Nitrogen, Phosphorus, and Suspended-Sediment Loads and Trends at the Chesapeake Bay River-Input Monitoring Stations: 1985-2014

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Chesapeake Bay Nontidal Network

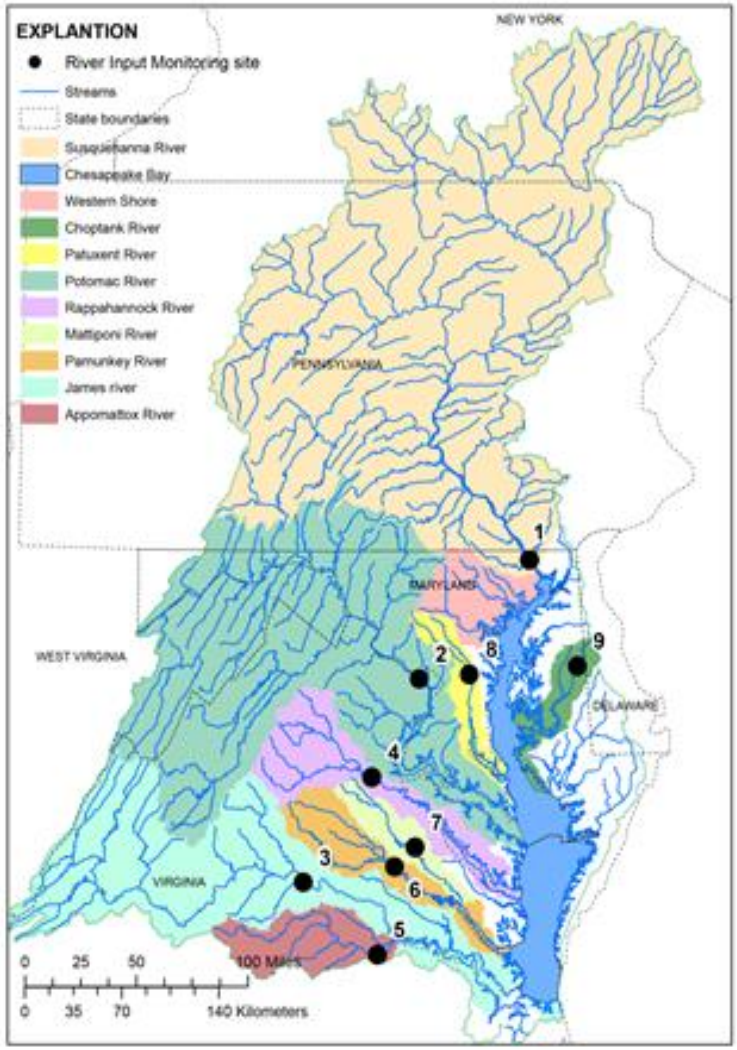


Figure 1. Map showing the location of the 9 River Input Monitoring (RIM) stations in the Chesapeake Bay watershed.

Monitoring: (117-sites)

New York, Pennsylvania, Maryland, Delaware, West Virginia, Virginia, Washington D.C., SRBC, and USGS

Core Questions:

1. **What are the annual loads being delivered past each NTN and ultimately to the Bay?**
2. **How are these loads changing over time?**
3. **Why are these loads changing?**

Analysis and Reporting:

Utilize Weighted Regressions on Time, Discharge, and Season (WRTDS) to compute annual loads and flow-normalized loads

Timeline for Reporting New Loads and Trends:

- **River Input Monitoring Stations – April 2015**
- **Nontidal Network Stations – August 2015**

USGS

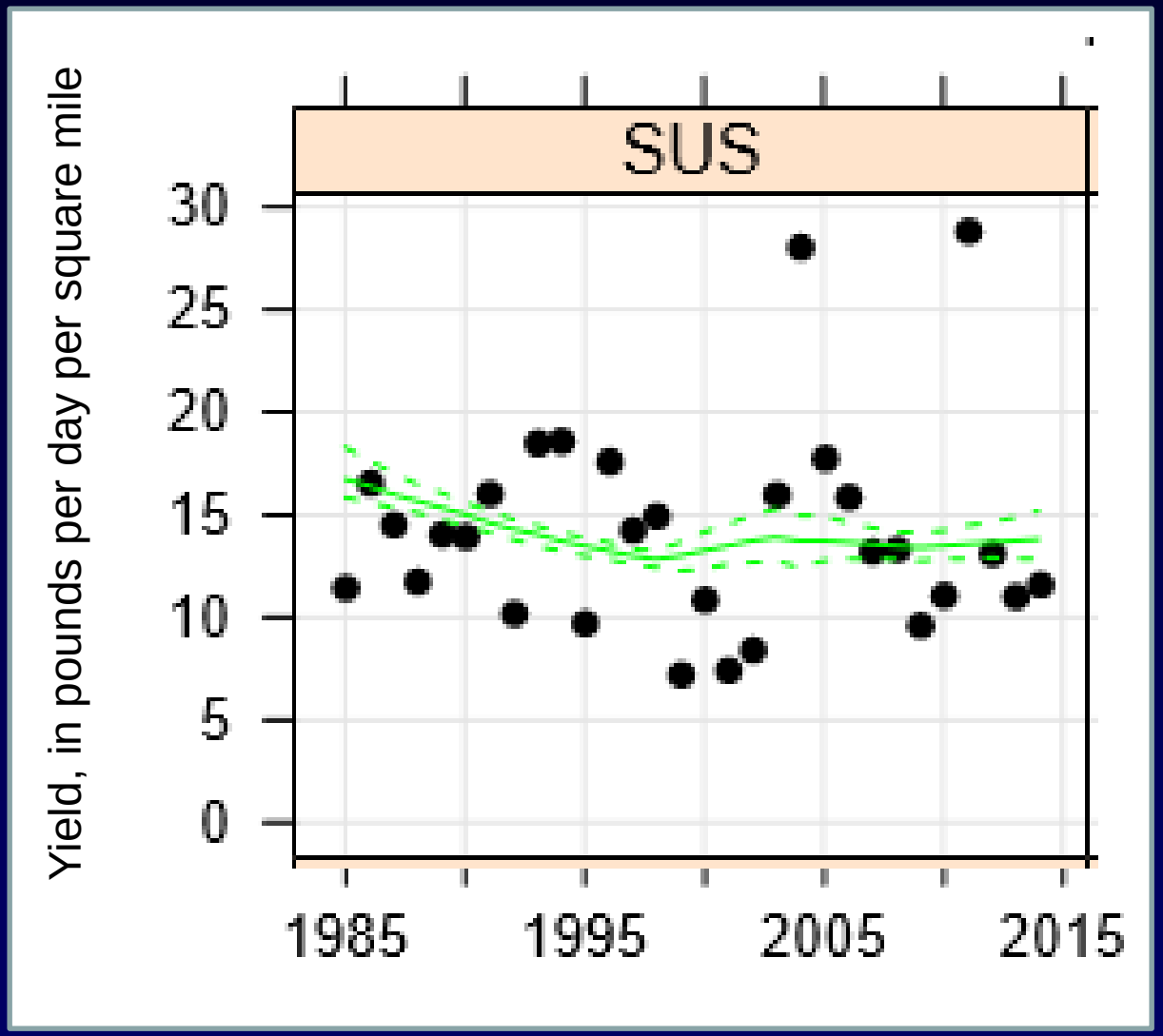
Trends in Total Nitrogen Annual Yield

Total Nitrogen Yield: Susquehanna (RIM)

- Influence of year-to-year variation in flow

Using WRTDS, we flow normalize the yields to adjust for the year-to-year variation in Q

Flow-normalized yields represent the variation in N,P, and S net transport as a result of changes in the watershed.



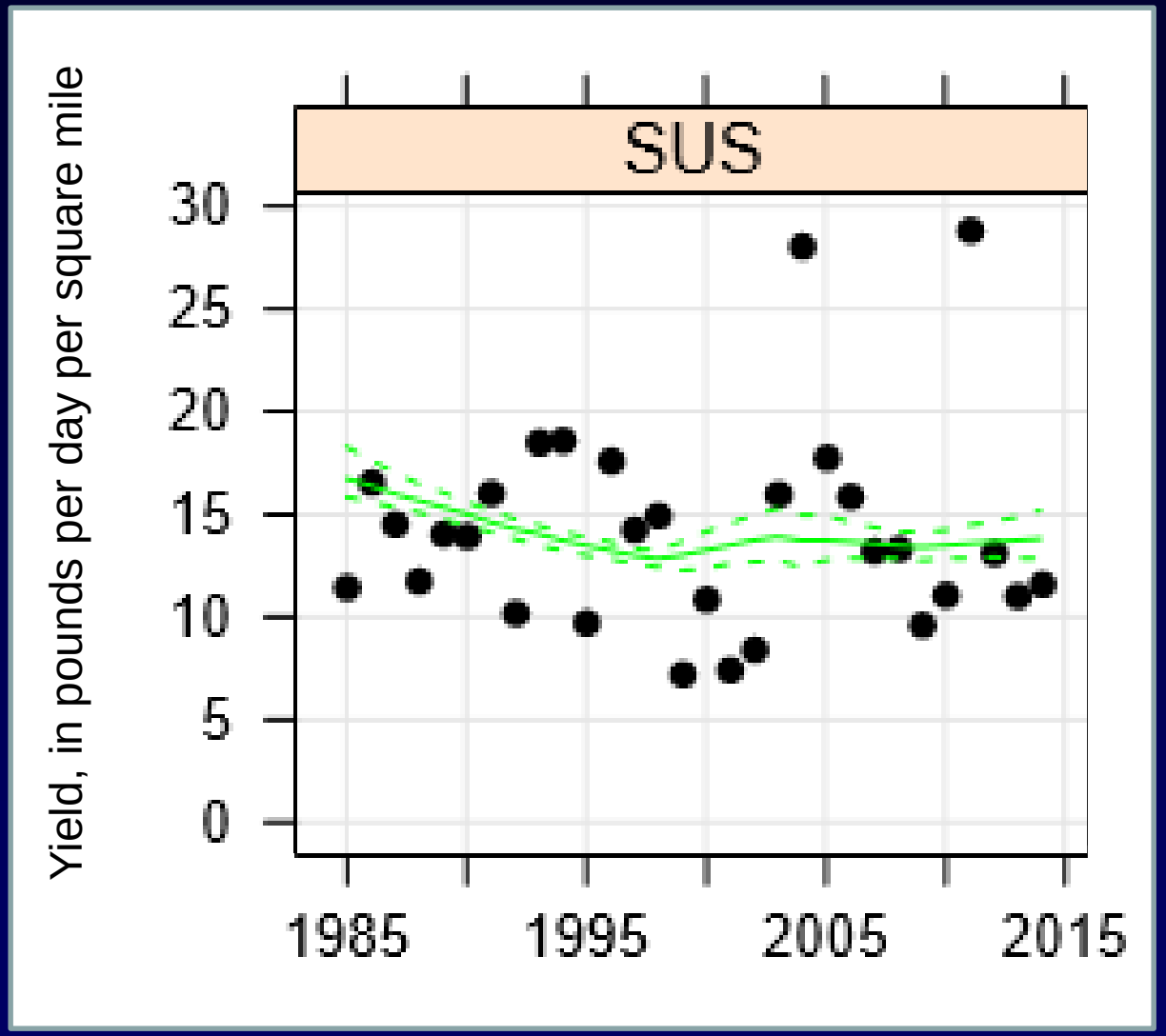
USGS

Trends in Total Nitrogen Annual Load

WRTDS Enhancements:

- **Hypothesis test for trend in flow-normalized load**
- **90% confidence intervals for the magnitude of trend**
- **Qualitative likelihood statements for defining increasing/decreasing trends**

Likelihood values	Descriptors
≥ 0.95 and ≤ 1.00	Extremely Likely
≥ 0.90 and < 0.95	Very Likely
≥ 0.66 and < 0.90	Likely
> 0.33 and < 0.66	As Likely as Not



Significant Trend = Yes

Likelihood = 0.99 → Decreased yielding is "Extremely Likely"

USGS

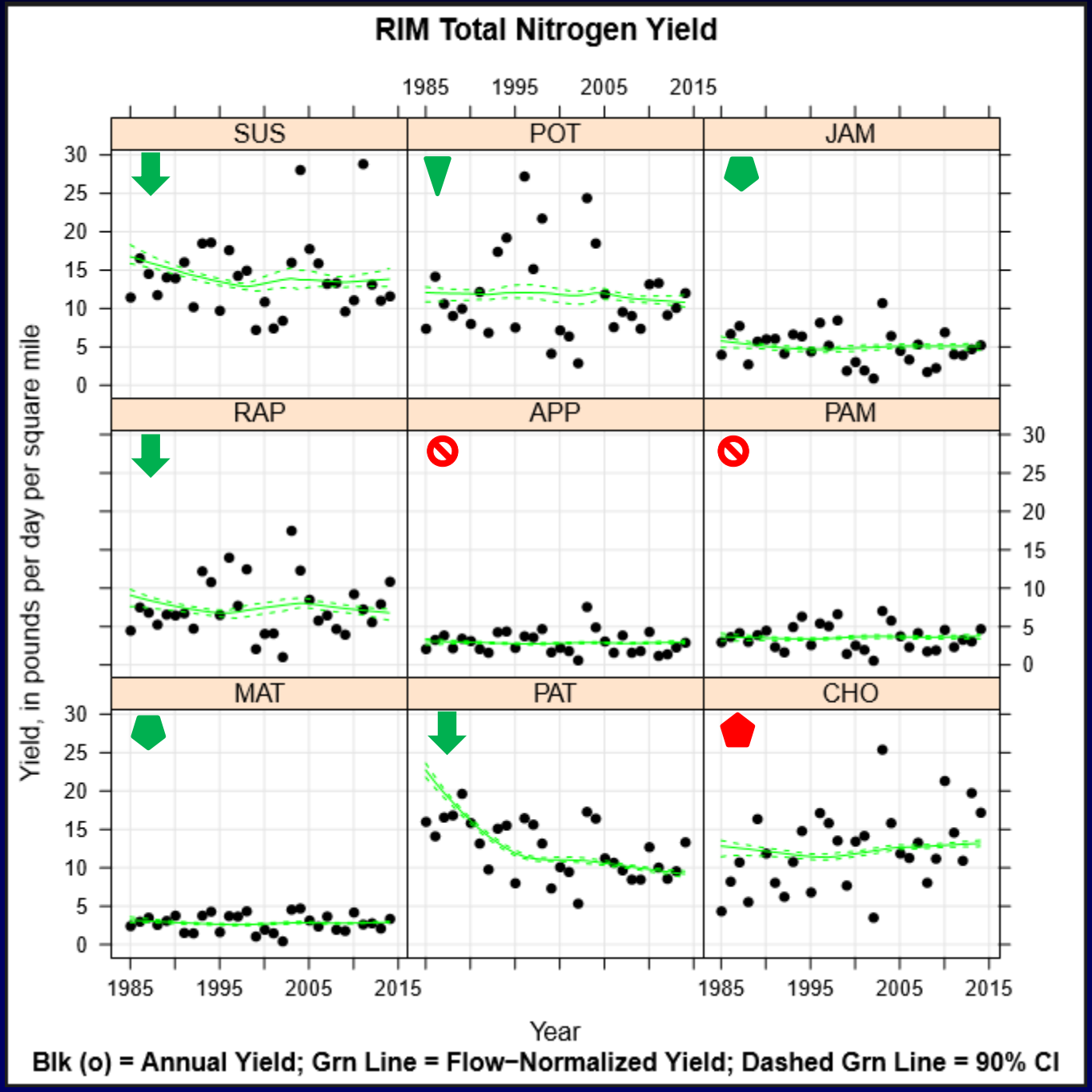
Trends in FN Yield 1985-2014

Extremely Likely
Degrading - 0
Improving - 3

Very Likely
Degrading - 0
Improving - 1

Likely
Degrading - 1
Improving - 2

As Likely as Not
2 stations



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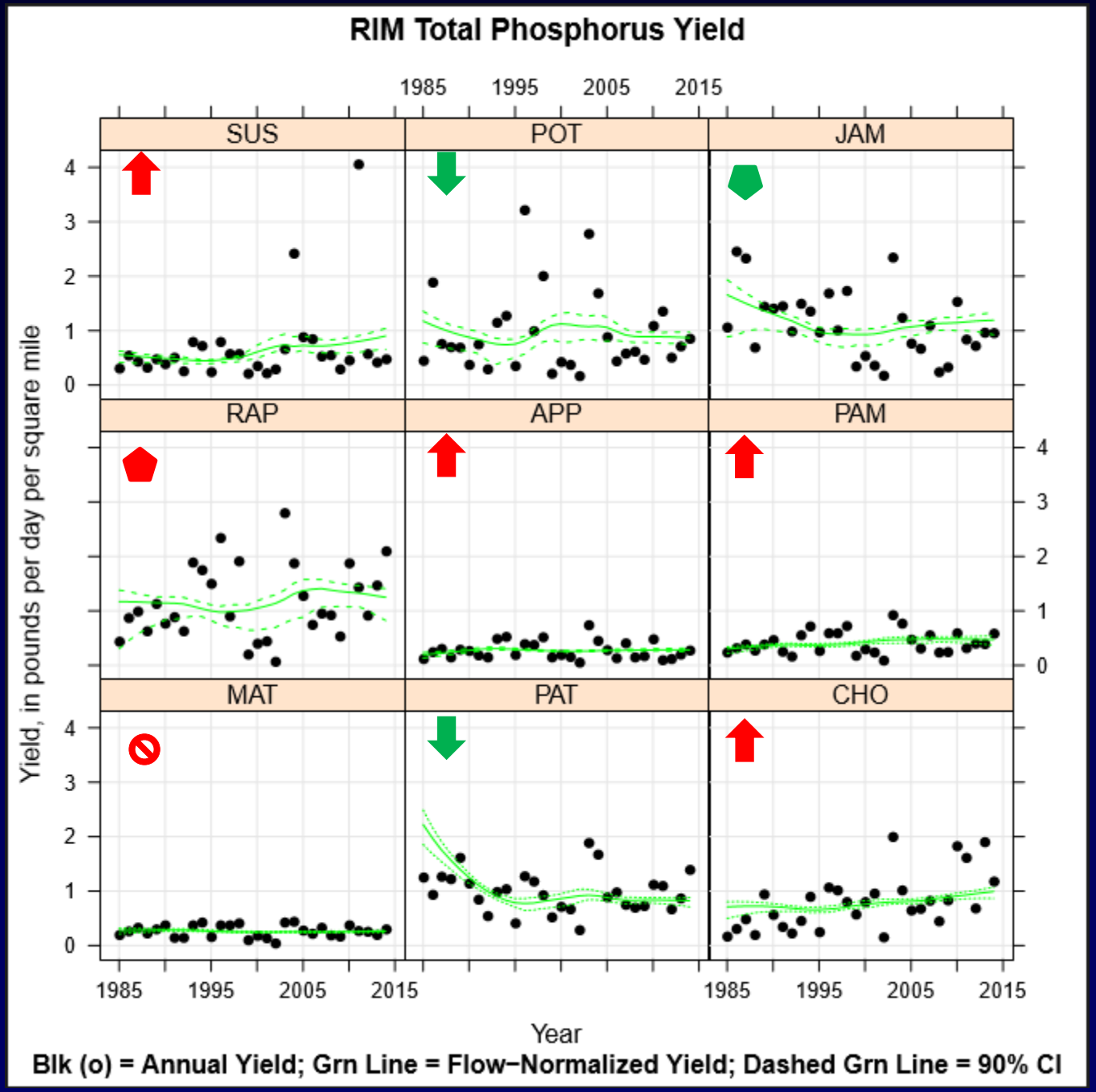
Trends in FN Yield 1985-2014

Extremely Likely
Degrading - 4
Improving - 2

Very Likely
Degrading - 0
Improving - 0

Likely
Degrading - 1
Improving - 1

As Likely as Not
1 station



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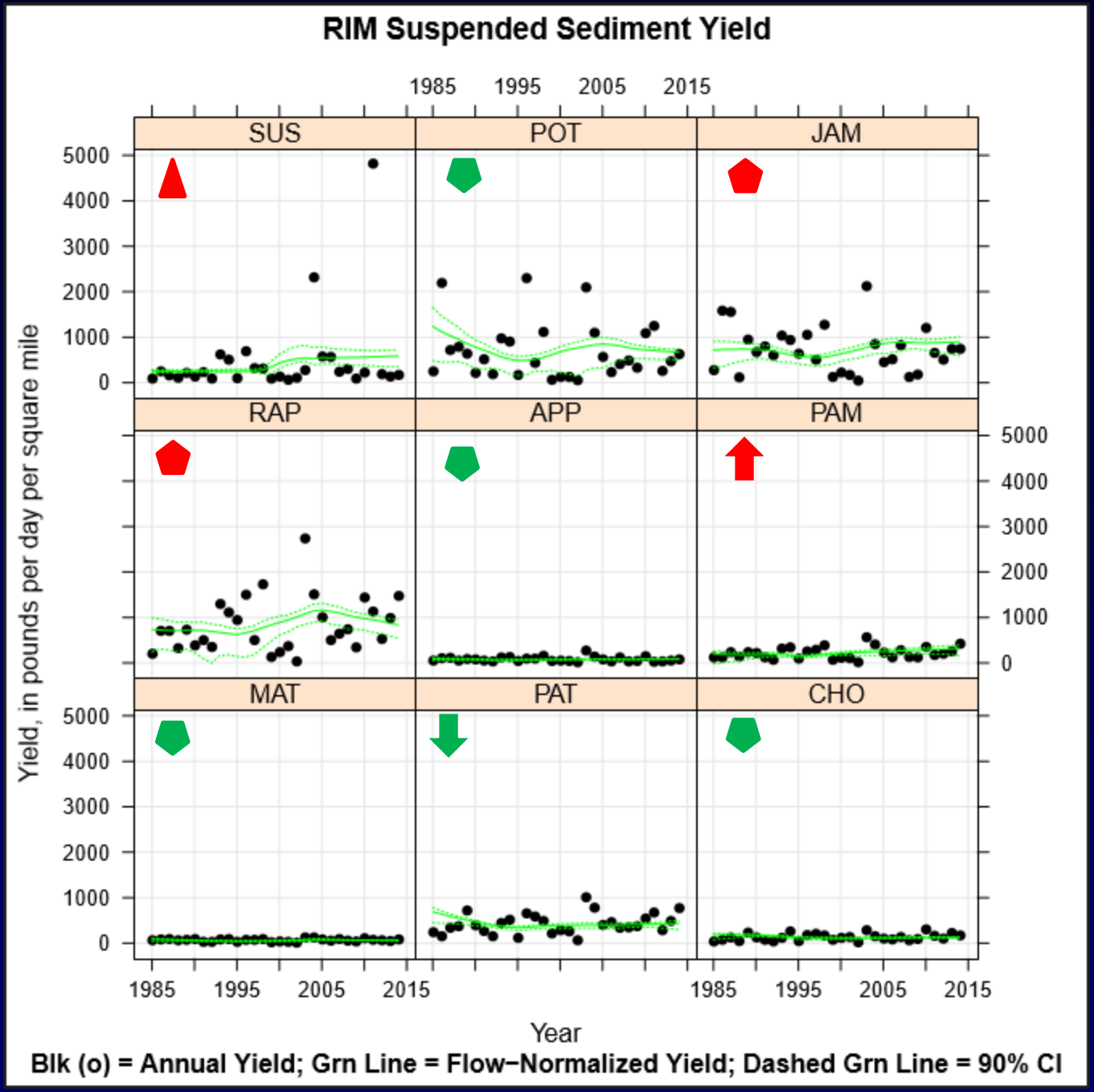
Trends in FN Yield 1985-2014

Extremely Likely
Degrading - 1
Improving - 1

Very Likely
Degrading - 1
Improving - 0

Likely
Degrading - 2
Improving - 4

As Likely as Not
0 Stations



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Questions and Discussion

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