TEN YEARS of Monitoring
Spa Creek and Back Creek 2025 Summary Report
Looking Back and Moving Forward

2016:

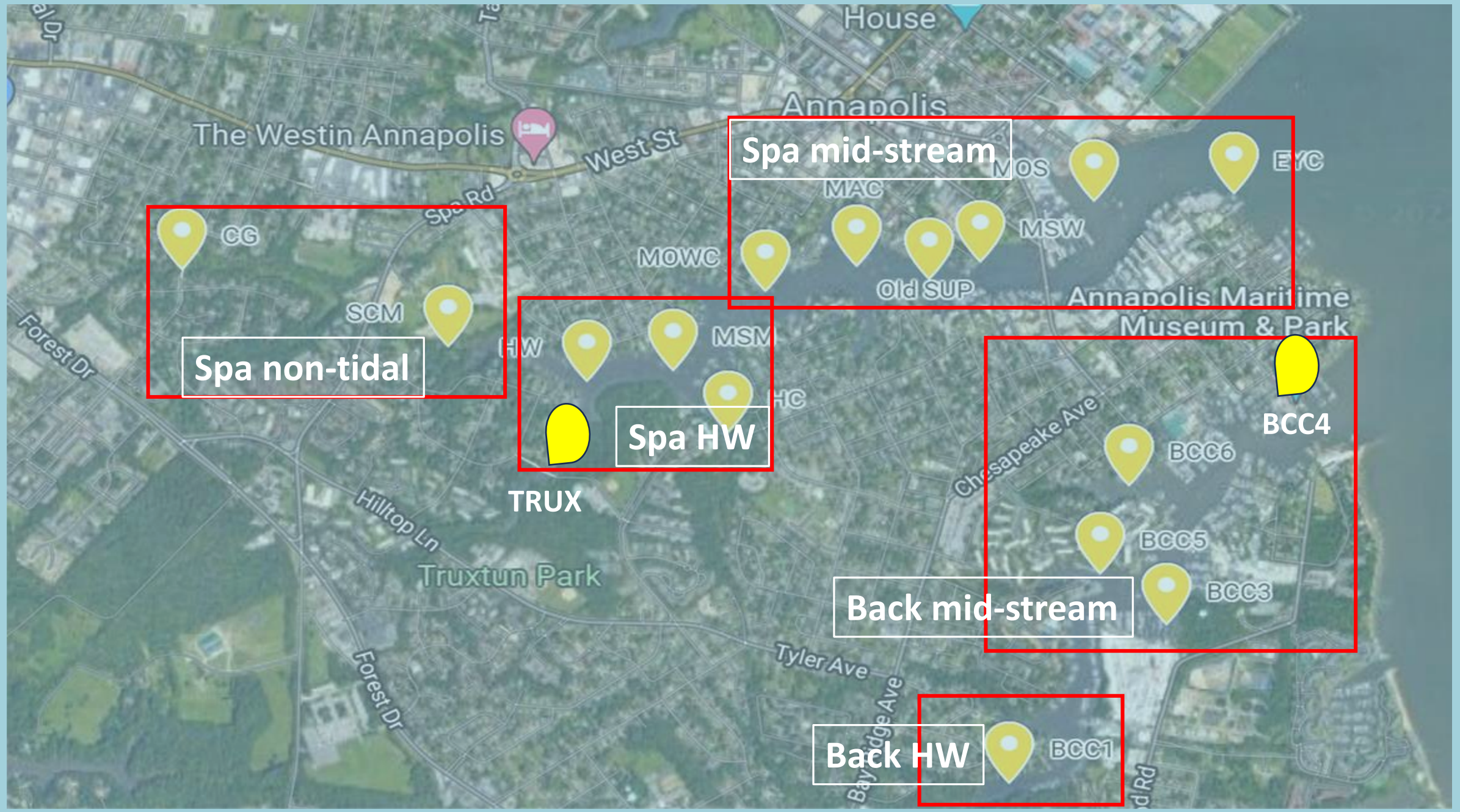
- Only Spa Creek only 5 sites; all shore-based

2025:

- 2 creeks
- 15 (17) sites
- 1000s of data points
- 9 years of data

AACC Environmental Center

Spa Creek CONSERVANCY


House
Annapolis
The Westin Annapolis
West St
Spa Rd
Forest Dr
Hilltop Ln
Truxtun Park
Tyler Ave
Bay Ridge Ave
Chesapeake Ave
Annapolis Maritime Museum & Park
CG
SCM
MOWC
MAC
MOS
MSW
EYC
Old SUP
HW
MSM
HC
TRUX
BCC4
BCC6
BCC5
BCC3
BCC1
Spa non-tidal
Spa HW
Spa mid-stream
Back mid-stream
Back HW

HOW TO ASSESS WATER QUALITY?

- Use guidelines established by MTAC in
- 2011 to score some parameters.
- Chesapeake Monitoring Cooperative Tier III certification for monitoring procedure
- EPA 1600 Media Selection Method for *Enterococci*
- For Others use Chesapeake Bay Program standards developed by EPA

Table 4.4. A grade and description are assigned based on the score that the indicator or sub-region achieves.

Score (%)	Grade	Description
≥0 to <20	F	Very poor
≥20 to <25	D–	Poor
≥25 to <35	D	Poor
≥35 to <40	D+	Poor
≥40 to <45	C–	Moderately Poor
≥45 to <55	C	Moderate
≥55 to <60	C+	Moderate
≥60 to <65	B–	Moderately Good
≥65 to <75	B	Moderately Good
≥75 to <80	B+	Moderately Good
≥80 to <85	A–	Good
≥85 to <95	A	Good
≥95 to <100	A+	Good
=100	A+	Very Good

All water quality and biological health indicators meet desired levels. Water quality in these locations tends to be very good, most often leading to very good habitat conditions for fish and shellfish.

Most water quality and biological health indicators meet desired levels. Water quality in these locations tends to be good, often leading to good habitat conditions for fish and shellfish.

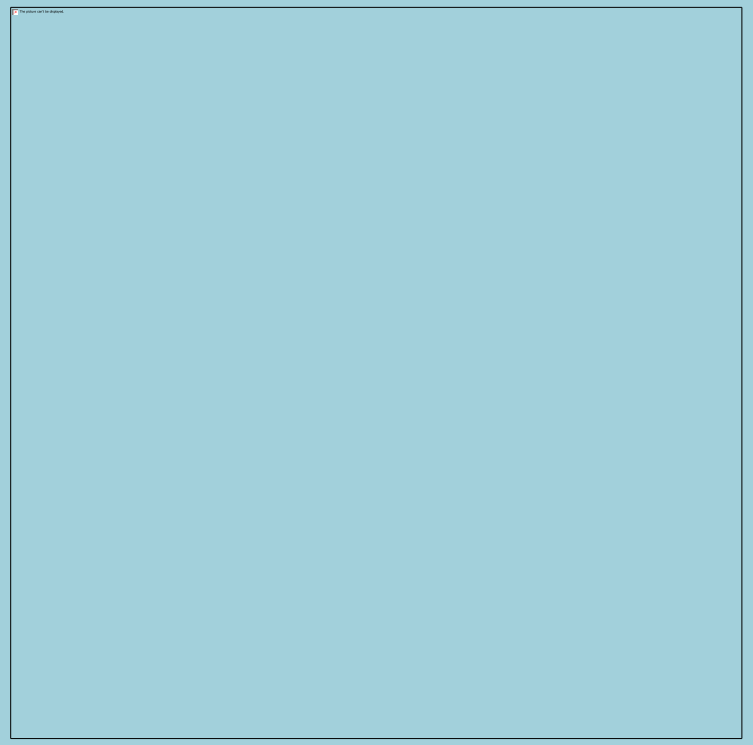
There is a mix of good and poor levels of water quality and biological health indicators. Water quality in these locations tends to be fair, often leading to fair habitat conditions for fish and shellfish.

Some or few water quality and biological health indicators meet desired levels. Water quality in these locations tends to be poor, often leading to poor habitat conditions for fish and shellfish.

Very few or no water quality and biological health indicators meet desired levels. Water quality in these locations tends to be very poor, most often leading to very poor habitat conditions for fish and shellfish.

Figure 4.5. Descriptions of ecological health that correspond with each grade.

RAIN



2025

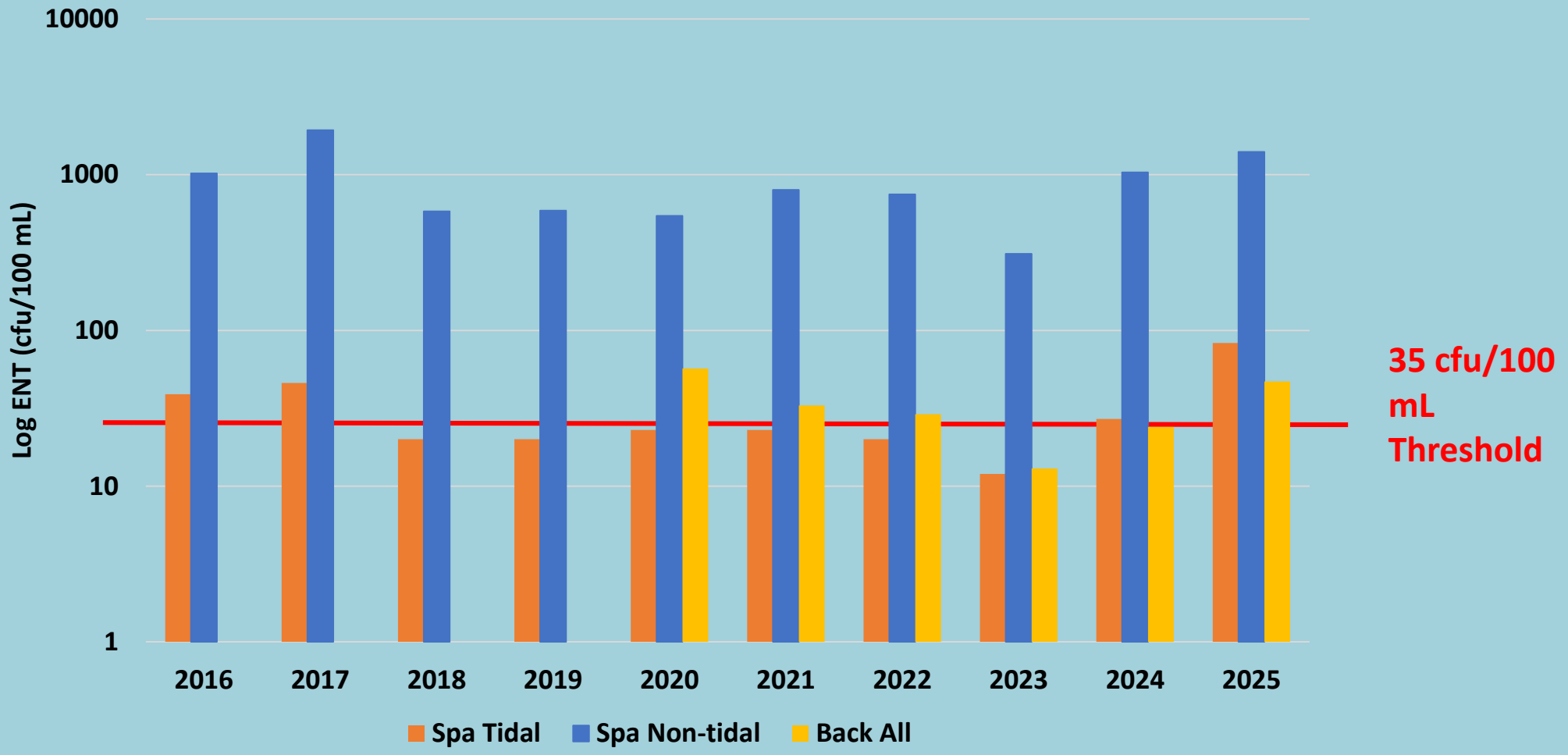
3 sampling days affected by 0.5- <1 inch of rain

1 sampling day affected by 1-<2 inches of rain

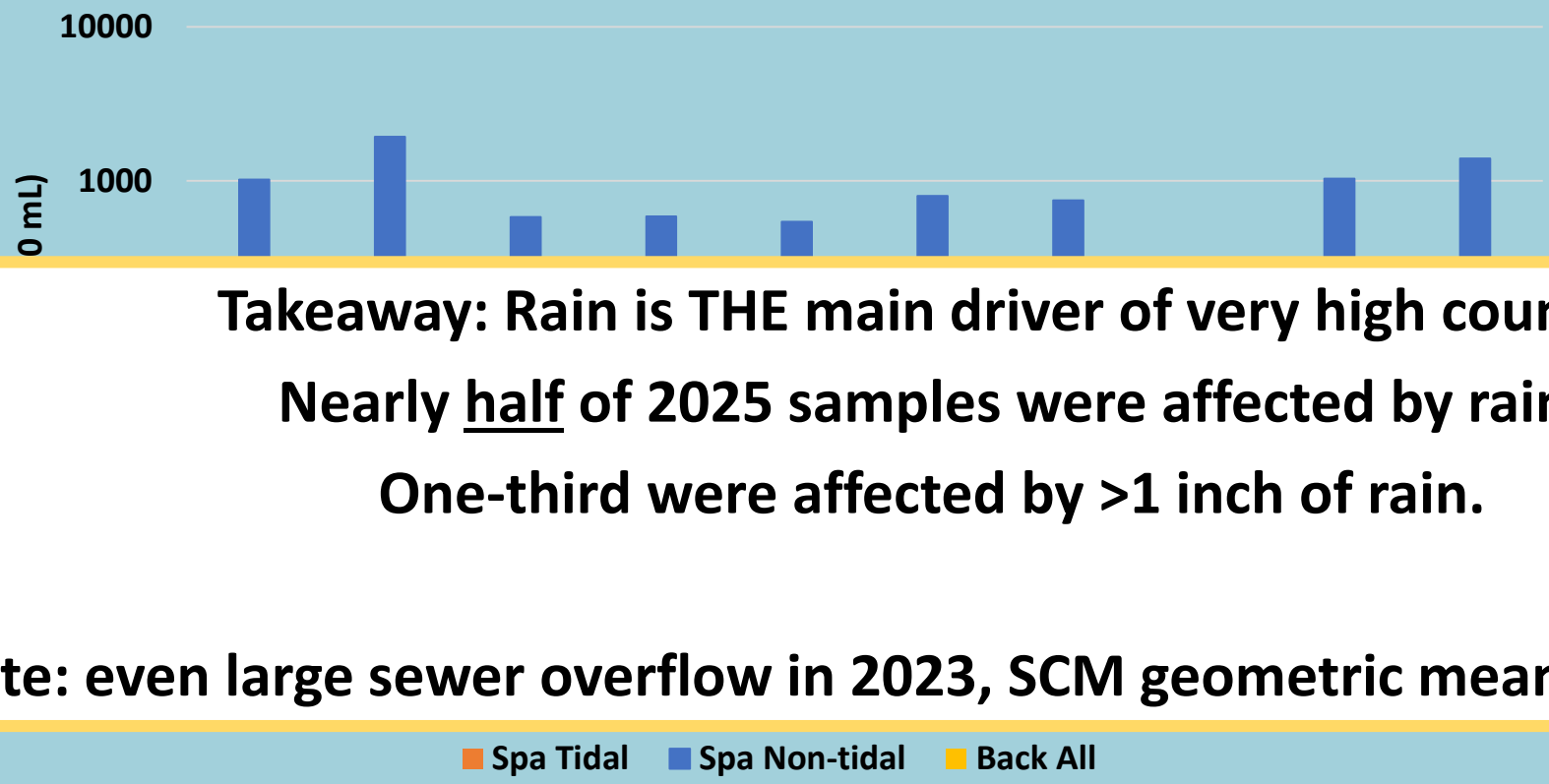
4 sampling days affected by 2 inches or more

This is unprecedented in 10 years of monitoring

Enterococcus Geometric Means



Enterococcus Geometric Means



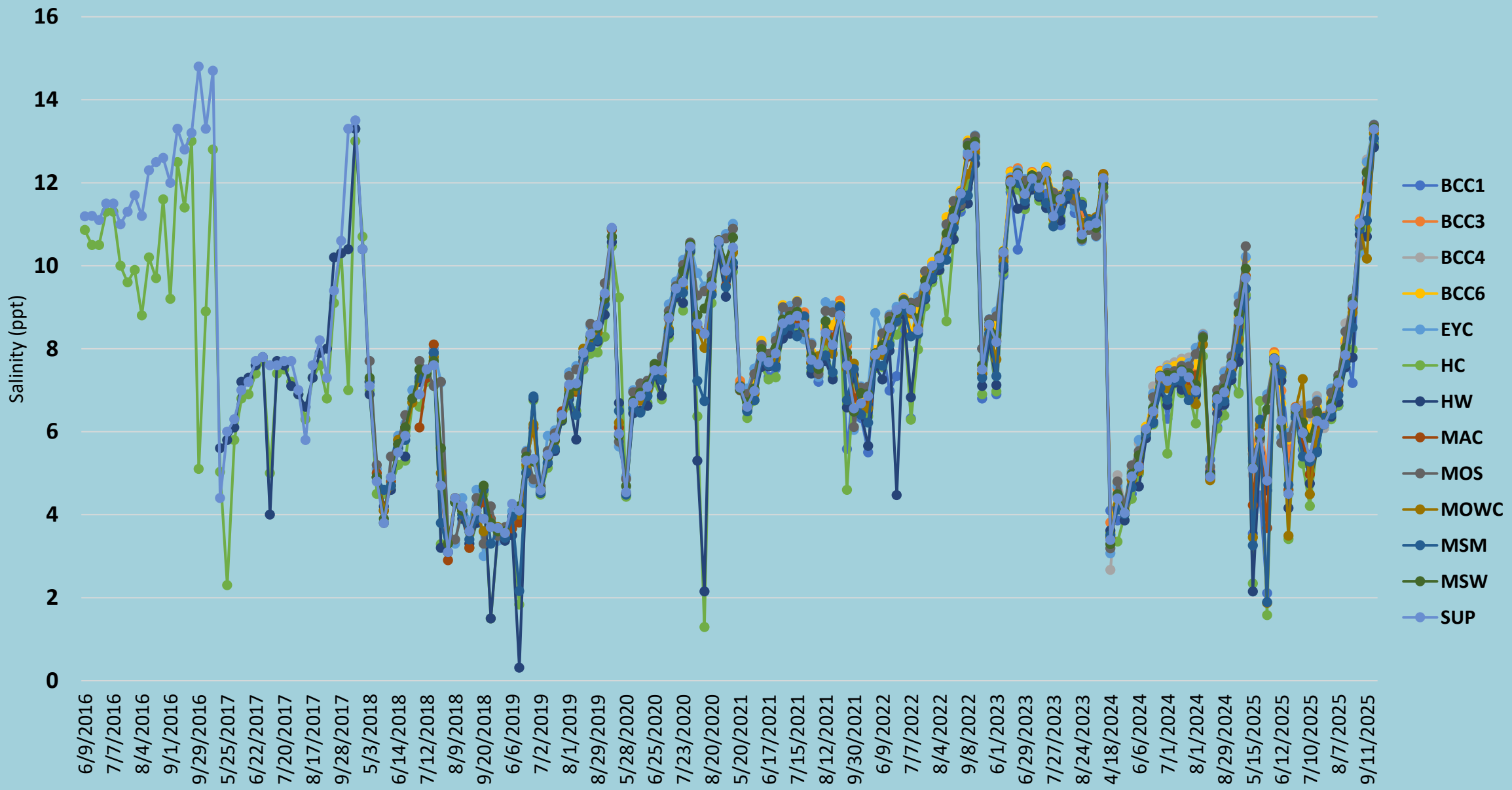
Takeaway: Rain is THE main driver of very high counts.

Nearly half of 2025 samples were affected by rain.

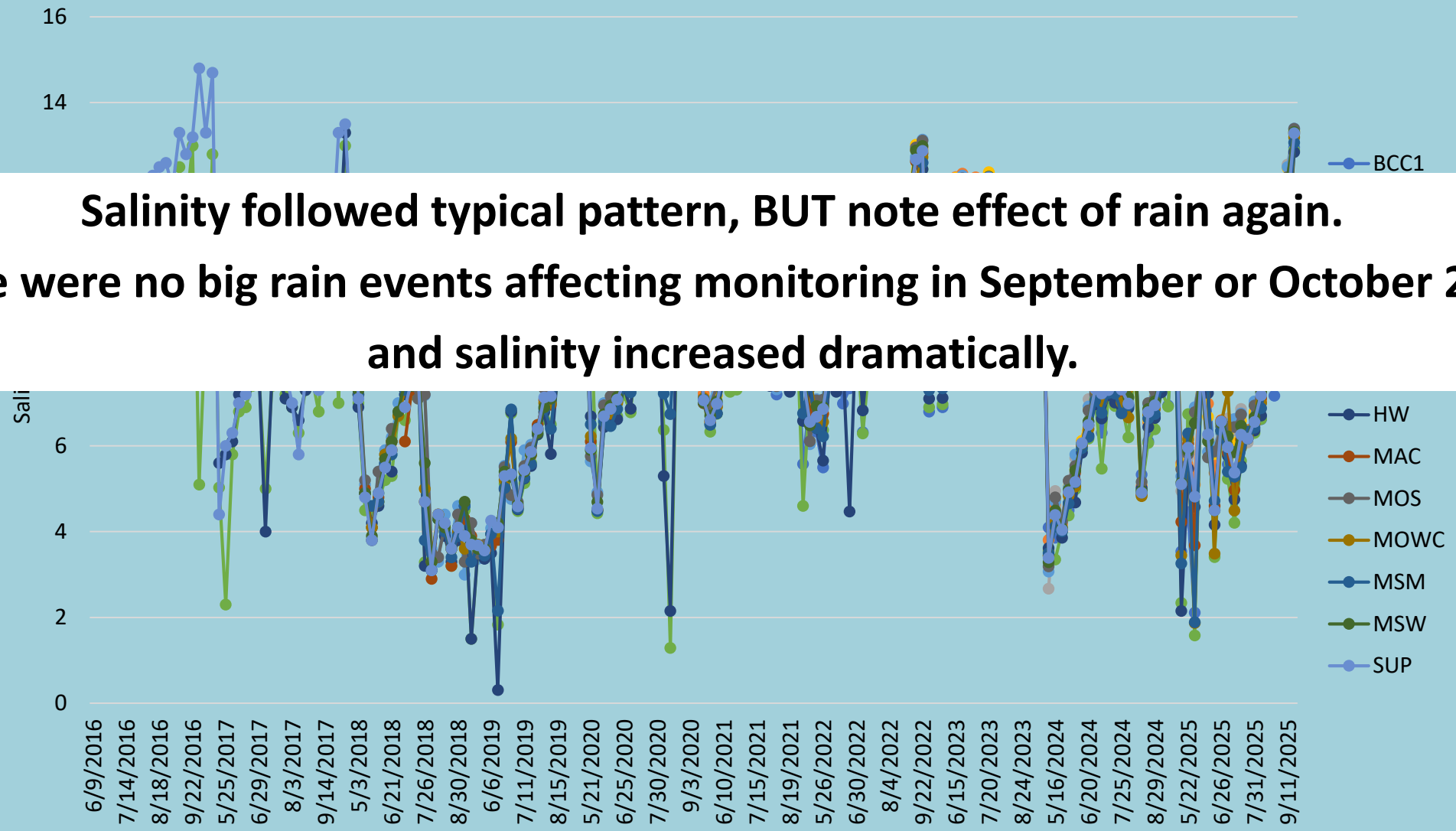
One-third were affected by >1 inch of rain.

(Note: even large sewer overflow in 2023, SCM geometric mean was only 272)

Surface Salinity



Surface Salinity



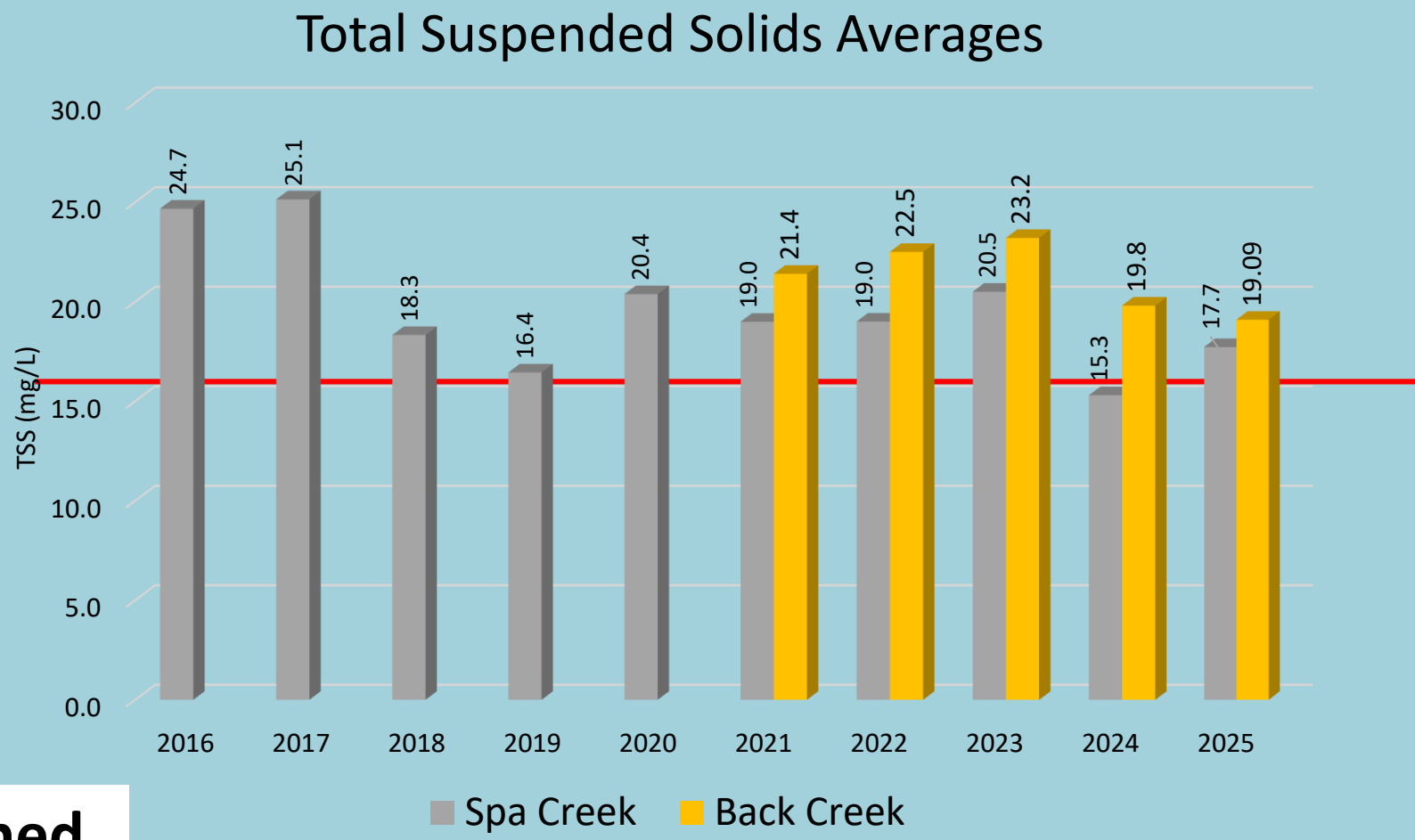
Salinity followed typical pattern, BUT note effect of rain again.

There were no big rain events affecting monitoring in September or October 2025 and salinity increased dramatically.

Annual Average Temperatures

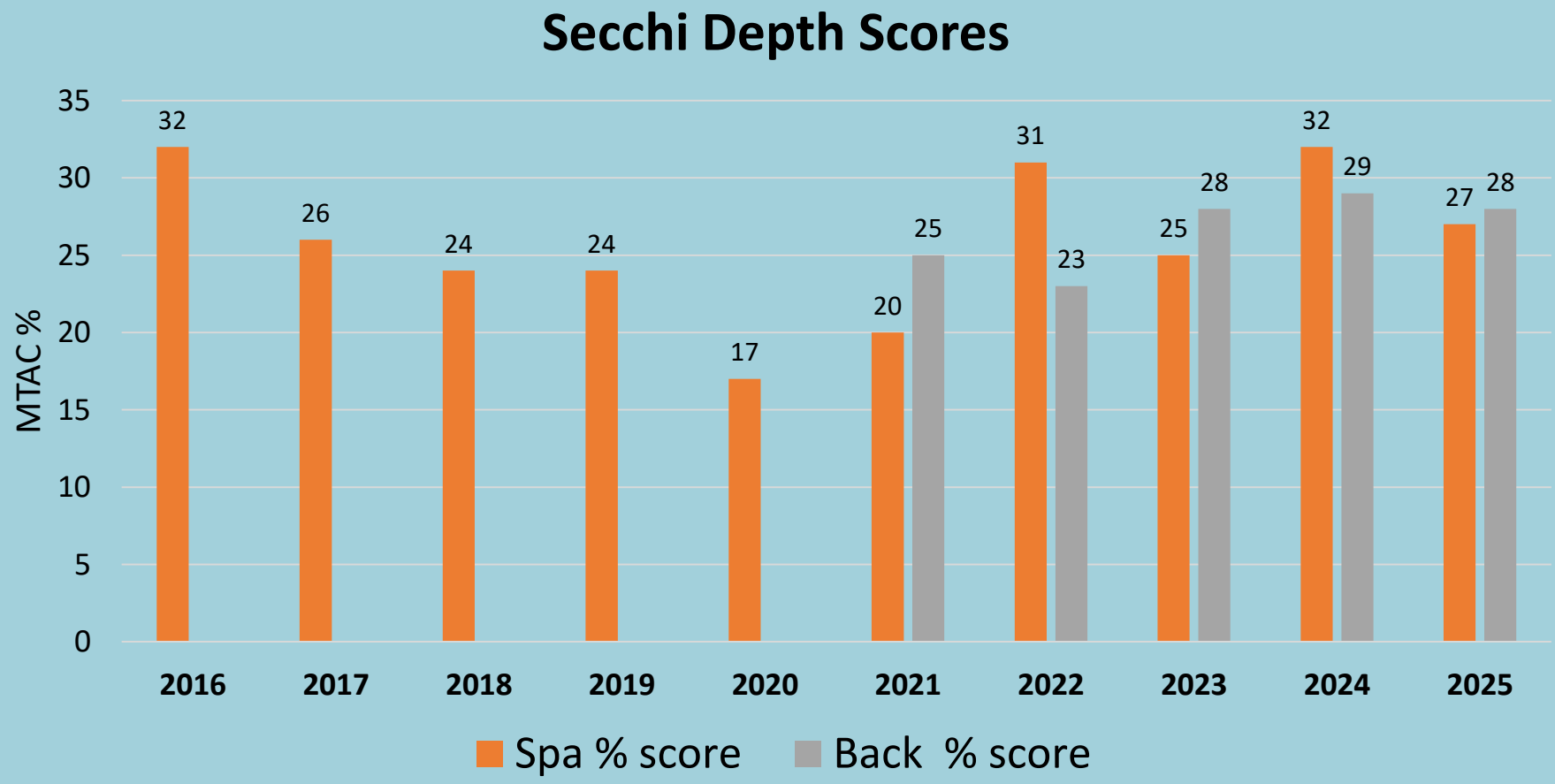
Takeaway: The apparent decrease in water temperature is likely due to the rain that affected nearly half of the monitoring events.

Water clarity is a measure of how much light penetrates through the water column. It is dependent upon the amount of ***suspended particles*** (e.g., sediment and plankton) and colored organic matter present.



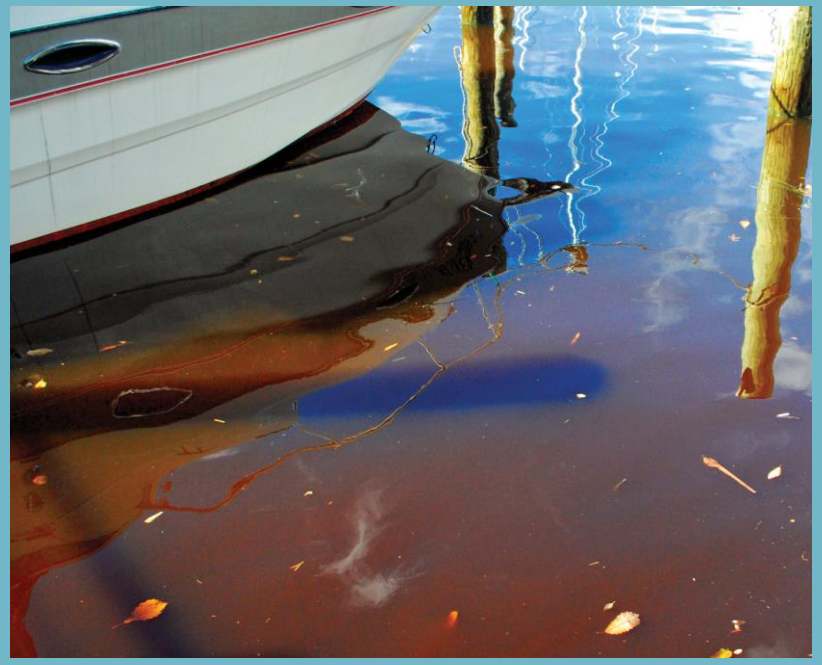
Takeaway: Overall TSS worsened.

Water clarity is a measure of how much light penetrates through the water column. It is dependent upon the amount of suspended particles (e.g., sediment and plankton) and colored organic matter present.

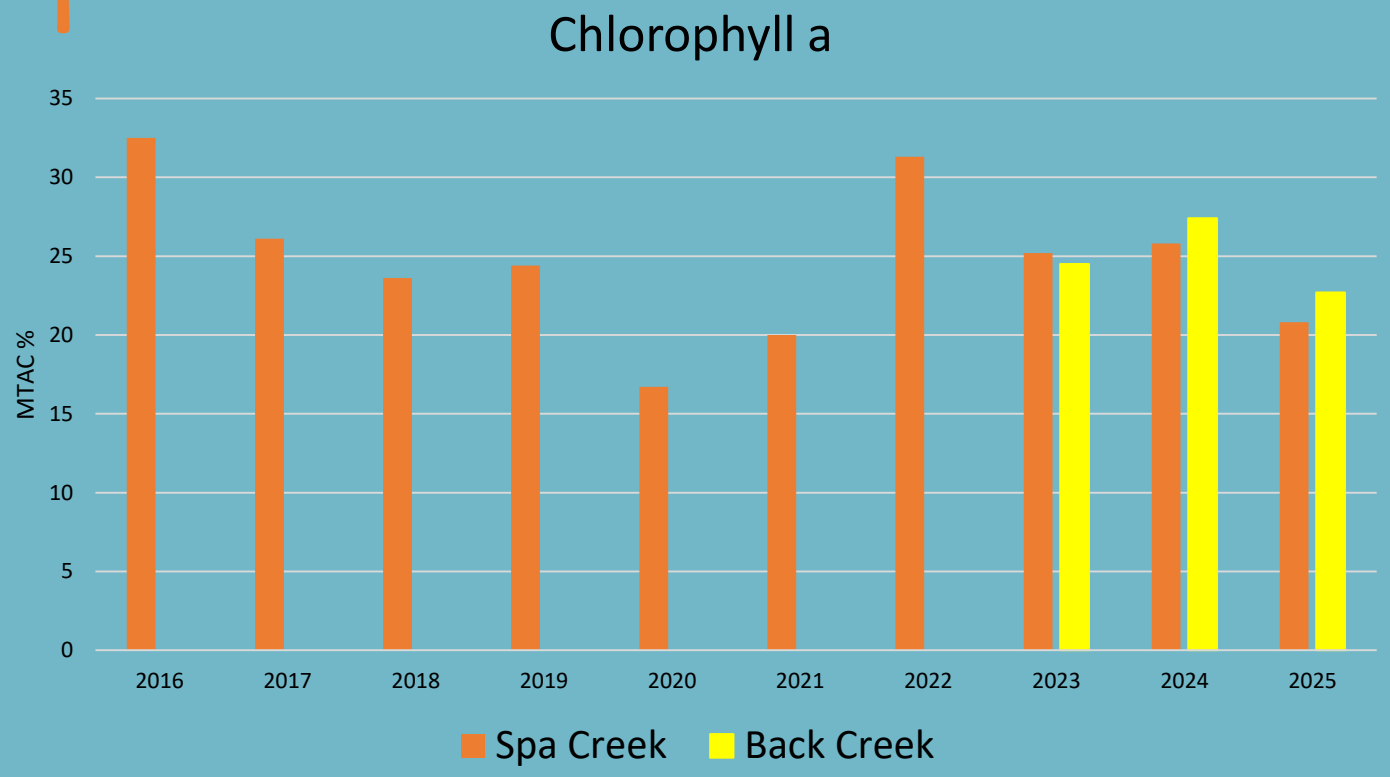


Takeaway: Overall Secchi Grade is still a D

Chlorophyll and Algal Blooms: a problem that is not going away

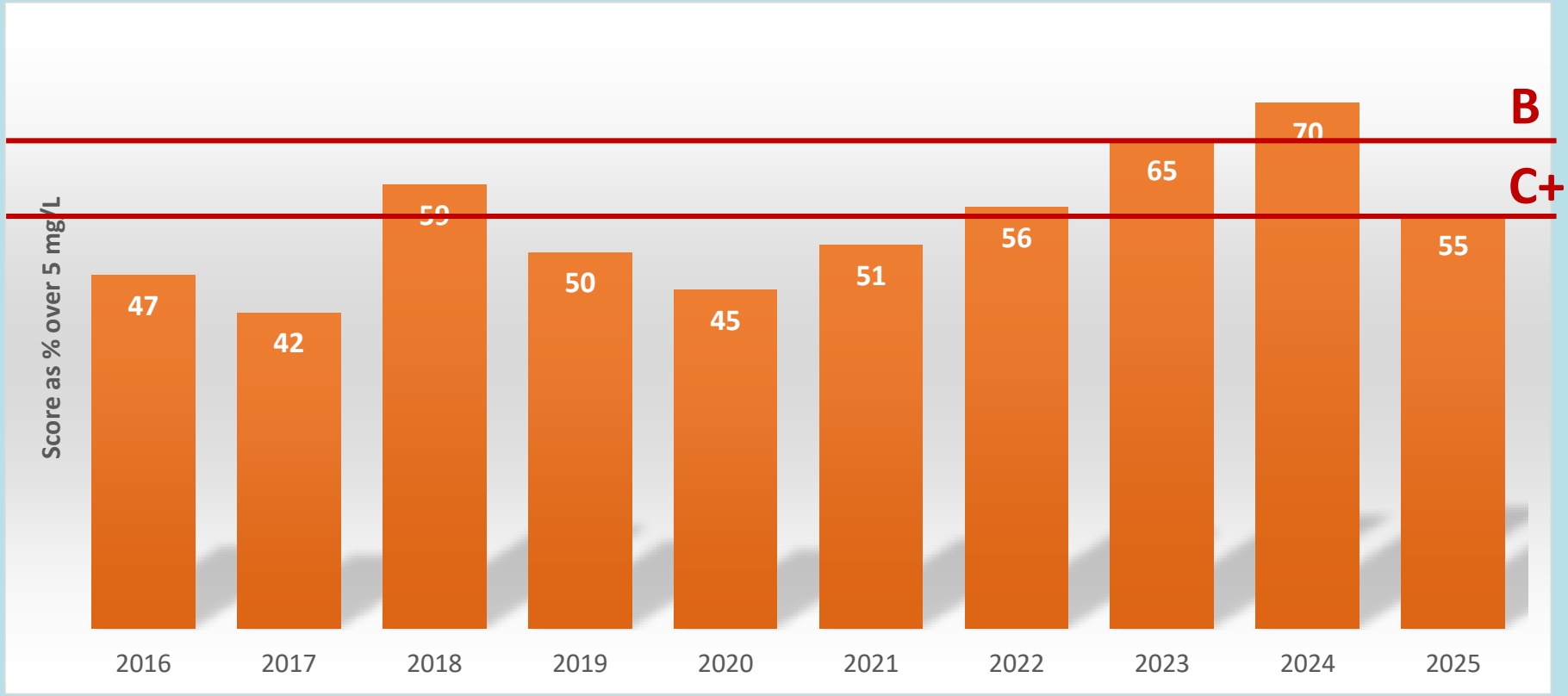


***A bloom** of* Prorocentrum minimum*, commonly called a mahogany tide, appeared in Spa Creek in Annapolis, Md., on October 28, 2009. Photo , Alicia Pimental / Chesapeake Bay Program*



Takeaway: Clarity is also affected by algal blooms. There were no long-term blooms in 2025, but persistent nutrient issues keep chlorophyl levels persistently elevated. Grade is D-.

Dissolved Oxygen Averages & Scores- Spa and Back Creeks



★ Spa and Back Creek values combined 2023 forward

Takeaway: Dissolved Oxygen on both creeks decreased significantly in 2025. Similar pattern in other rivers.

Dissolved Oxygen Averages & Scores- Spa and Back Creeks

5 mg/L is the KEY:

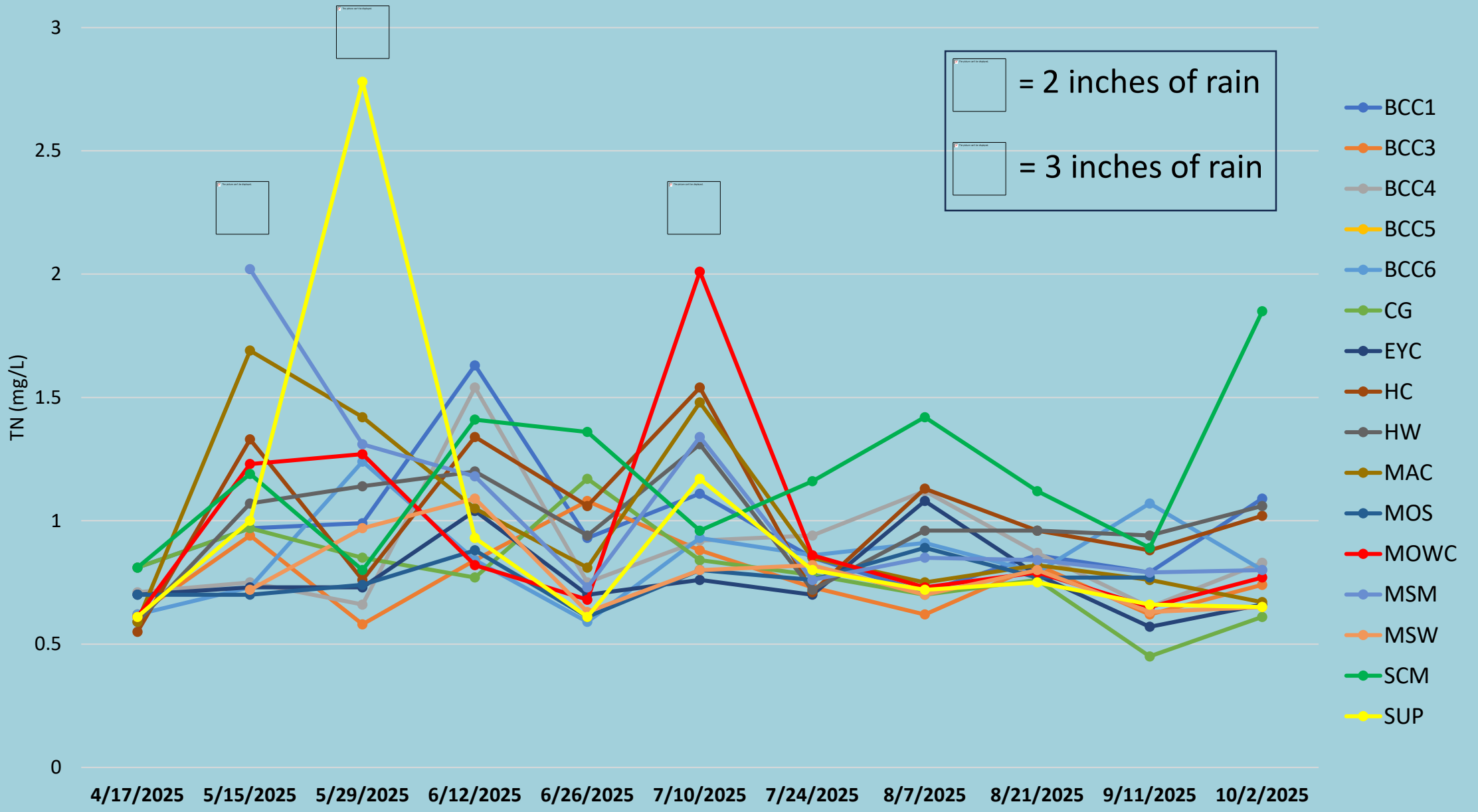
-2024 had 7 values <1.0 mg/L

-2025 had 25 values < 1.0 mg/L

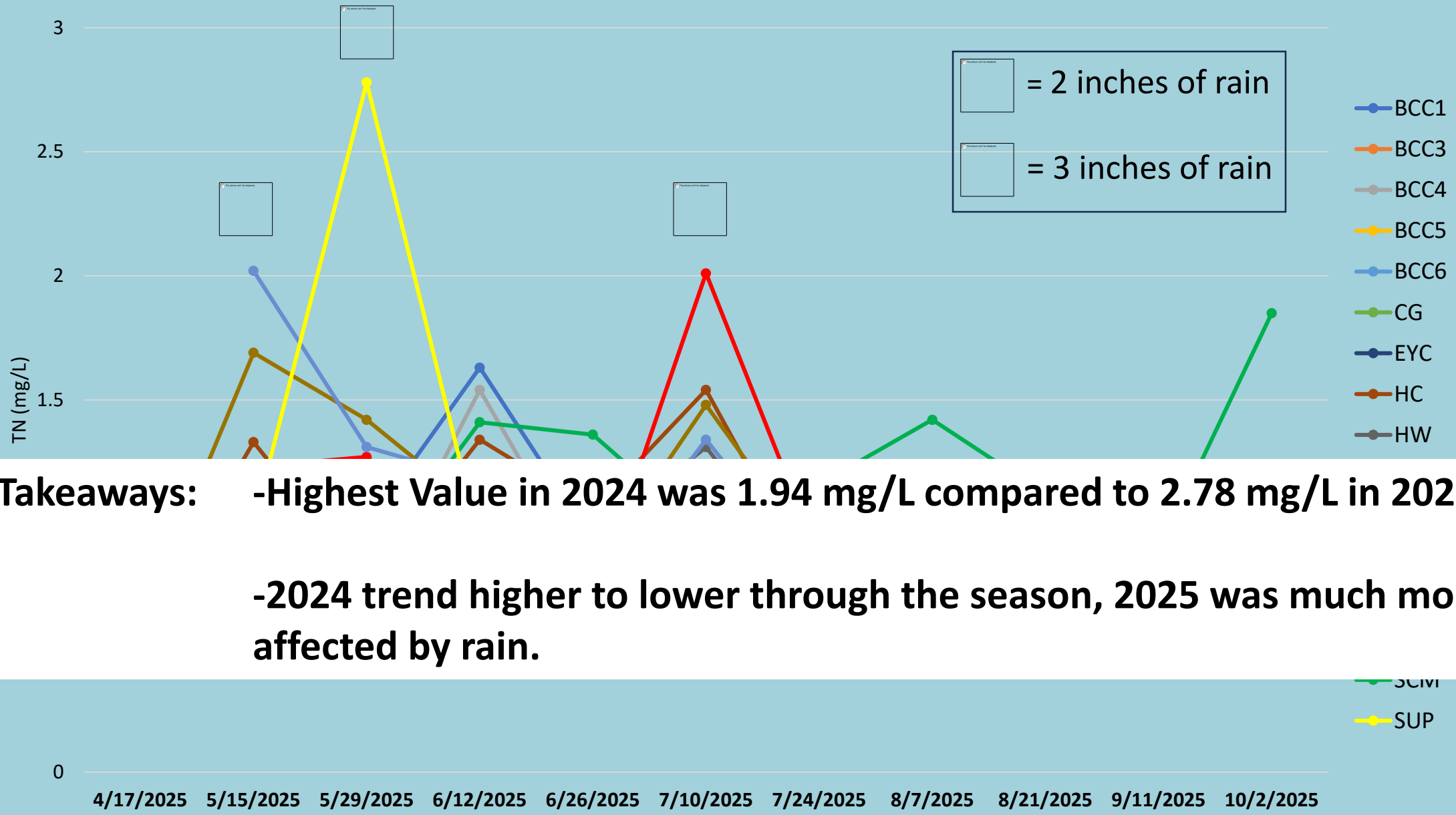
Takeaway: Dissolved Oxygen on both creeks decreased significantly in 2025. Similar pattern in other rivers.

★ Spa and Back Creek values combined 2023 forward

Total Nitrogen



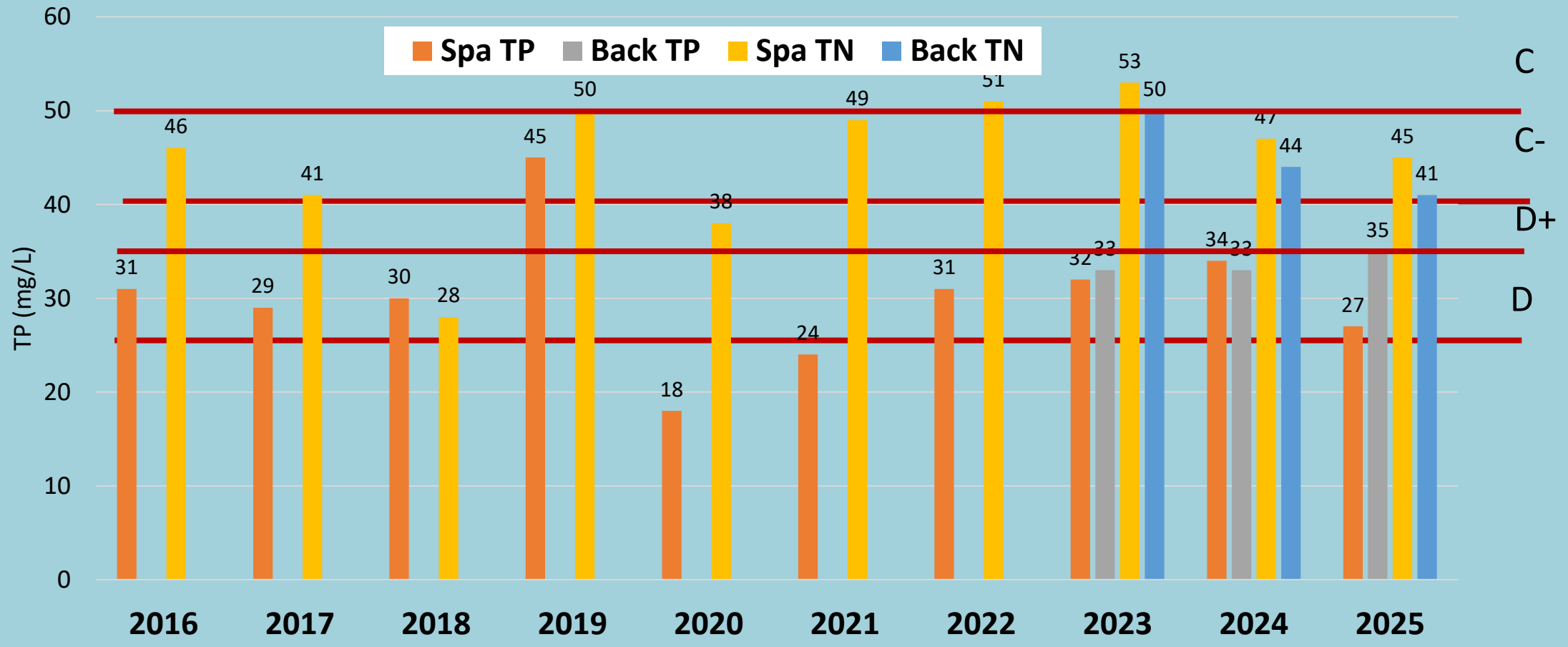
Total Nitrogen



Takeaways: **-Highest Value in 2024 was 1.94 mg/L compared to 2.78 mg/L in 2025.**

-2024 trend higher to lower through the season, 2025 was much more affected by rain.

Total Nitrogen and Total Phosphorous Grades



Takeaway: Spa Total Phosphorous score decreased.

Community Water Quality Stressors and Priority Sites

Stressor	Priority Sites
Rising Water Temperature	MSM MSW, BCC6, BCC4
Low Dissolved Oxygen	MSM HC
Nutrient Pollution	MSM MSW
Excess Algae (Chlorophyll)	MSM, BCC6, BCC4
Sediment & Turbidity	EYC MOS

The Good News (and why it matters)

- ✓ This is a coherent system, not a chaotic one.
- ✓ The biggest driver appears to be physical, not runaway nutrients
- ✓ Several sites are genuinely stable (or improving)
- ✓ Highest priority sites are few, not everywhere

Thanks to funding sources and collaborators:

- Volunteers (Patrick, Donna, Jim, Amy, Dan)
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- EYC Environmental Committee
- SERC CWW for Aquafluor (Tara Sill)
- Eastport-a-Rockin
- AACC techs (Jason Burkholder- Full-time at AACC)
- Live Water and CAP SUP (Kevin and Brian)
- Annapolis Public Works

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