

Event-Based Variability in Particulate
Dioxin/Furan Concentrations in the Surface
Waters of the Passaic River-Newark Bay Complex

THE NJ TOXICS REDUCTION WORKPLAN FOR
NY-NJ HARBOR

Passaic River Symposium
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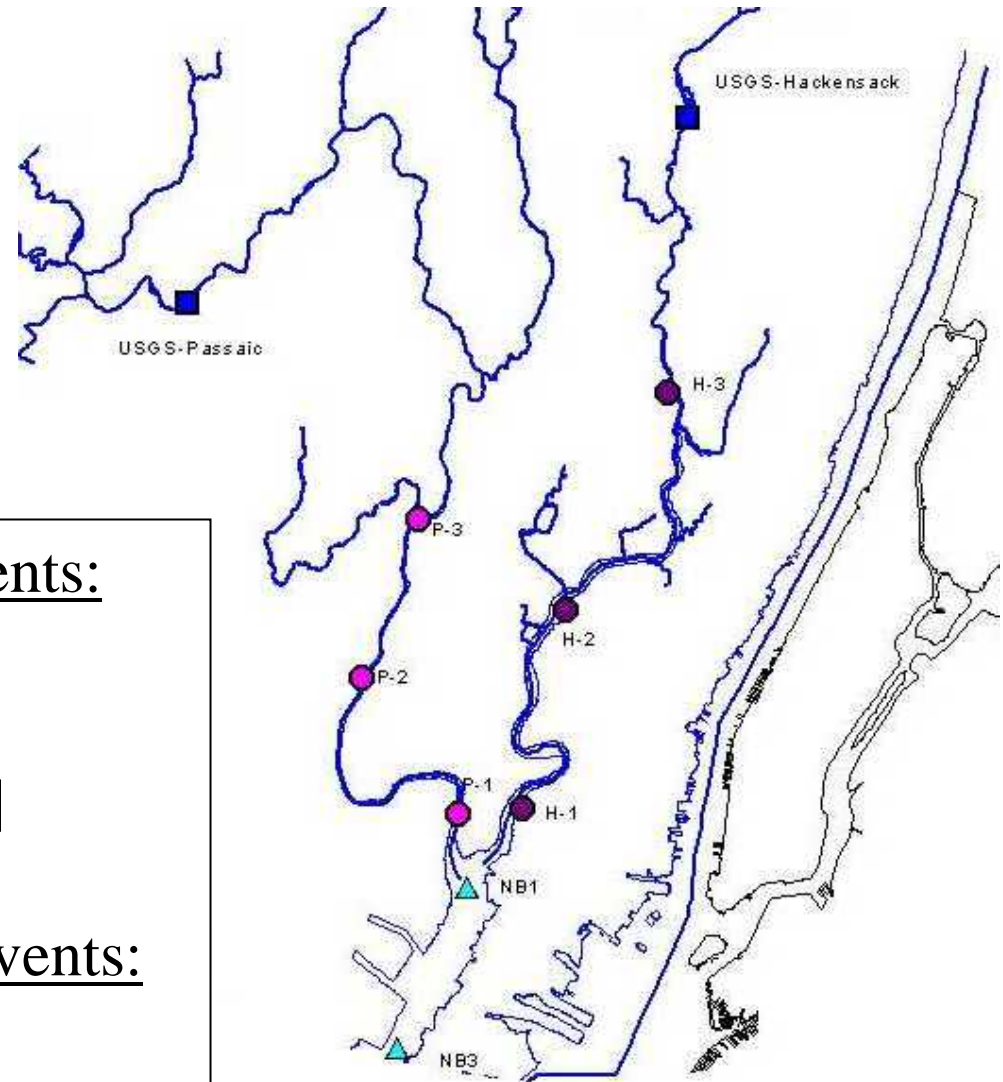
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NJTRWP Passaic River-NB Complex Sampling

- Surface Water - TOPS
- Synoptic - Ebb Tide
- USEPA Method 1613b



Dry Weather/Baseflow Events:

- October 2001

- March 2002

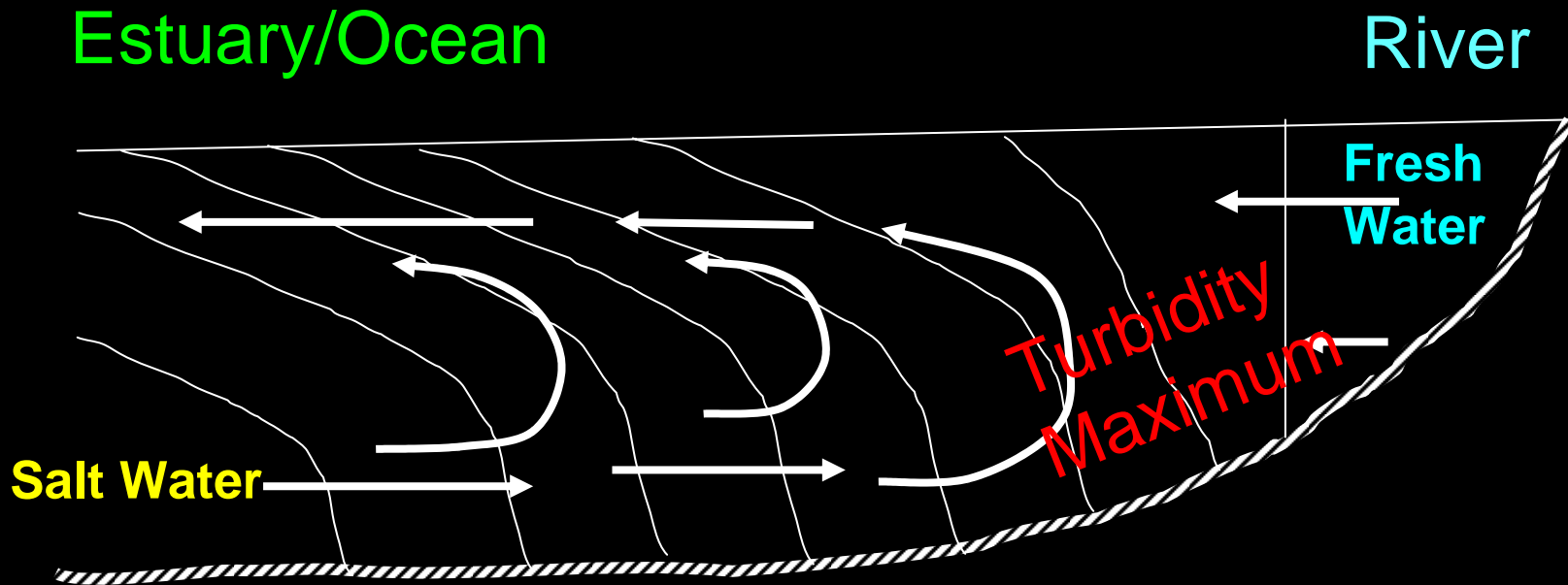
[June 2000 - some stations]

Wet Weather/High Flow Events:

- December 2000

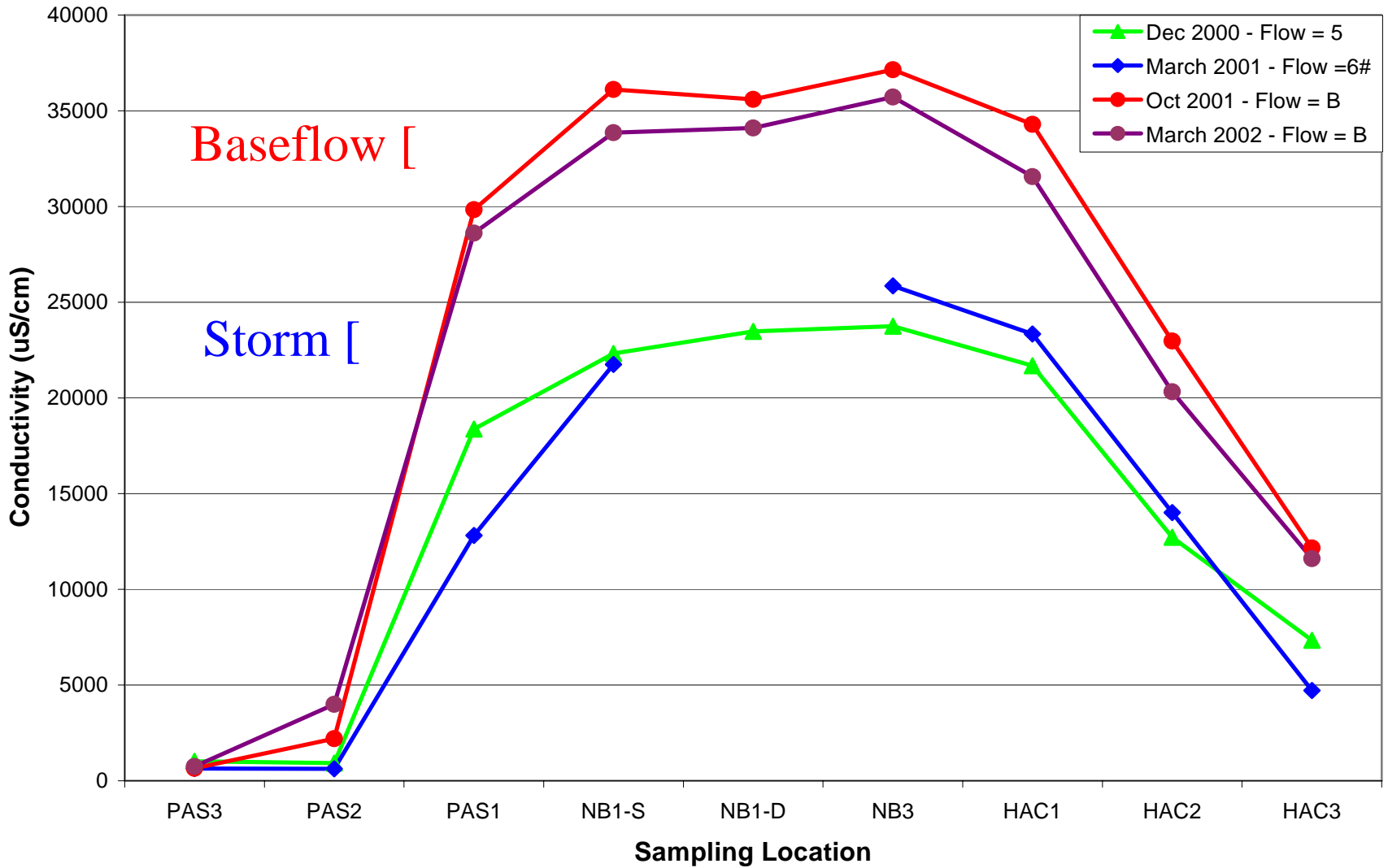
- March 2001

Estuarine Circulation & Sampling

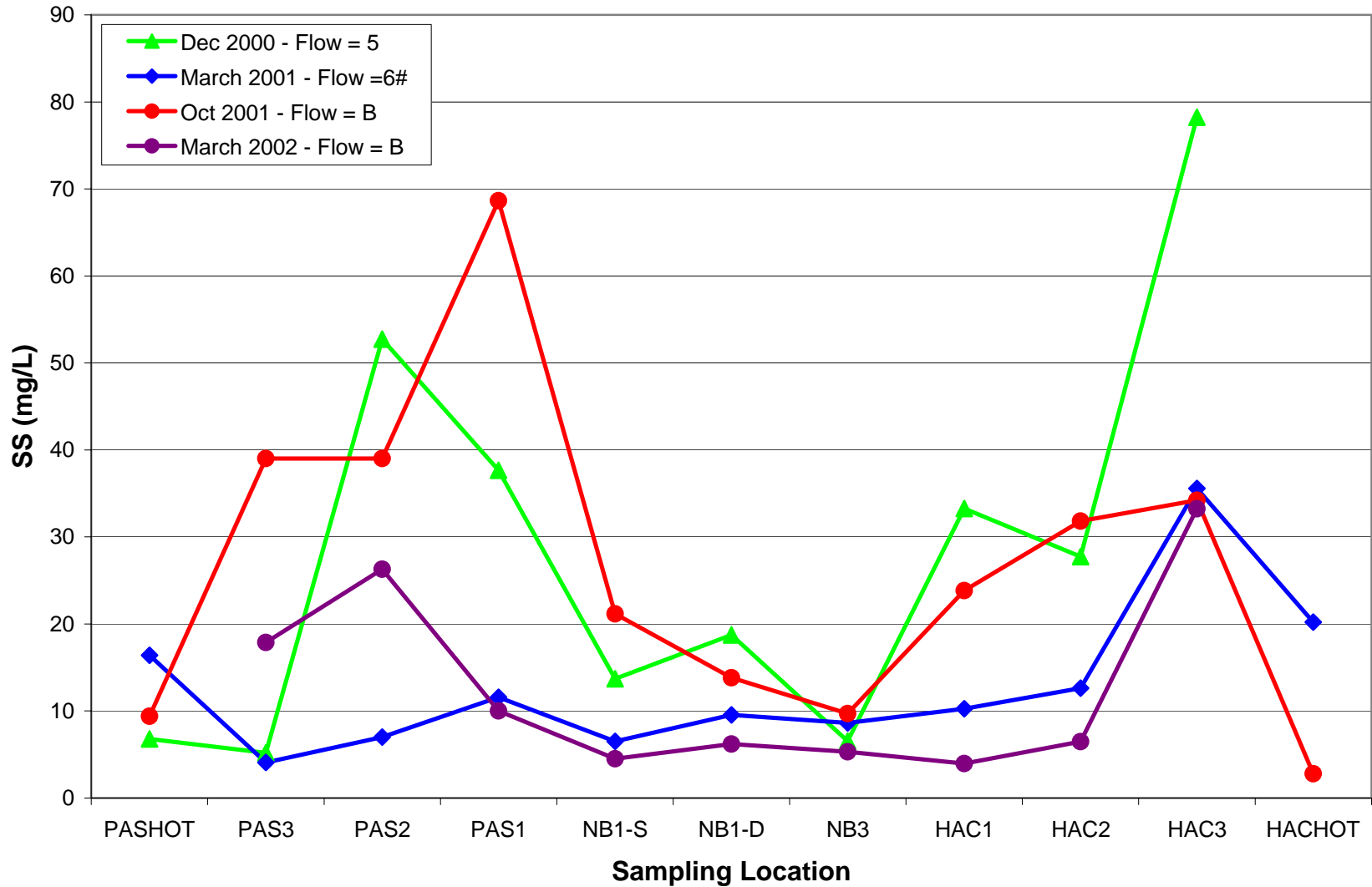


Heavier and saltier water flows under the lighter and fresher seaward-flowing river water. This results in converging near bottom flows that accumulate suspended material near the head of the salt wedge.

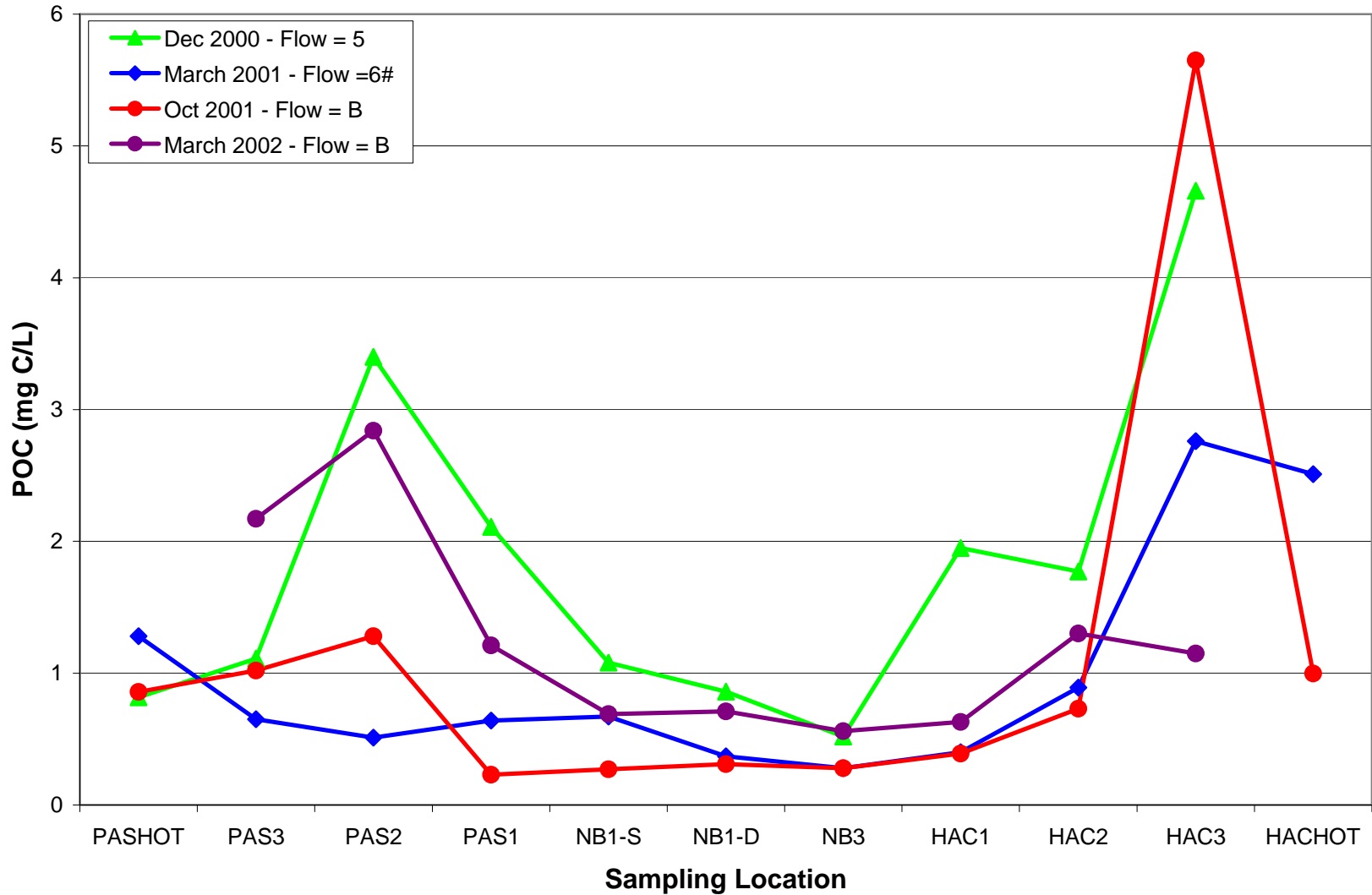
NJTRWP Passaic River-Newark Bay Complex Mean Conductivity



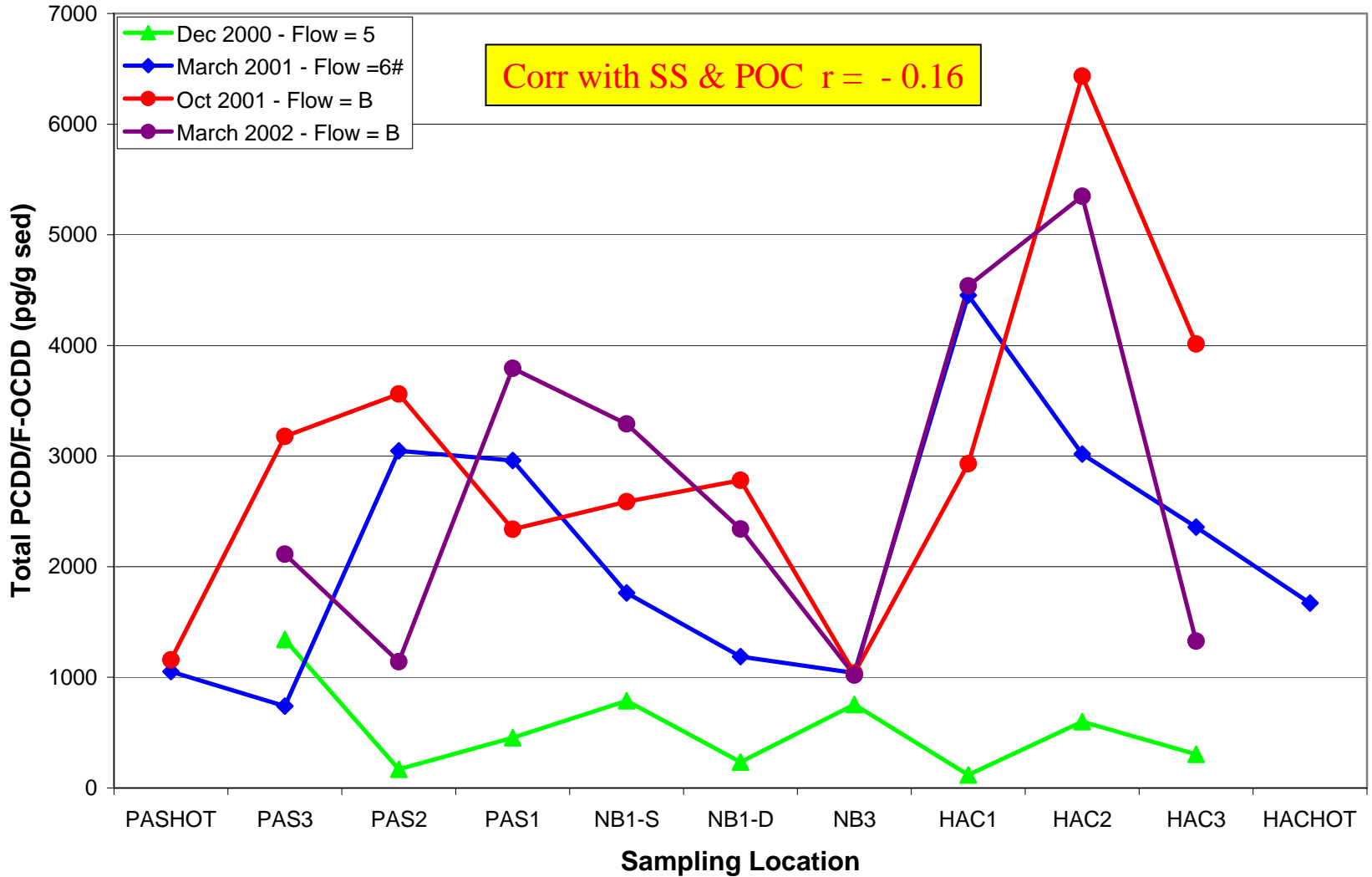
NJTRWP Passaic River-Newark Bay Complex Suspended Sediment



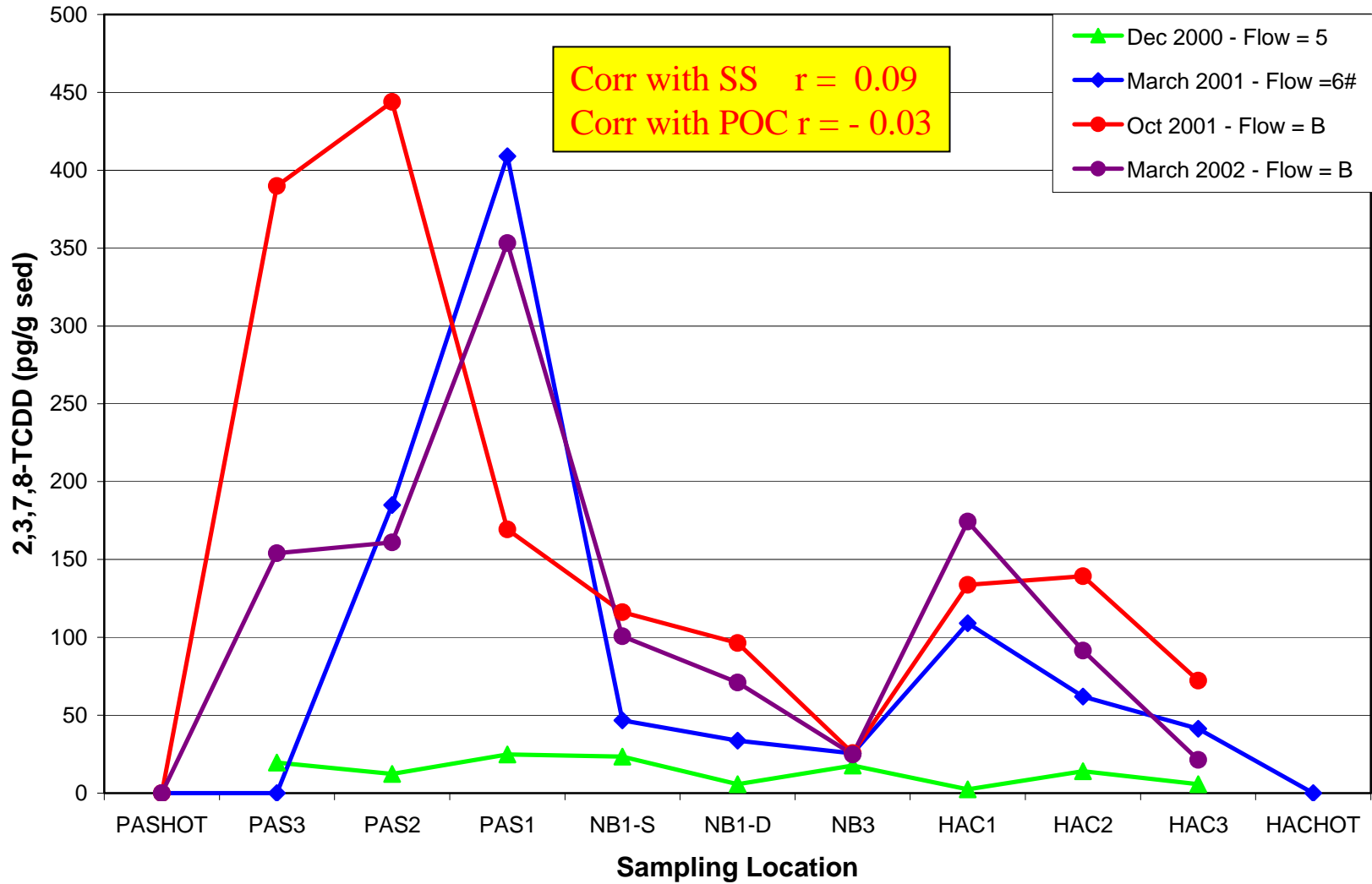
NJTRWP Passaic River-Newark Bay Complex Particulate Organic Carbon



NJTRWP Passaic River-Newark Bay Complex Total PCDD/Fs - OCDD

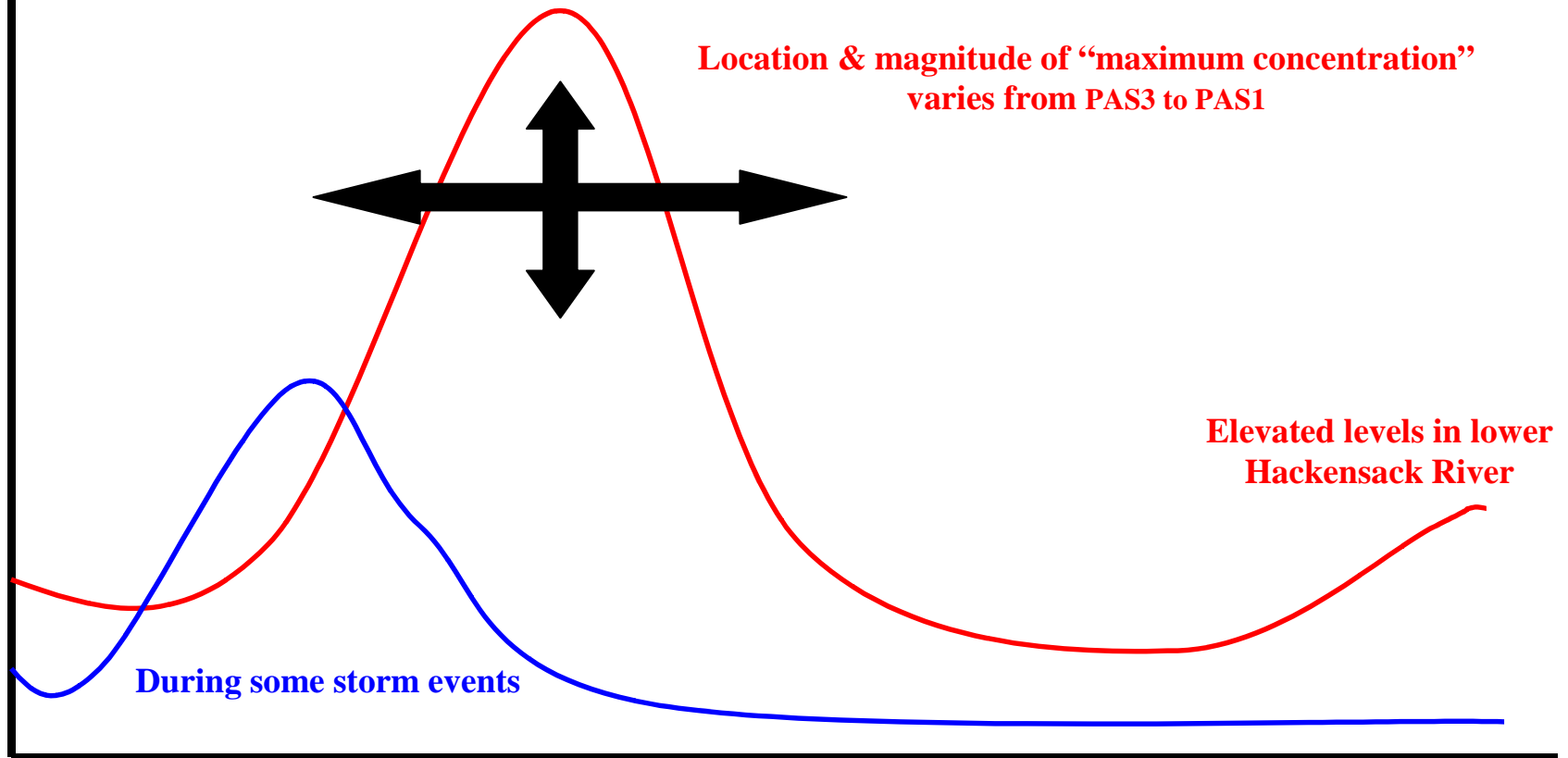


NJTRWP Passaic River-Newark Bay Complex 2,3,7,8-TCDD



Hypothesized Conceptual Distribution of Suspended Sediment Dioxin/Furan Concentrations in the Passaic River-Newark Bay Complex

Concentration (pg/g sed)



Passaic River
Head-of-Tide

Station
PAS3

Station
PAS2

Station
PAS1

Newark Bay

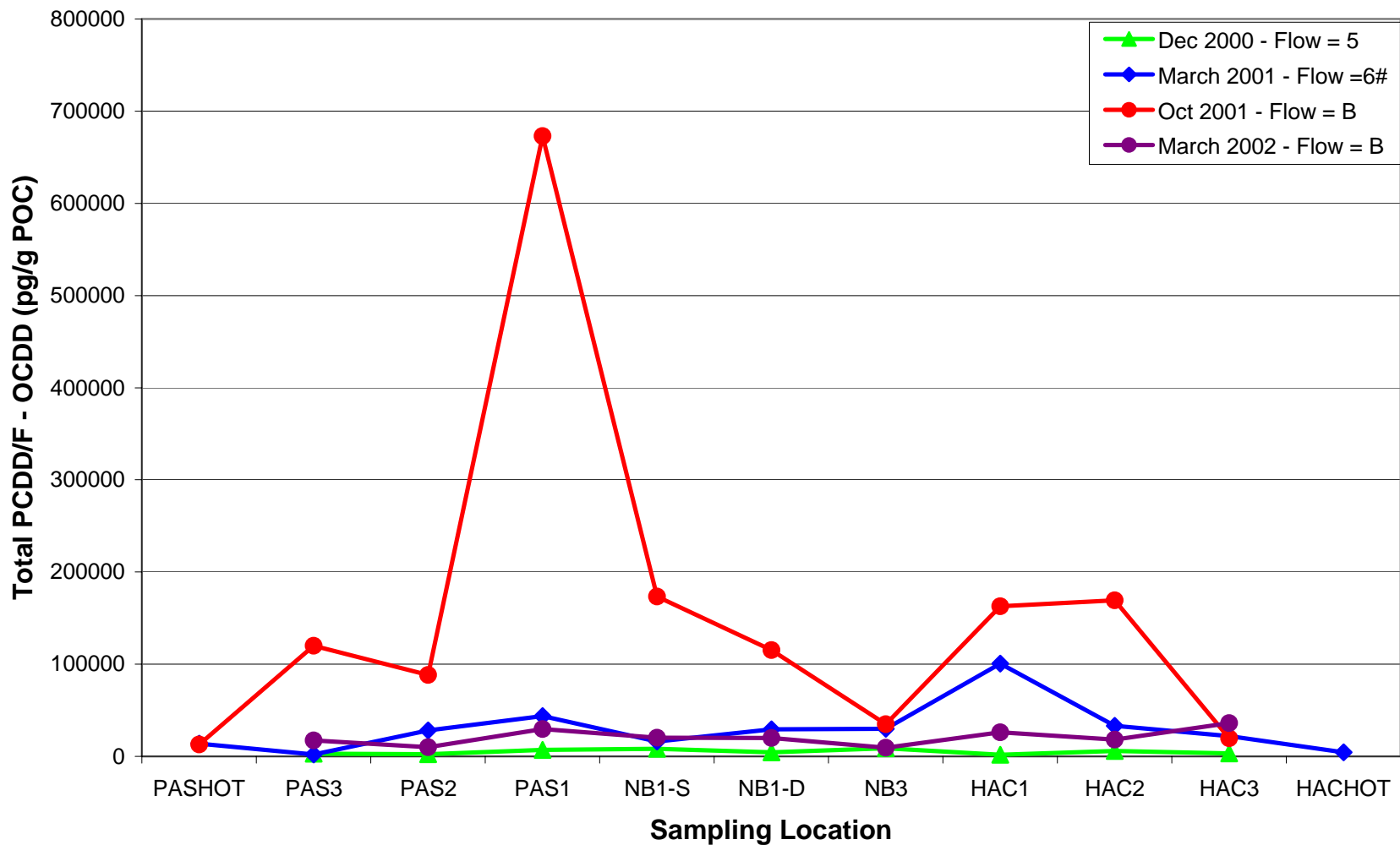
Station
HAC1

Downstream

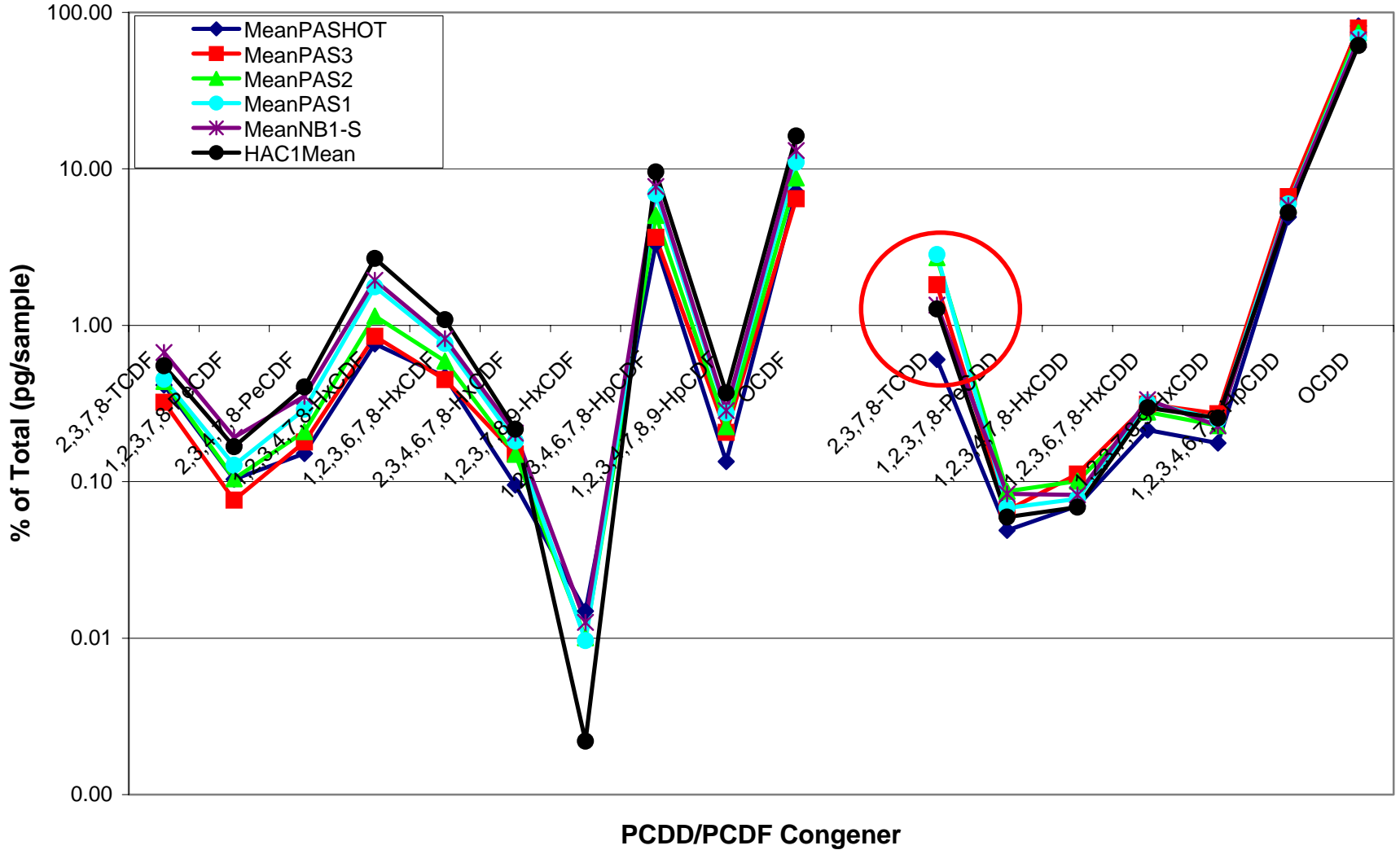


NJTRWP Passaic River-Newark Bay Complex

POC-normalized Total PCDD/F - OCDD



Passaic River Mean PCDD/PCDF Congener Distribution



Summary & Conclusions

- **The transport and fate of PCDD/Fs in the Passaic River-Newark Bay Complex can vary in a complex manner in response to hydrologic conditions.**
- Total PCDD/F-OCDD varies at the sites by a factor of 1.4 (NB3) to 21 (PAS2) to 38 (HAC1) [mean = 13]
- 2,3,7,8-TCDD varies at the sites by a factor of 1.4 (NB3) to 36 (PAS2) to 54 (HAC1) [mean = 19]

Summary & Conclusions

- **Conceptual PCDD/F distribution “model” was developed - use of mean concentrations limited.**
- There was no correlation between SS or POC and 2,3,7,8-TCDD and Total PCDD/F-OCDD
- PCDD/F levels can be “diluted” during storm events by “cleaner” SS
 - CSO/SWO & minor tributary discharges important?

Summary & Conclusions

- **Little variability in mean congener distribution patterns among the sites.**
- **The lower/mid Hackensack River is influenced by the Passaic River**
 - elevated 2,3,7,8-TCDD & TEQ levels
 - also potential source of 2,3,7,8-TCDD and furans in the lower/mid Hackensack River