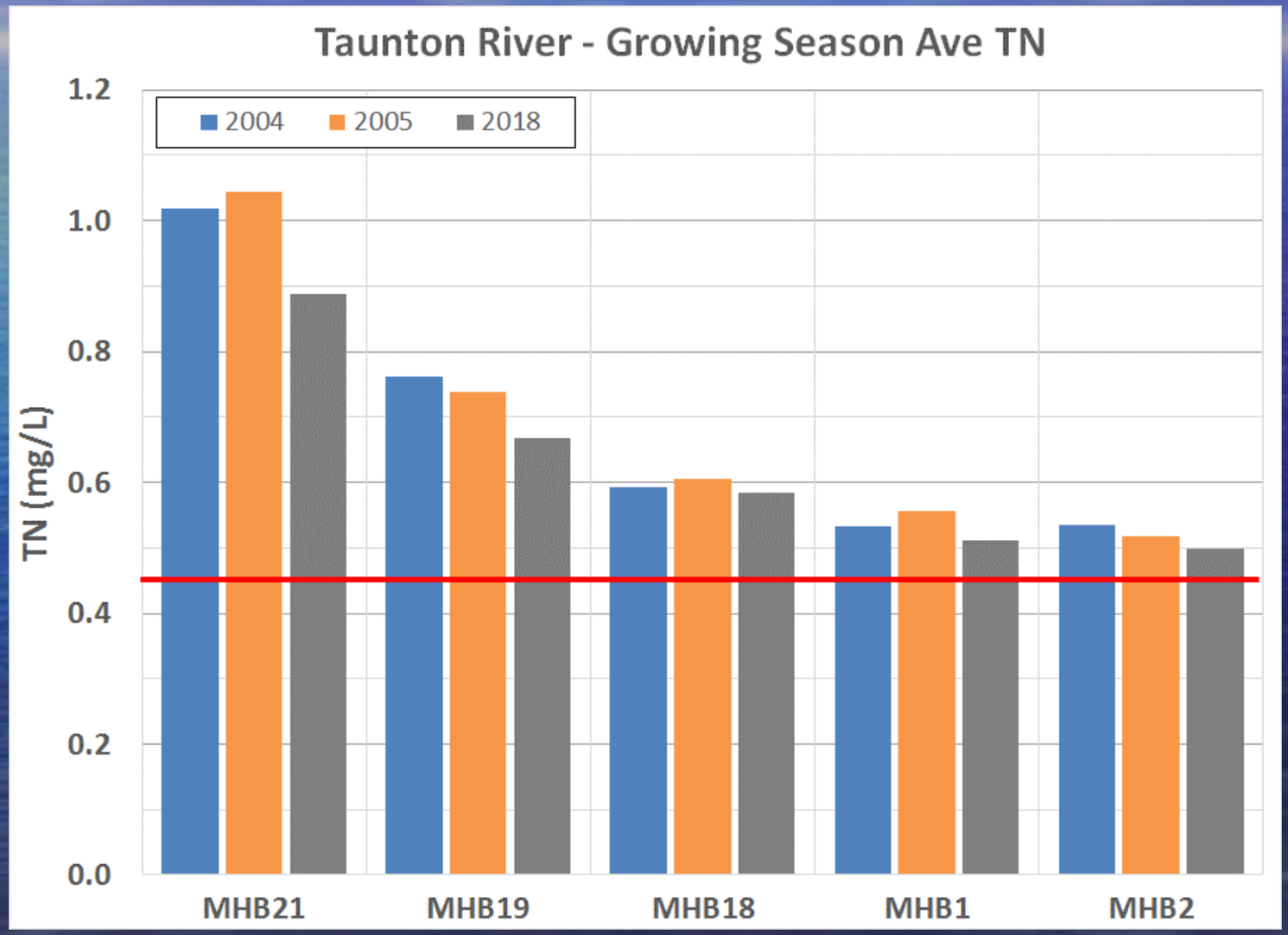
(EPA Response to Comments at 75)

2018 Howes Survey of Taunton Estuary

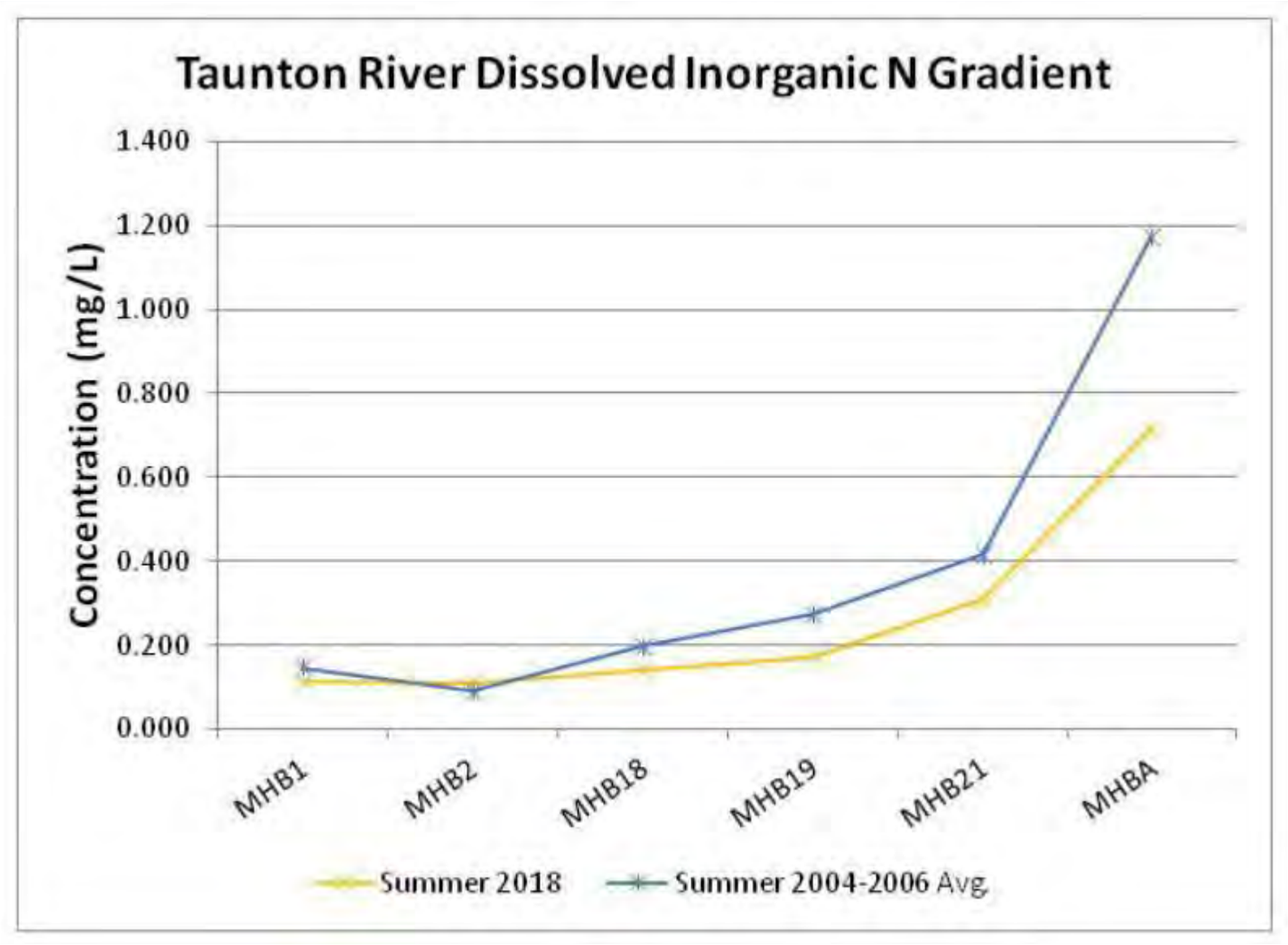
2018 Survey Sampling Stations



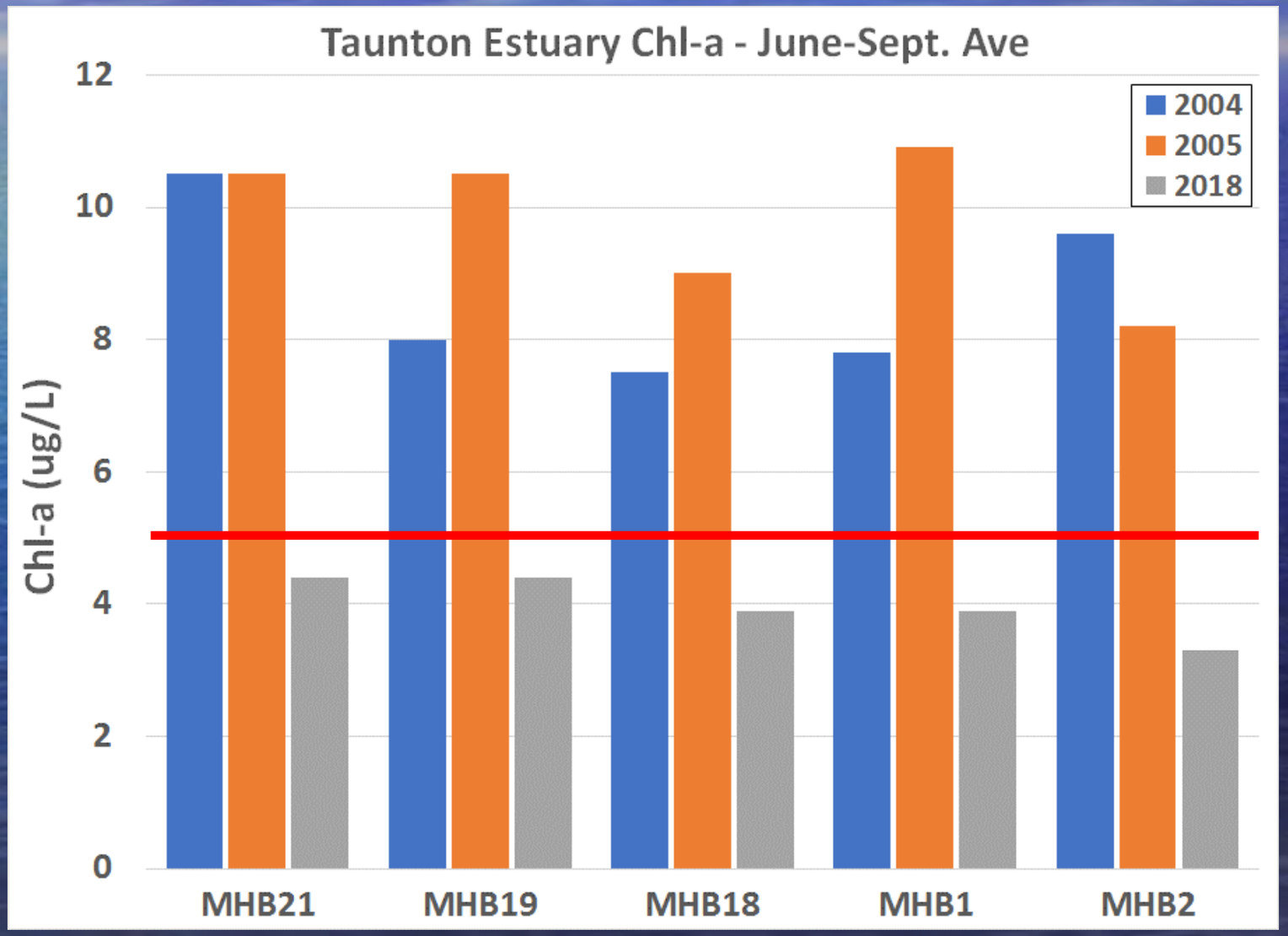
Growing Season Average TN



Improvement in DIN Concentration



Growing Season Average Chl-a

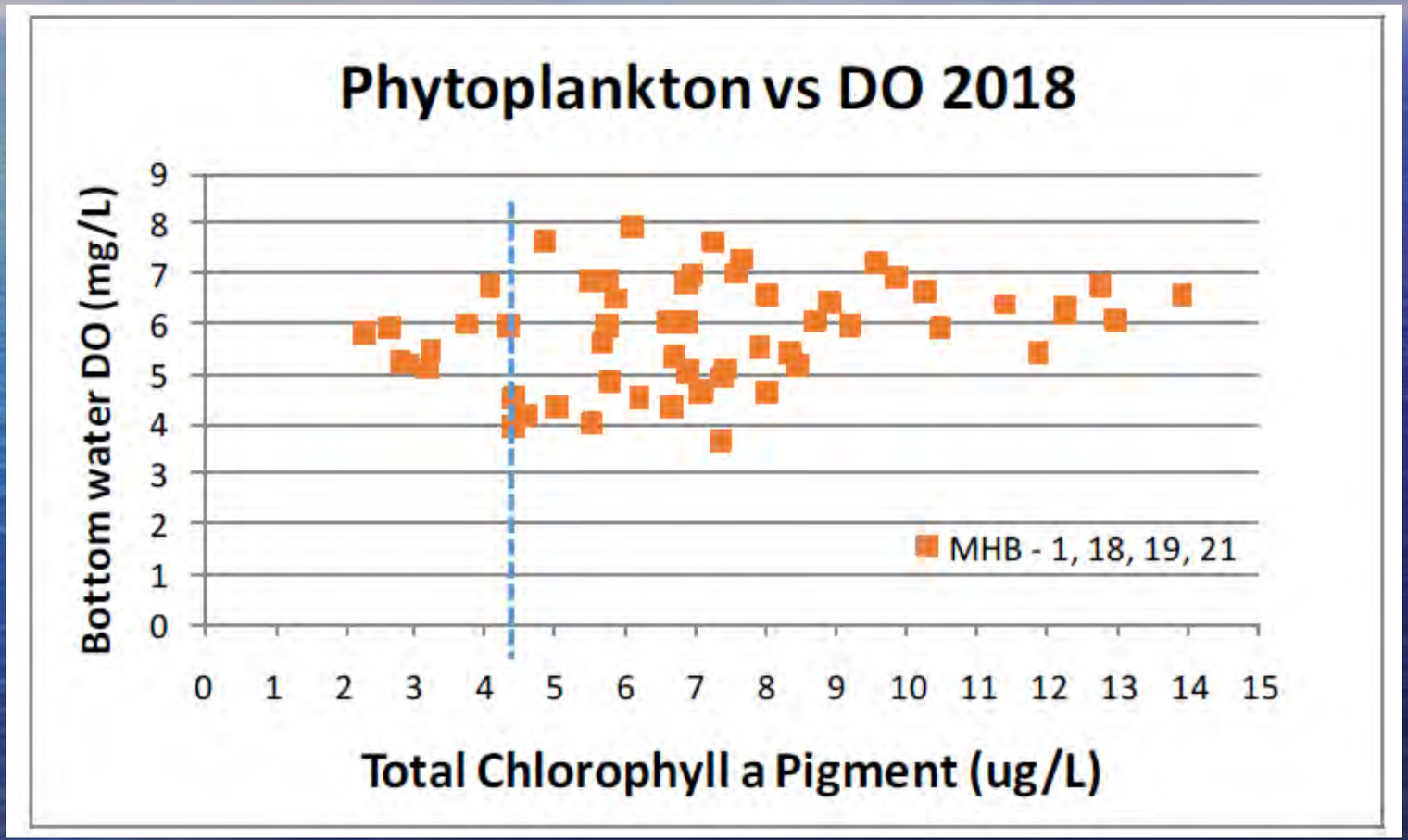


No Change in Minimum D.O.

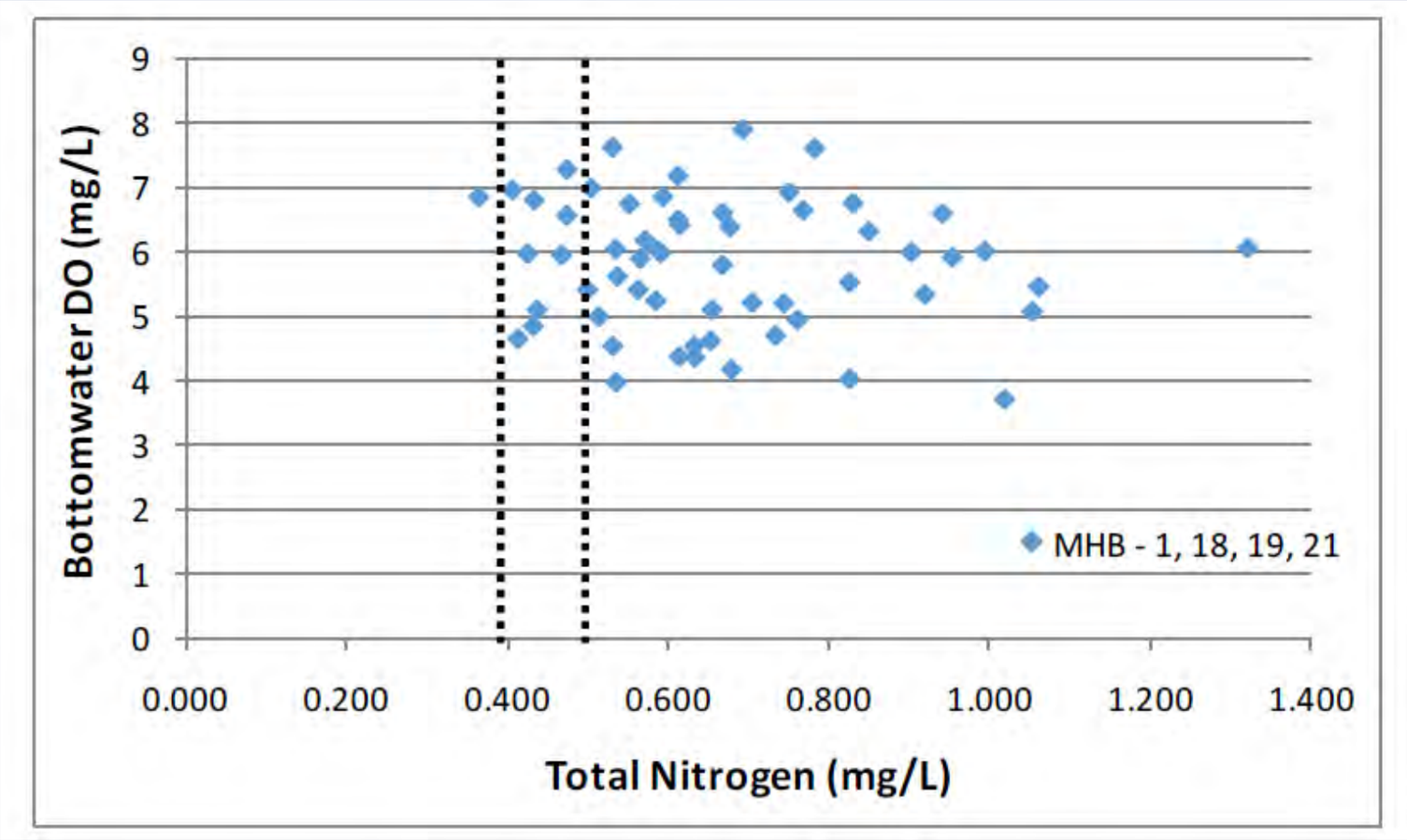
June – September Minimum D.O. (mg/L)				
Station	2004	2005	2006	2018
MHB21	3.8	4.1	4.8	3.7
MHB19	4.4	4.7	4.6	4.0
MHB18	4.7	4.4	4.3	4.2
MHB1	4.8	5.1	4.1	4.0
MHB2	4.7	5.0	3.0	4.2

Why would a Decade of Improvements have no effect on the DO regime?

No Relationship between Chlorophyll-a and Minimum D.O.



No Relationship between TN and Minimum D.O.

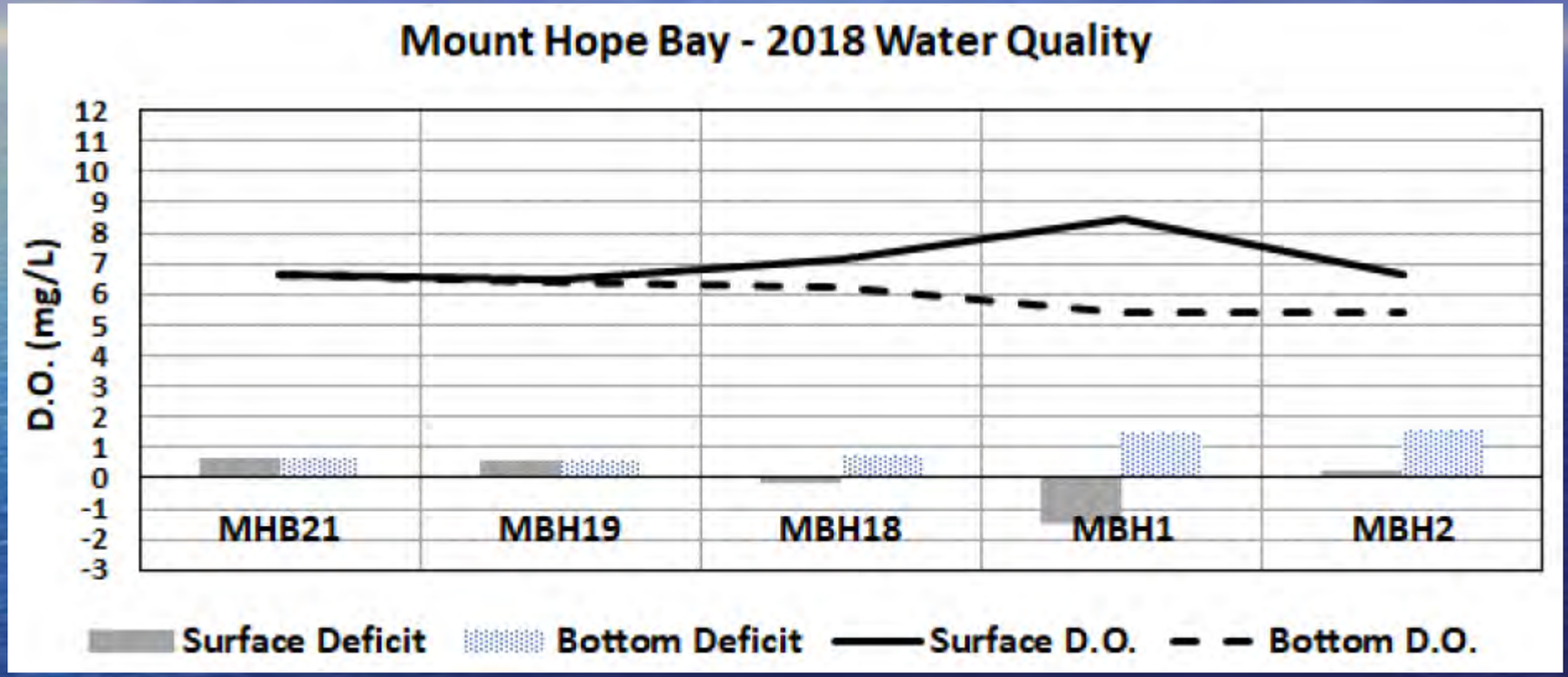


2018 D.O. Compliance Summary for Upper Taunton Estuary

Upper Taunton Estuary Stations			
Parameter	MHB21	MHB19	MHB18
Total Observations	31	42	45
D.O. < 5.0 mg/L	2	3	6
Percent Compliance	93.5%	92.9%	86.7%

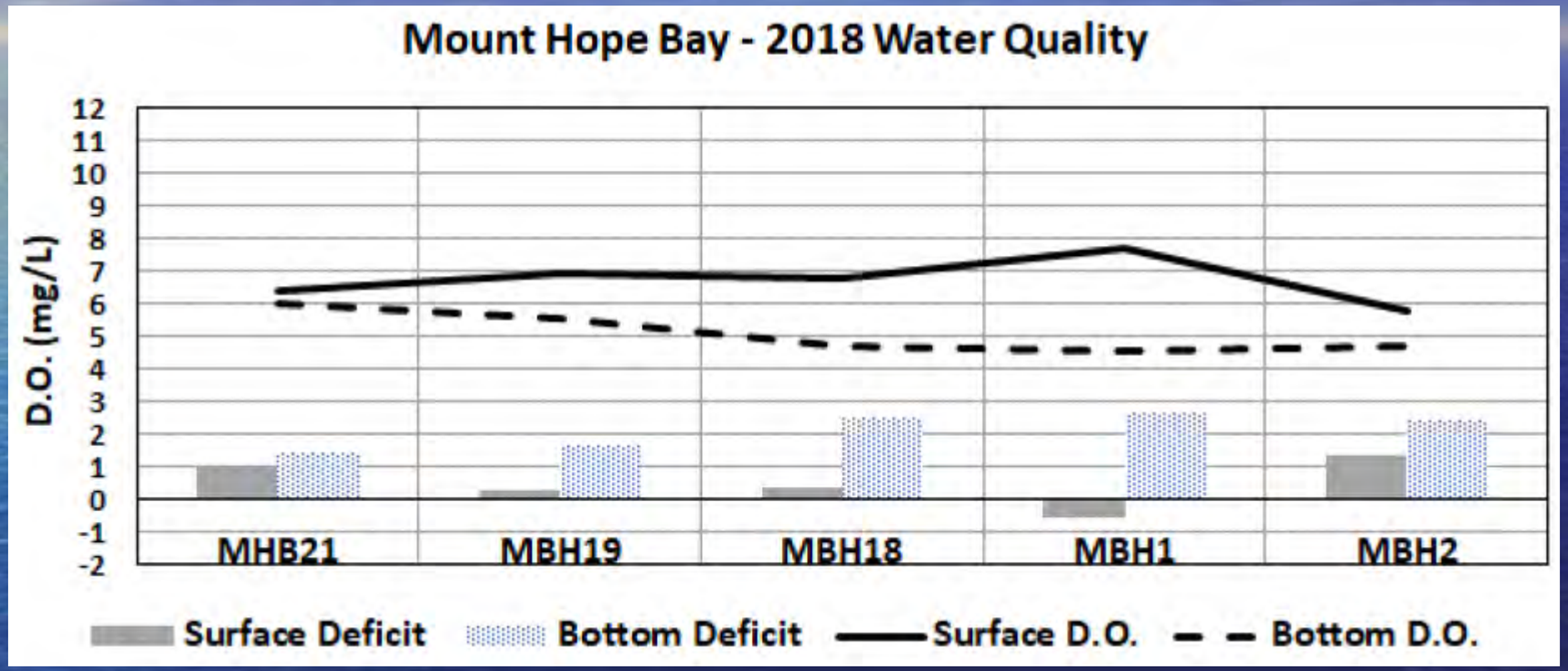
Overall: 118 observations, 11 observations < 5.0 mg/L, 90.1% Compliance
Mass DEP DO Criteria Update should eliminate all non-compliance

Stratification Controls Minimum D.O.



D.O. profile in Taunton Estuary when Mount Hope Bay D.O. > 5.0 mg/L.
Waters closest to Mount Hope Bay (MHB1, MHB2) stratified. D.O. improves upstream, less stratification.

Stratification Controls Minimum D.O.



D.O. Profile in Taunton Estuary when Mount Hope Bay D.O. < 5.0 mg/L.
Profile suggest background conditions in Mount Hope Bay drive downstream D.O.

SMAST Data Report Observations

- System WQ significantly improved since 2004-2006 for the following key water quality metrics:
  - Total Nitrogen, DIN and Particulate N
  - Chlorophyll-a; Pheophytin-a
- Oxygen Minima were not statistically different
- Stratification is controlling low DO occurrence
- Low DO Originates from Mount Hope Bay – focus efforts on that location

Regulatory Assessment of New Data

Chlorophyll-a: growing season average meets the threshold level (5 µg/L) identified by EPA (System not eutrophic)

No algal-induced D.O. impairment in Upper Taunton Estuary; 90% attainment meets 303(d) guidance

TN growing season average target (0.45 mg/L) does not relate to DO or narrative WQS attainment in Taunton System

Focus on Mount Hope Bay requires a different assessment methodology

Regulatory Status

- Taunton filed permit modification requests based on updated scientific studies – stringent TN control not necessary
- Updated D.O. criteria also confirm DO regime in Taunton Estuary protects aquatic life
- Suggested limit: 8 mg/L TN, growing season average with 1.8 MGD flow increase
- Seeking extend compliance schedule for construction
- WER approval on copper also pending

For Further Information

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