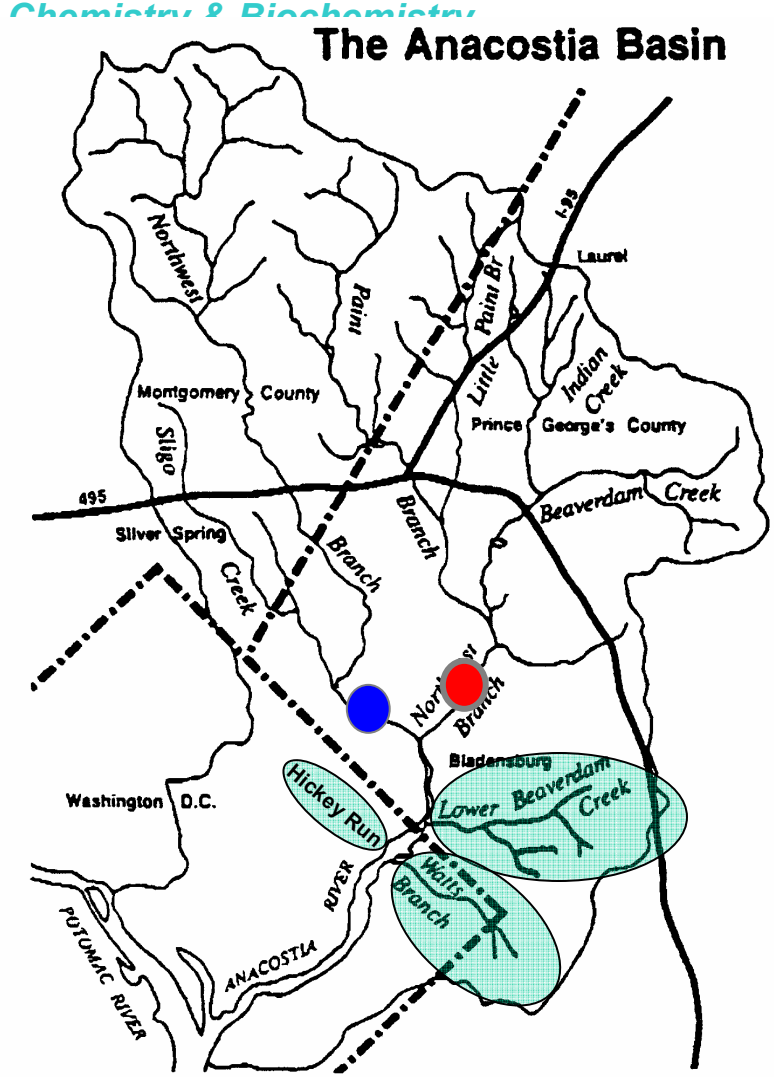
Comparison of Potomac River Basin PCBs in Dissolved and Particle Transport

Objectives

- Overview of measured concentrations from Potomac River Fall Line, Anacostia River Fall Line, Anacostia River CSO (1992-2004)
- Ratio of tPenta/tPCBs
- Hydrologic correlations of PCBs with surrogate variables



NW Branch Station

NE Branch Station

Anacostia Watershed

NE Branch:

sfc. area: 186 km^2

discharge: 1.2×10^8 m^3/y

NW Branch:

sfc. area: 126 km^2

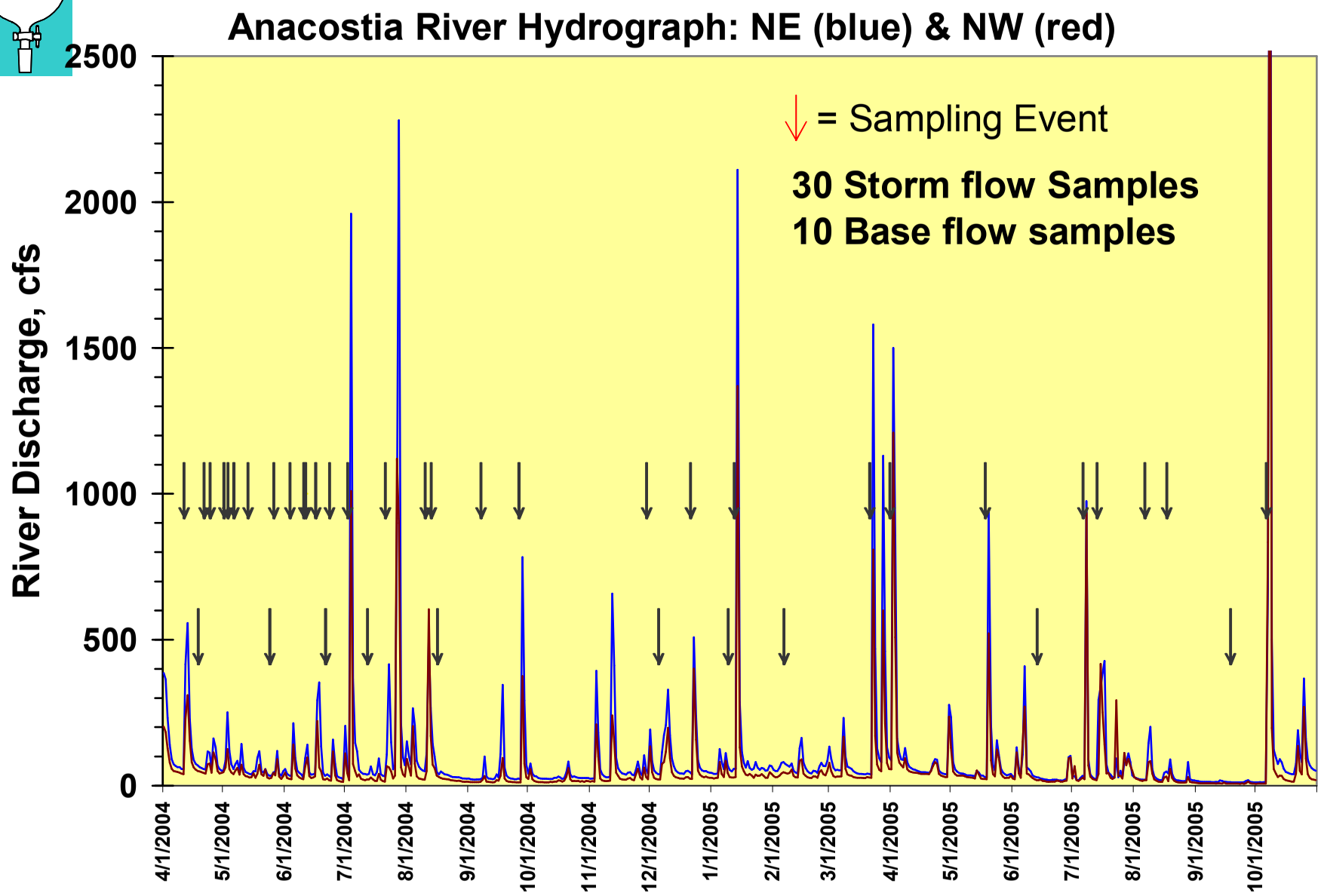
discharge: 7.0×10^7 m^3/y

Tidal Region:

sfc. area: 3.3 km^2

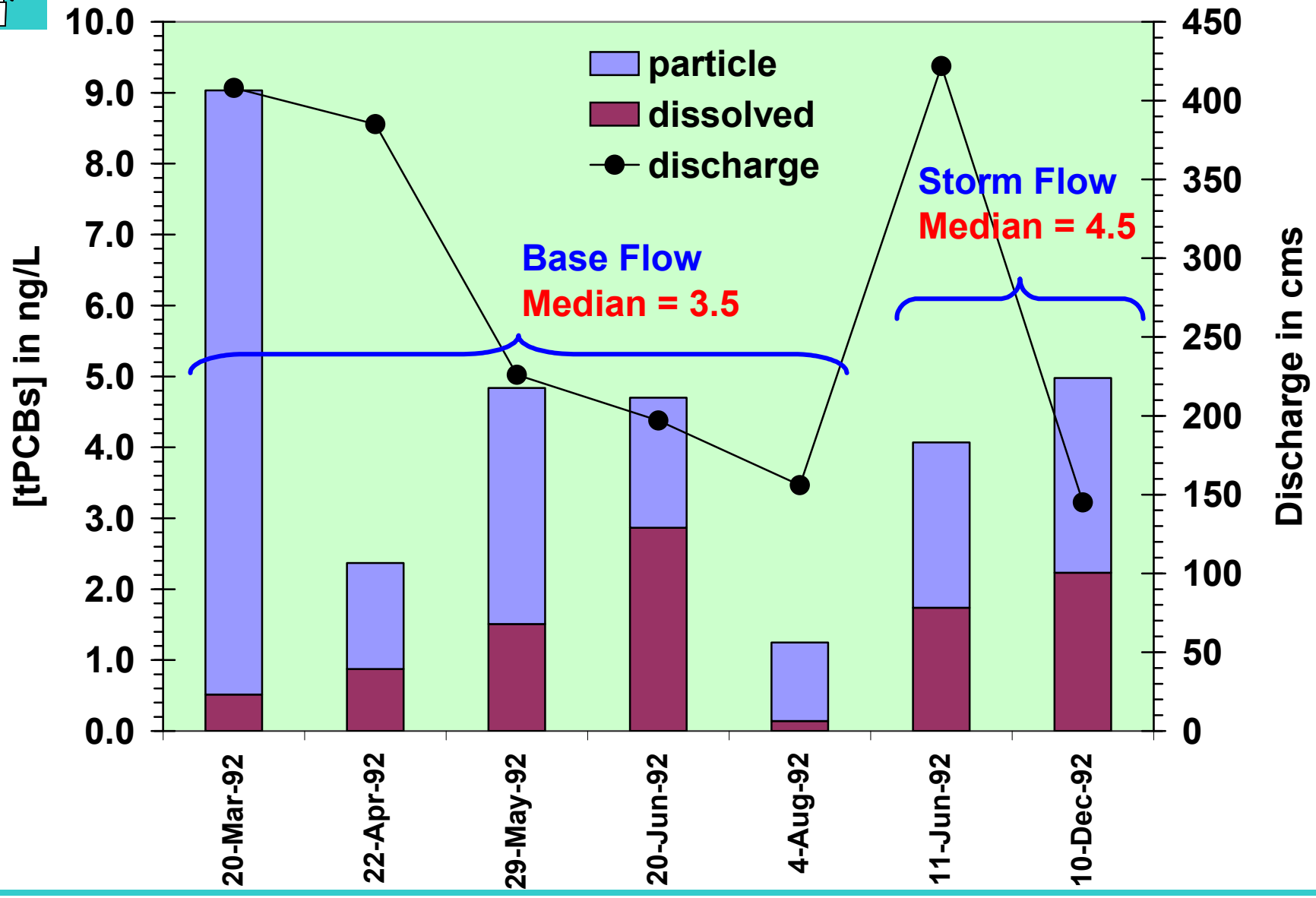
volume: 1.4×10^6 m^3

turnover: ~35 d

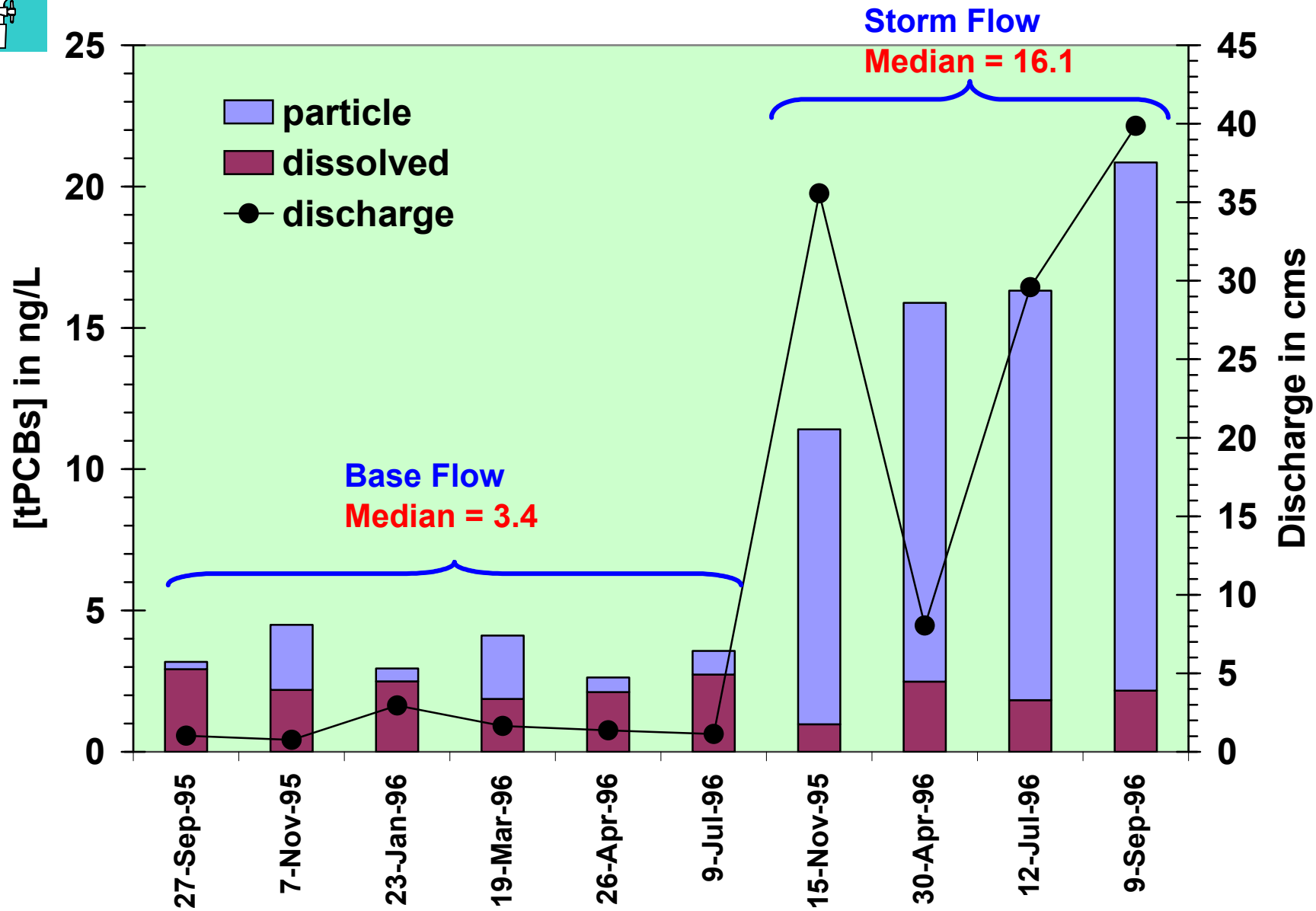

Anacostia River Hydrograph: NE (blue) & NW (red)
River Discharge, cfs
2500
2000
1500
1000
500
0
= Sampling Event
30 Storm flow Samples
10 Base flow samples
4/1/2004
5/1/2004
6/1/2004
7/1/2004
8/1/2004
9/1/2004
10/1/2004
11/1/2004
12/1/2004
1/1/2005
2/1/2005
3/1/2005
4/1/2005
5/1/2005
6/1/2005
7/1/2005
8/1/2005
9/1/2005
10/1/2005

ng/L tPCBs	Median (all)	Max	Min
1992 FLine			
Chain Br (PR)	4.4	9.0	0.3
1995 FLine			
NE (AR)	4.3	20.8	2.6
NW (AR)	3.2	28.9	2.0
2002 CSO			
LBD Cr	11.8	340	4.3
Hickey Run	12.1	42	0.91
Watts Br	6.1	184	1.6
2004 FLine			
NE (AR)	2.8	15.7	0.11
NW (AR)	4.0	12.6	0.25

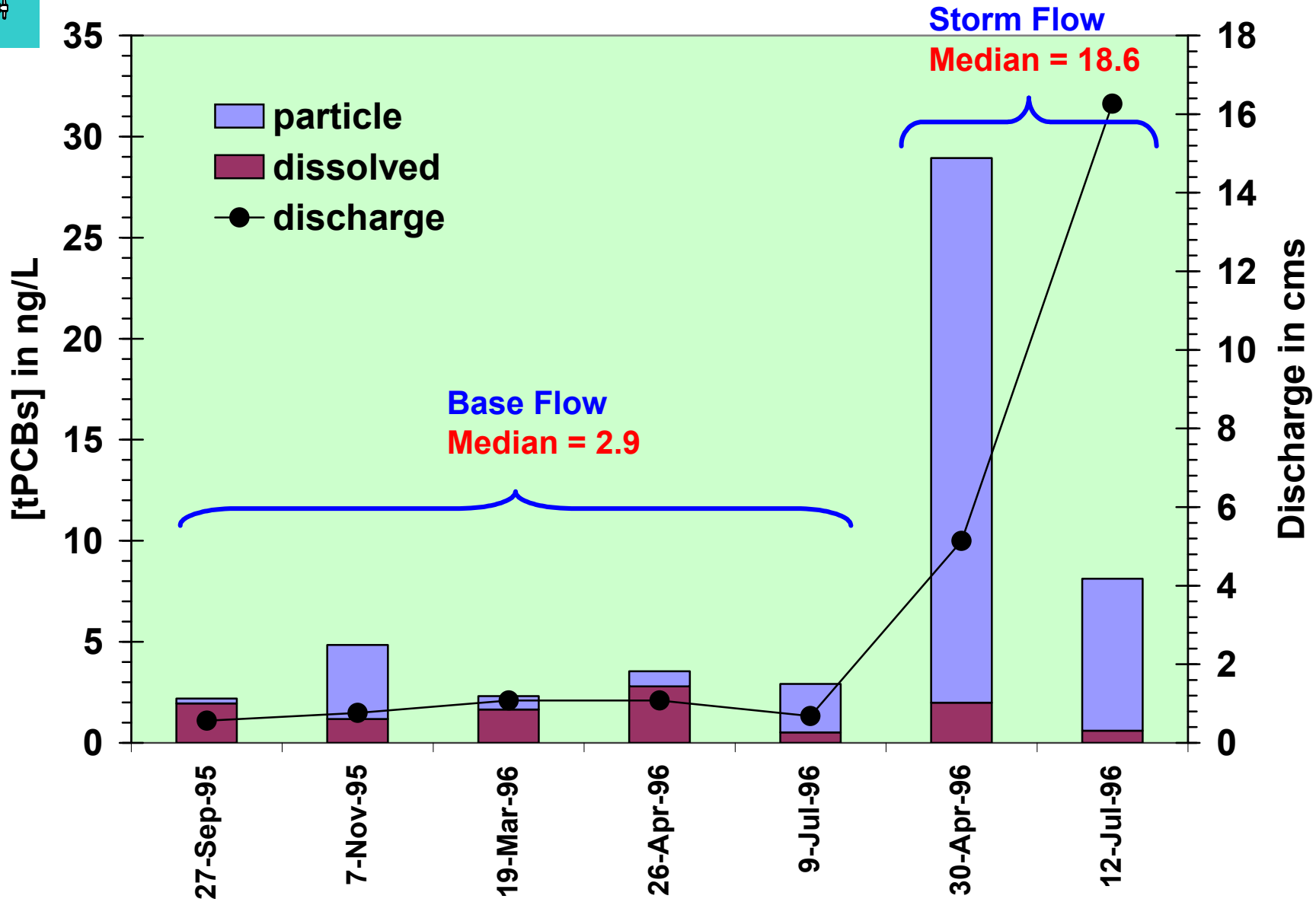
Potomac R Fall Line 1992



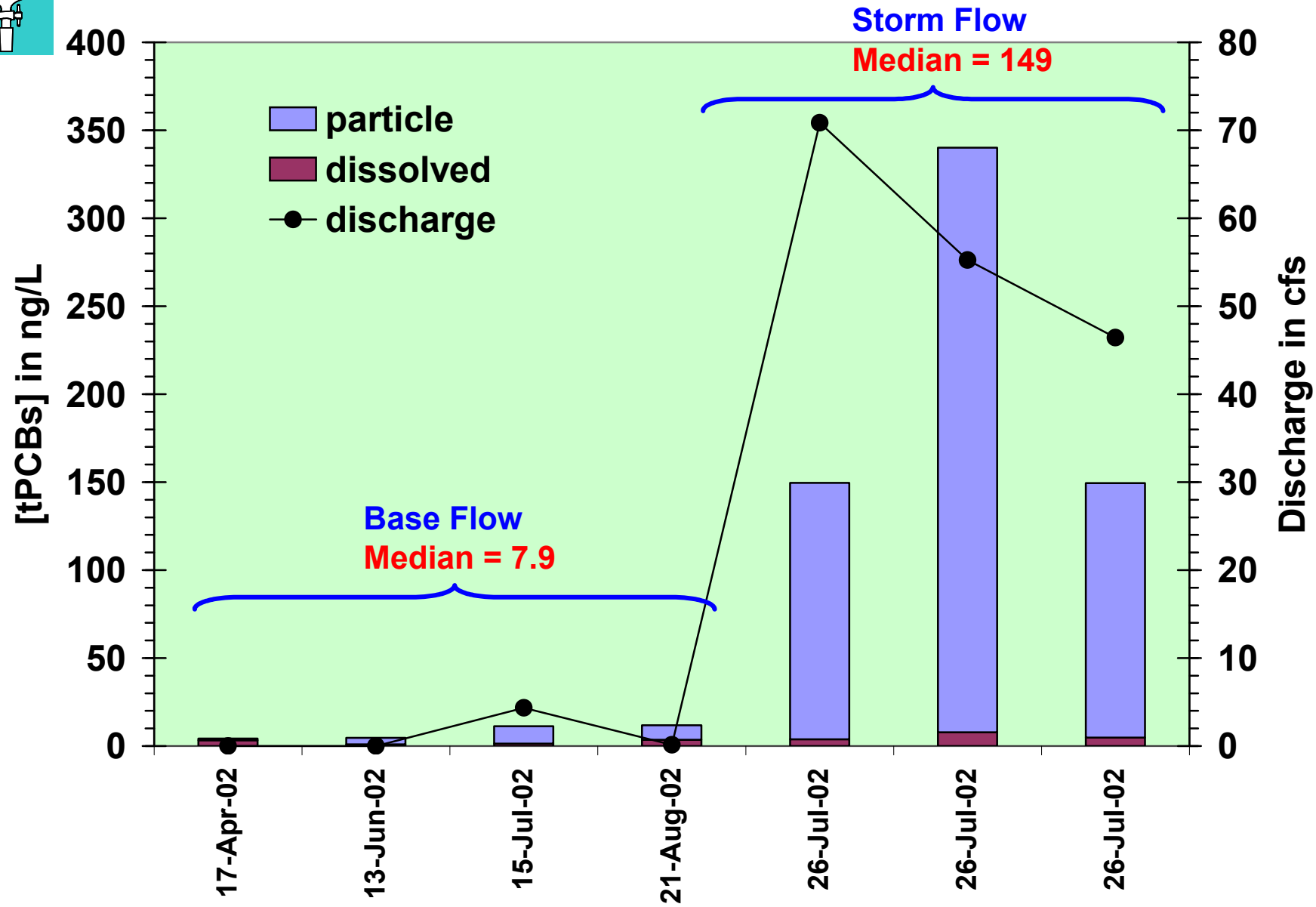
NE Branch AR 1995/1996



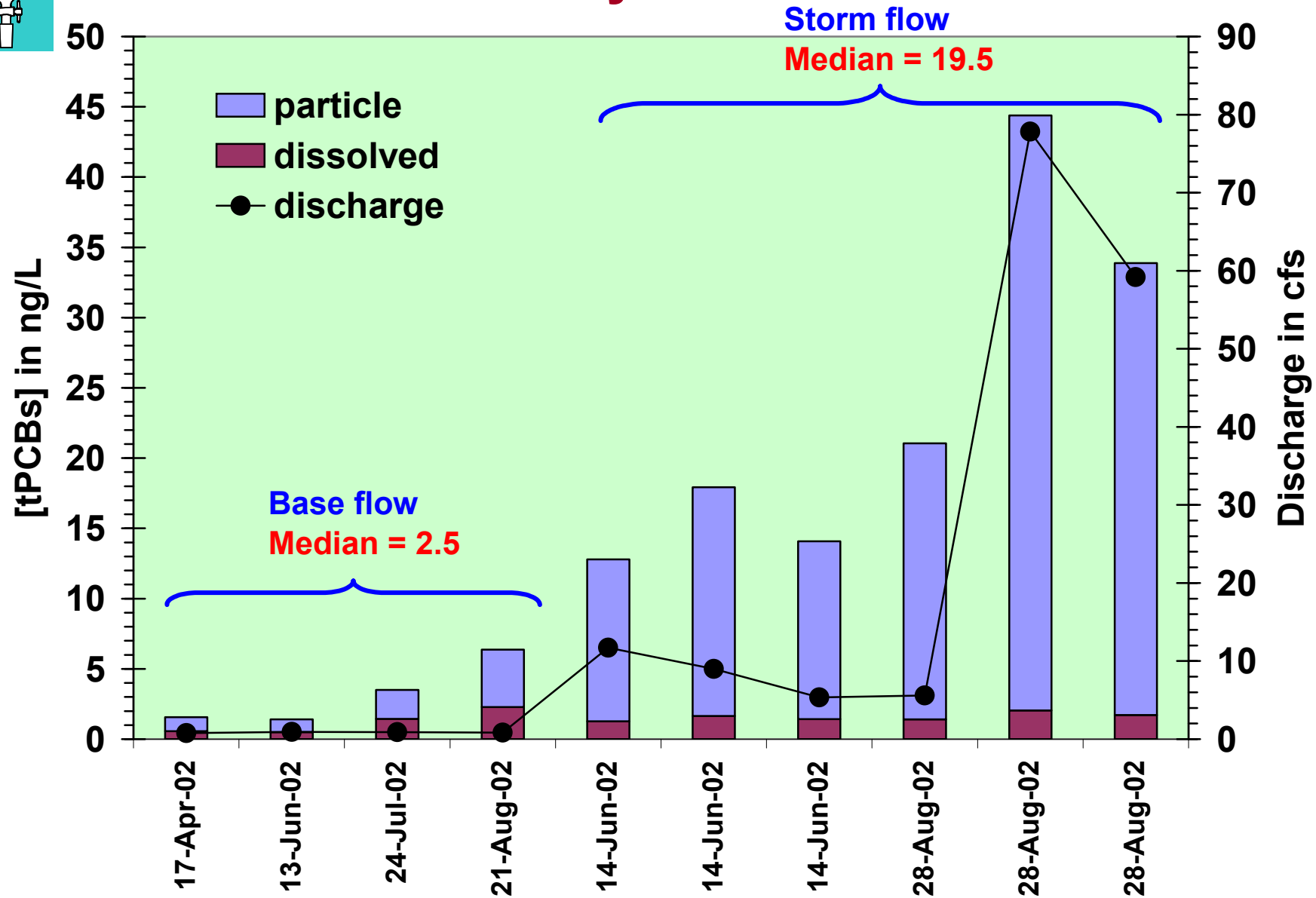
NW Branch AR 1995/1996



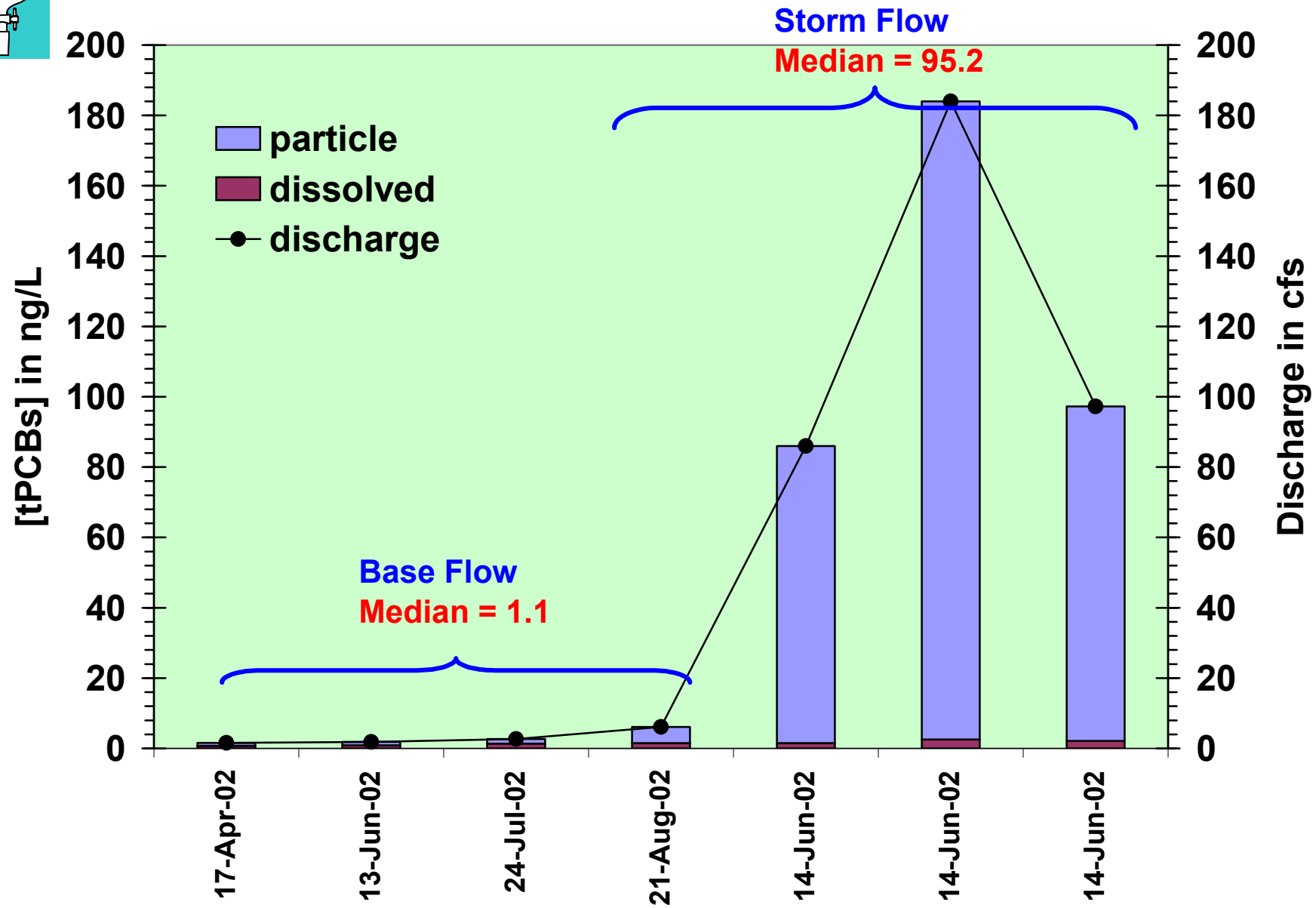
Lower Beaverdam Creek 2002



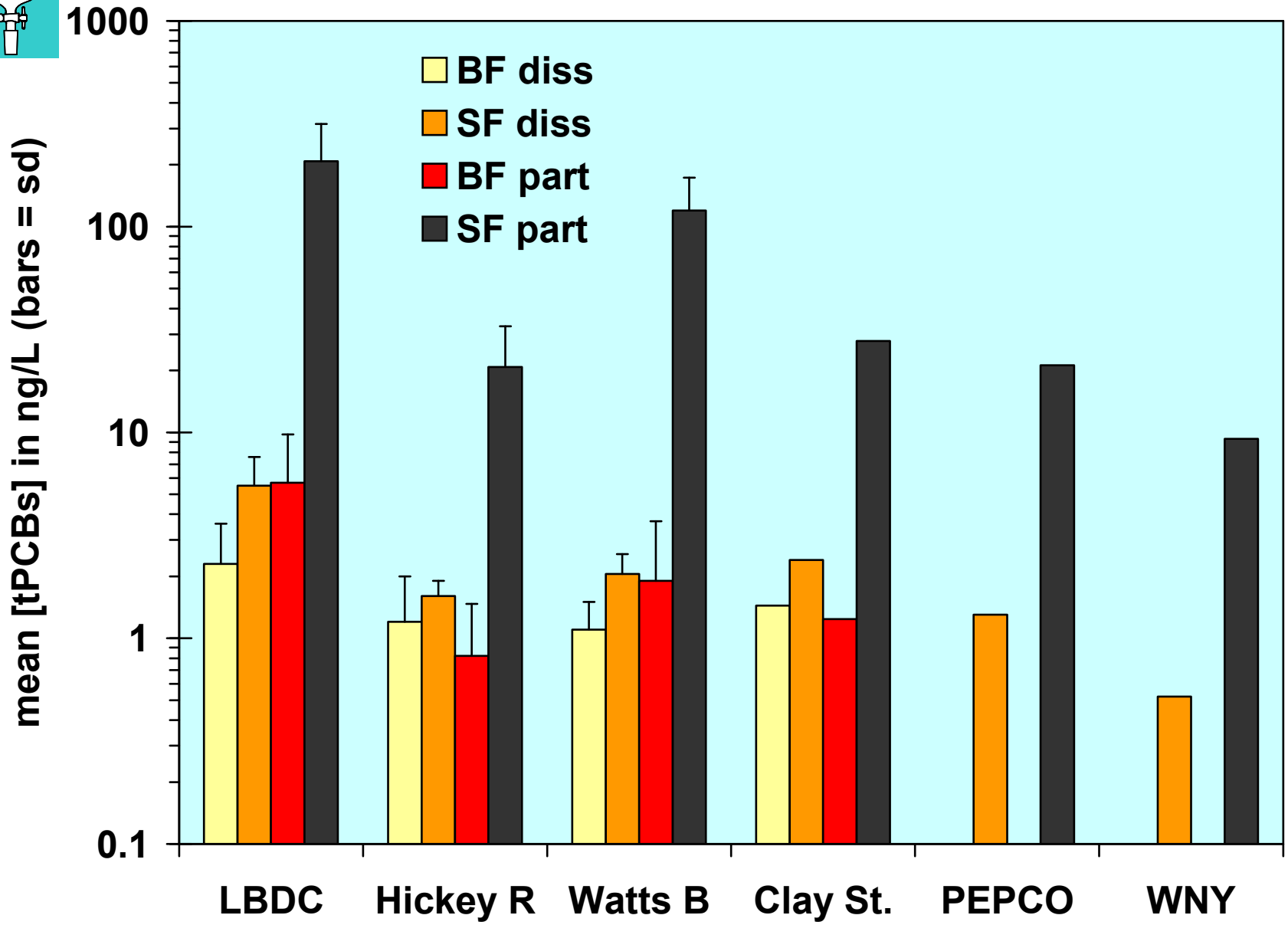
Hickey Run 2002



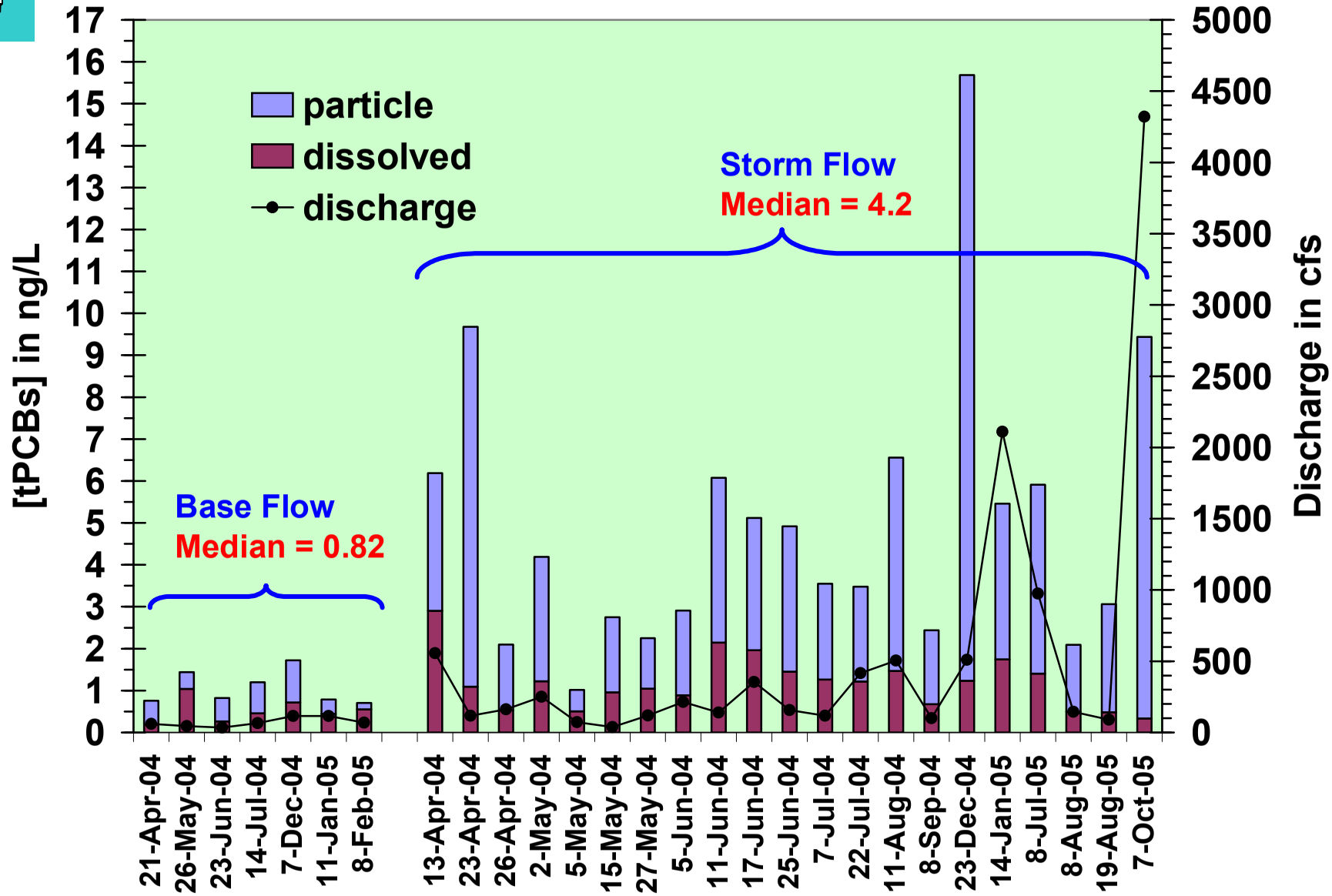
Watts Branch 2002



Mean [tPCB] in Minor Tribs and CSOs

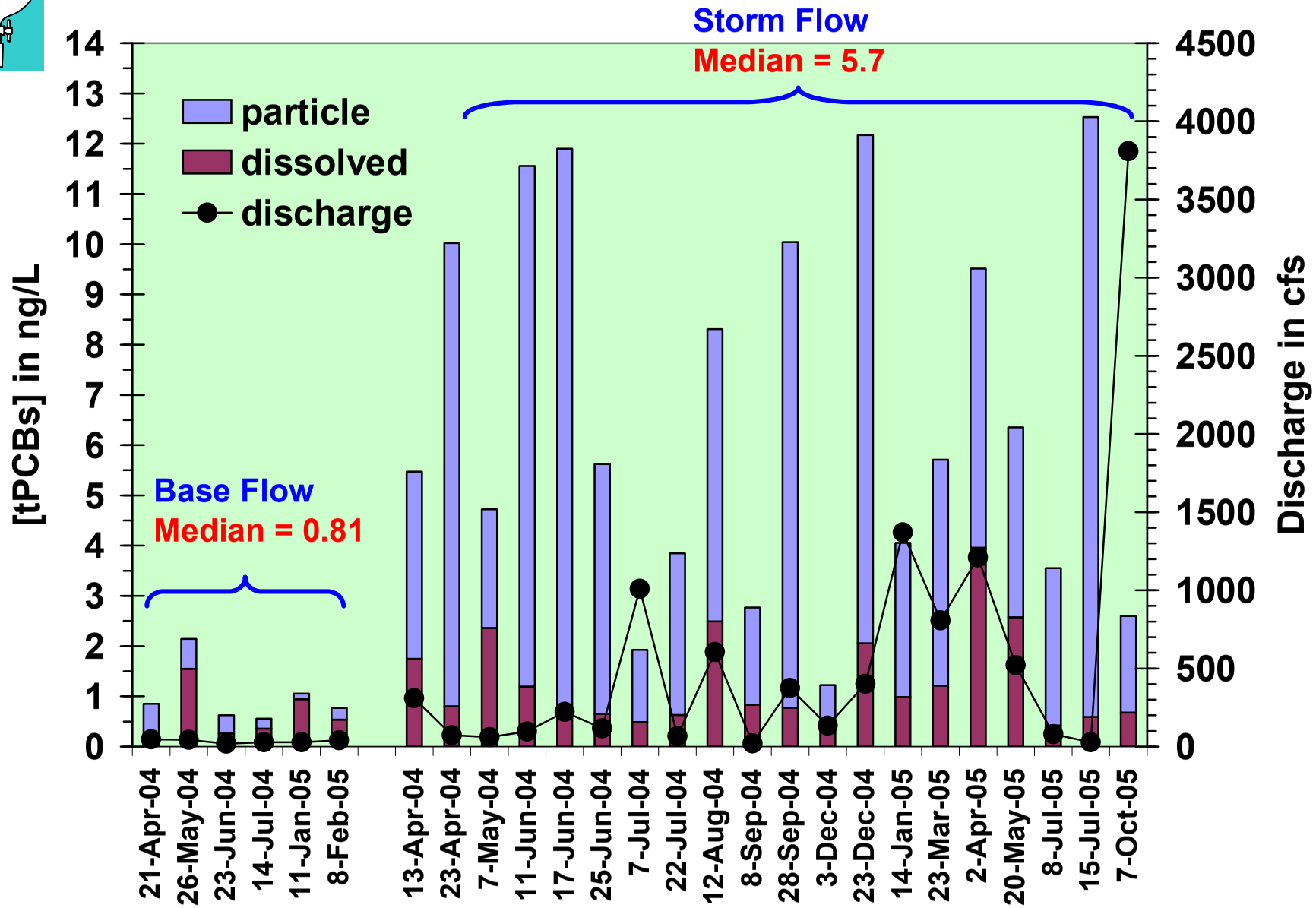


Anacostia R, NE Br 2004/2005

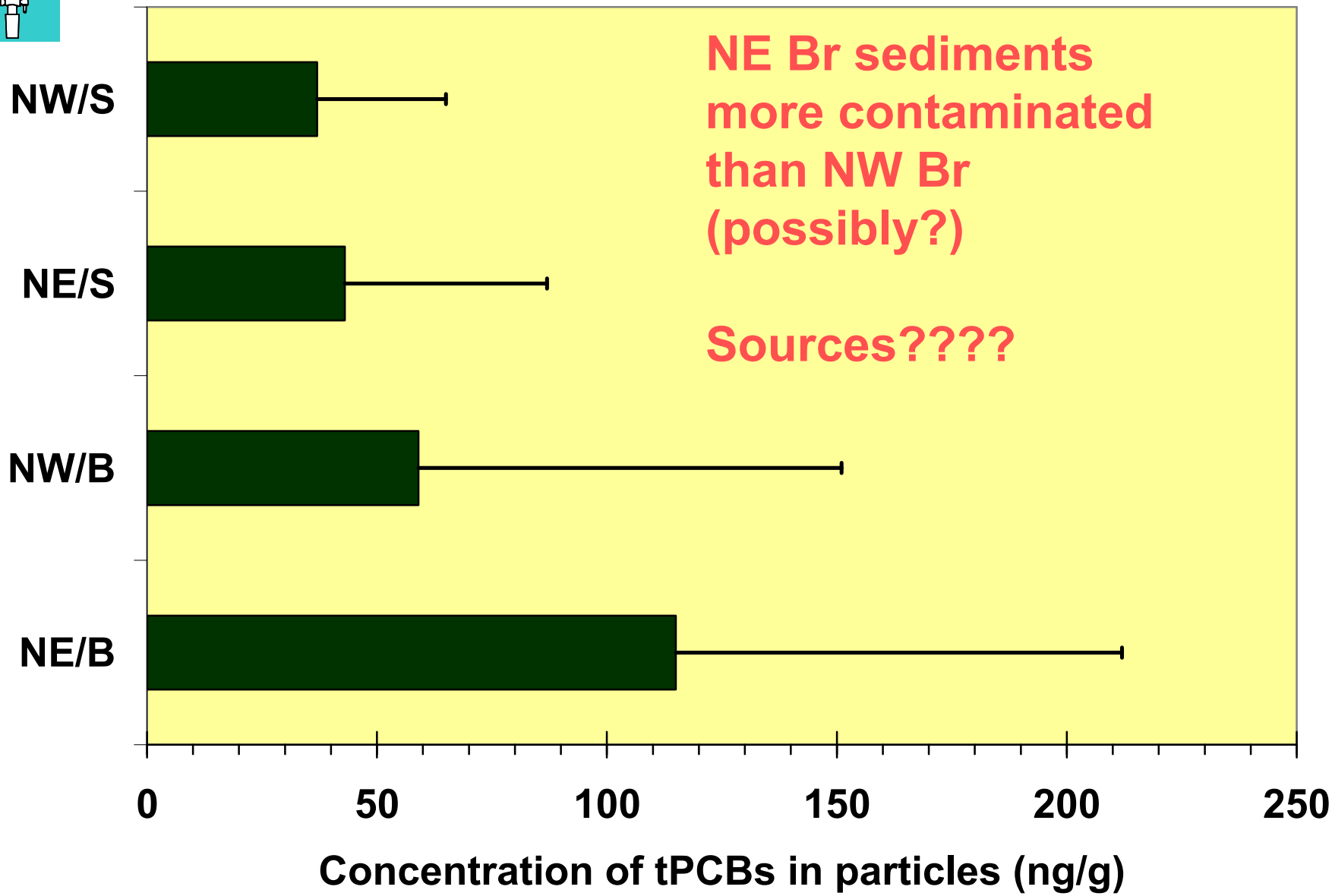


Chemistry & Biochemistry

Anacostia R, NW Br 2004/2005



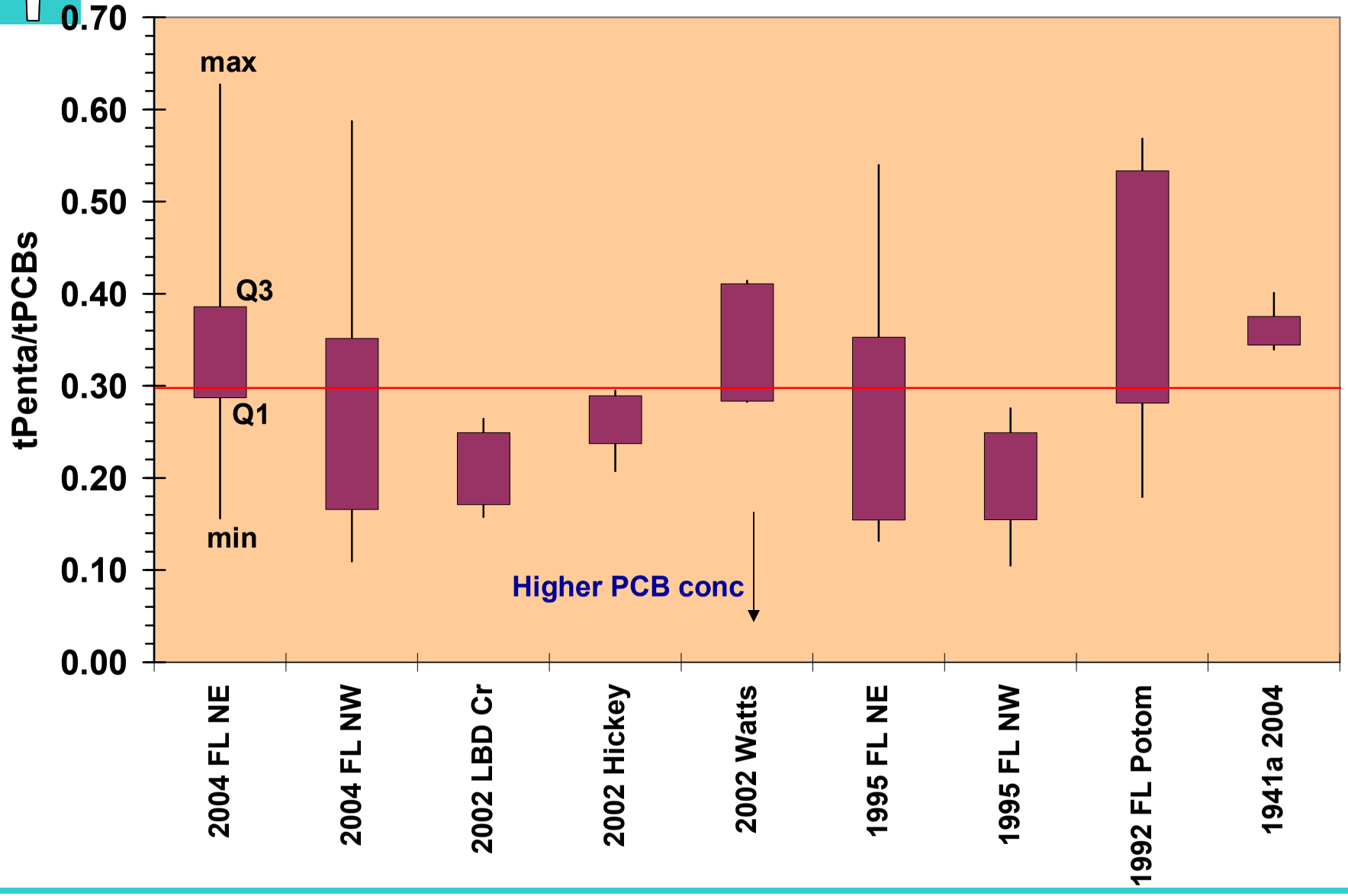
[tPCBs] in AR Particles (ng/g) 2004



NE Br sediments more contaminated than NW Br (possibly?)

Sources????

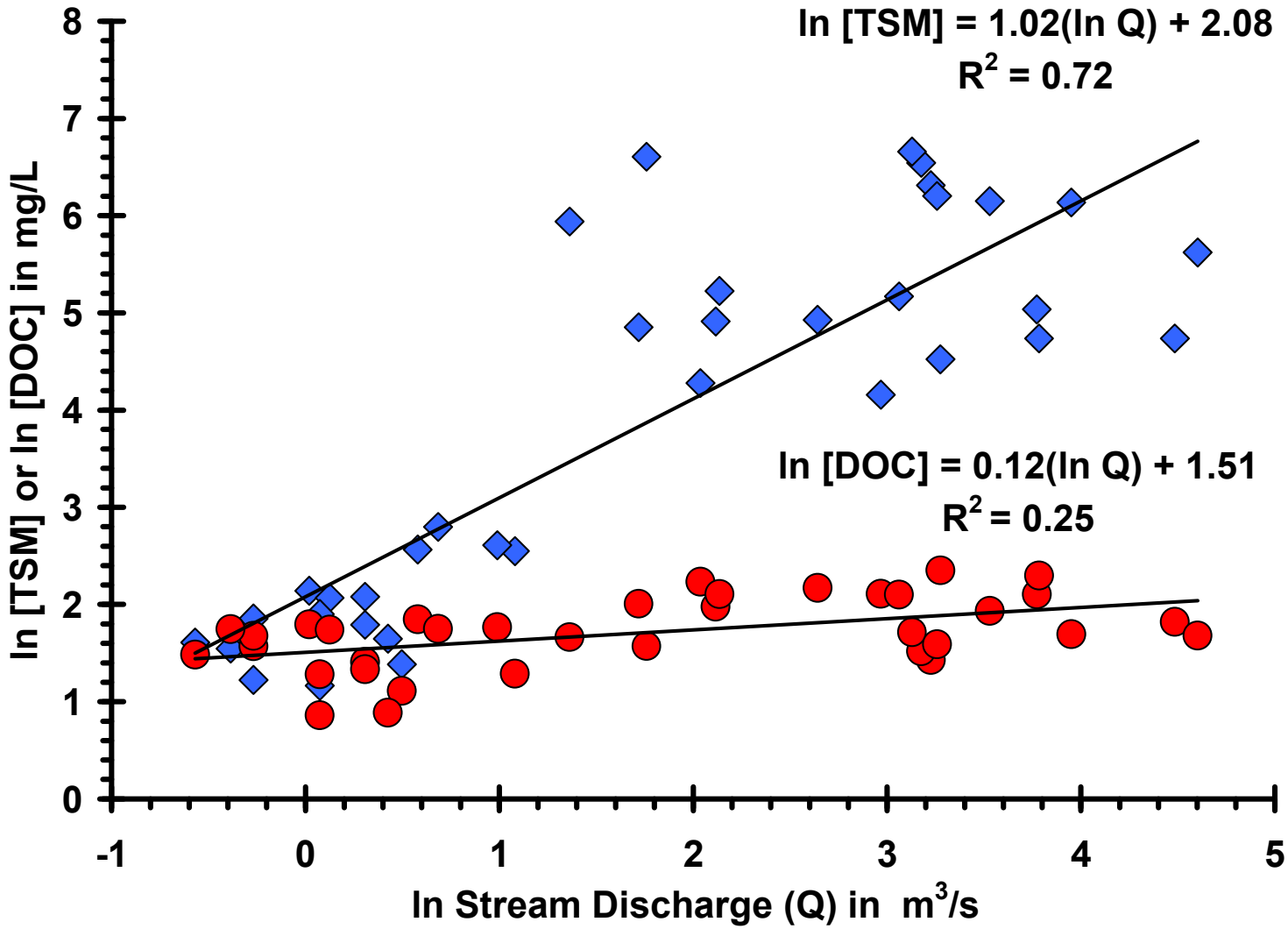
tPenta to tPCB Ratios



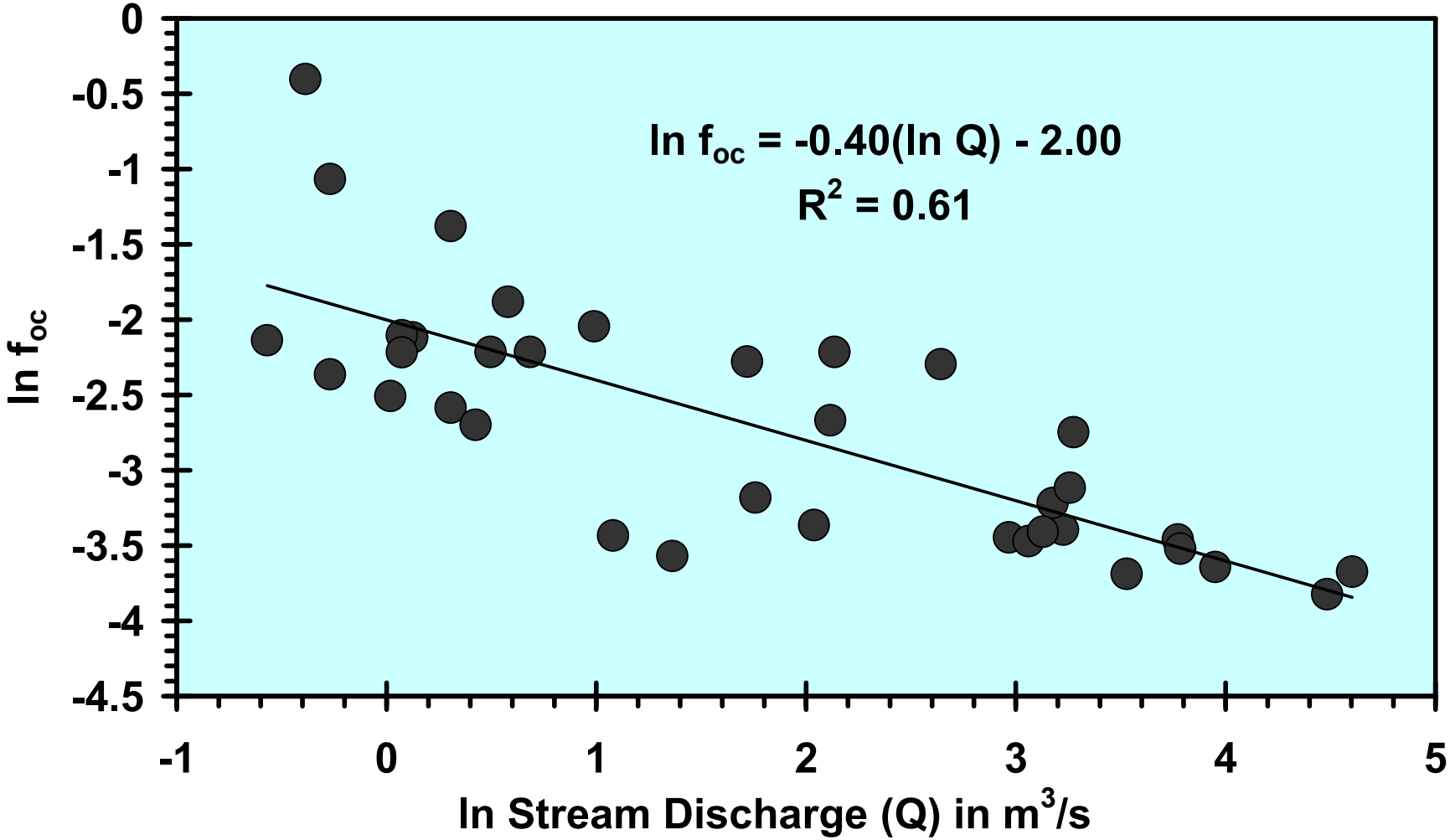
Contaminant Hydrology

- Mathematical relations between [PCBs] and sediment, river discharge, etc.
- Need to have (simple) predictive models that correlate hydrologic variables with PCB concentrations in transport

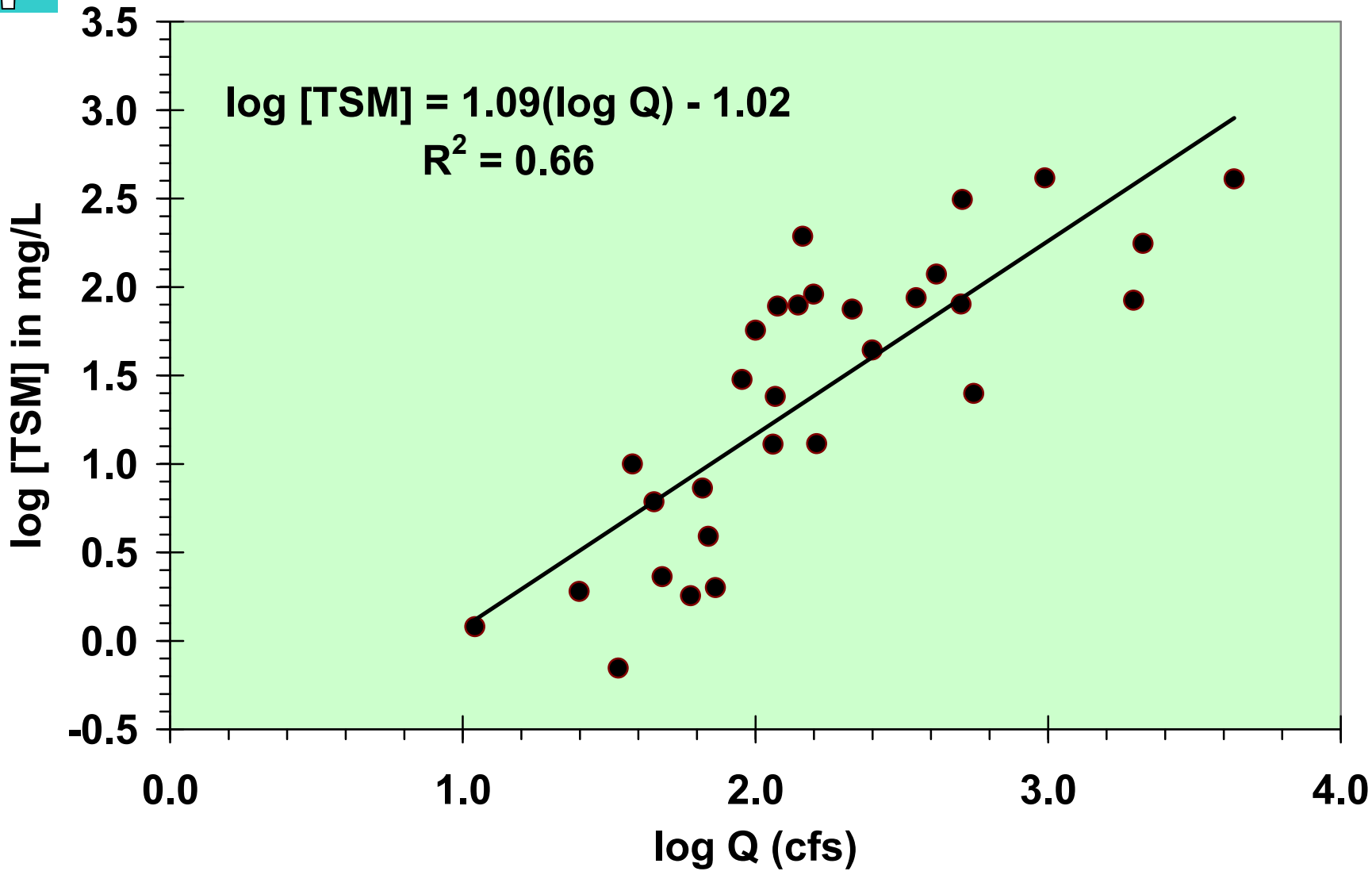
TSM v. Q in Anacostia R 1995/1996



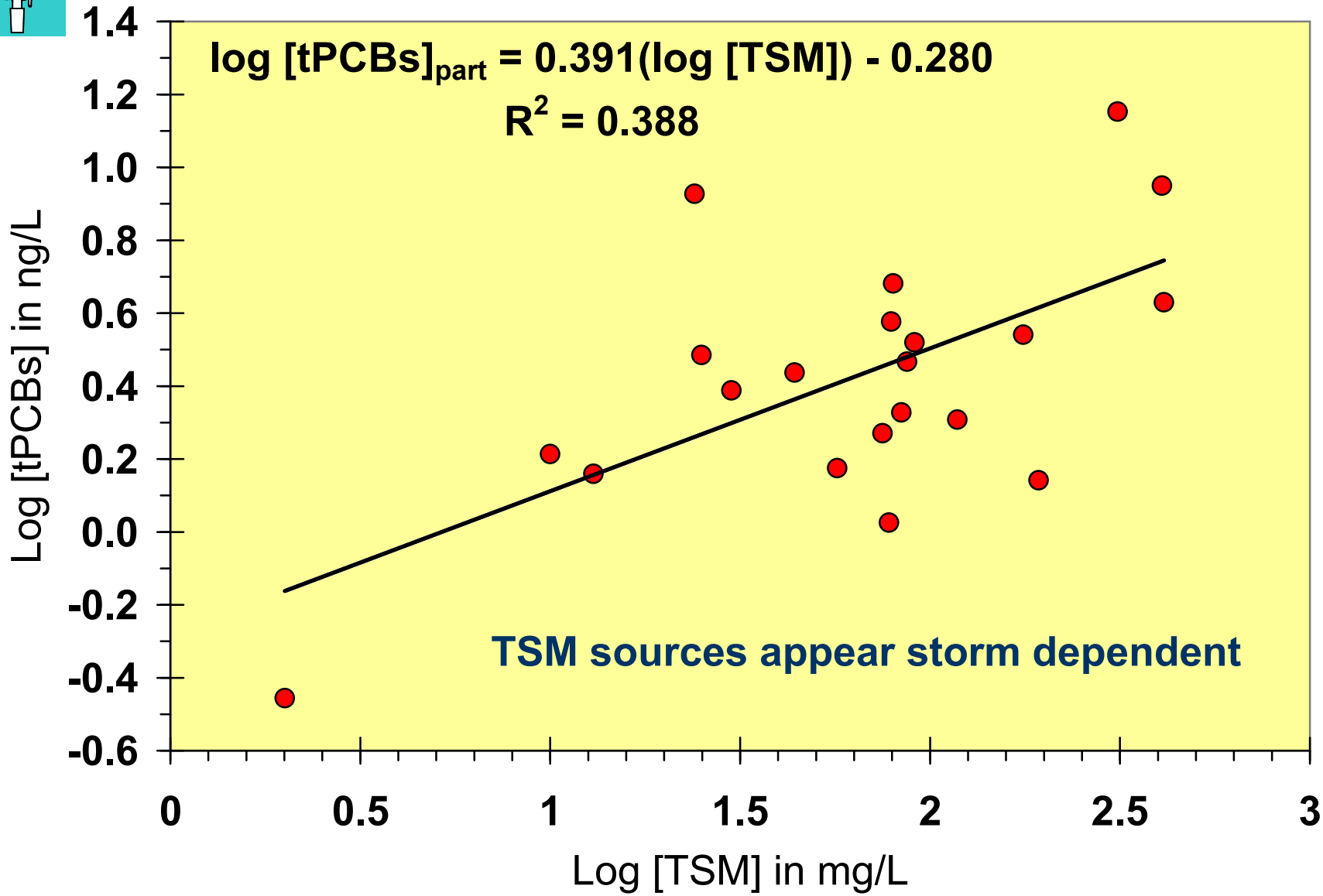
f_{oc} v. Q in Anacoatia R 1995/1996



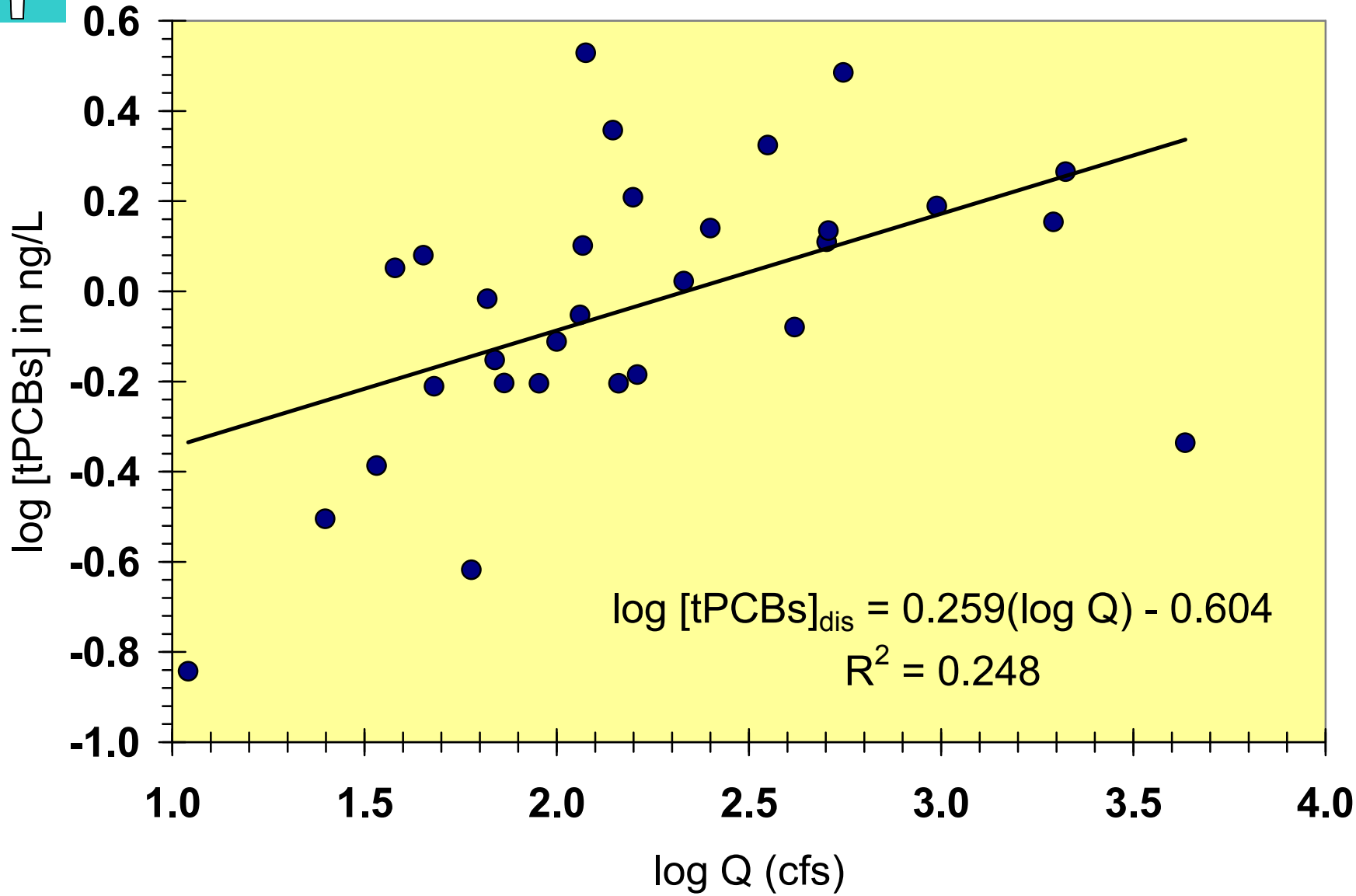
Total Suspended Matter (TSM) v. Discharge in NE 2004



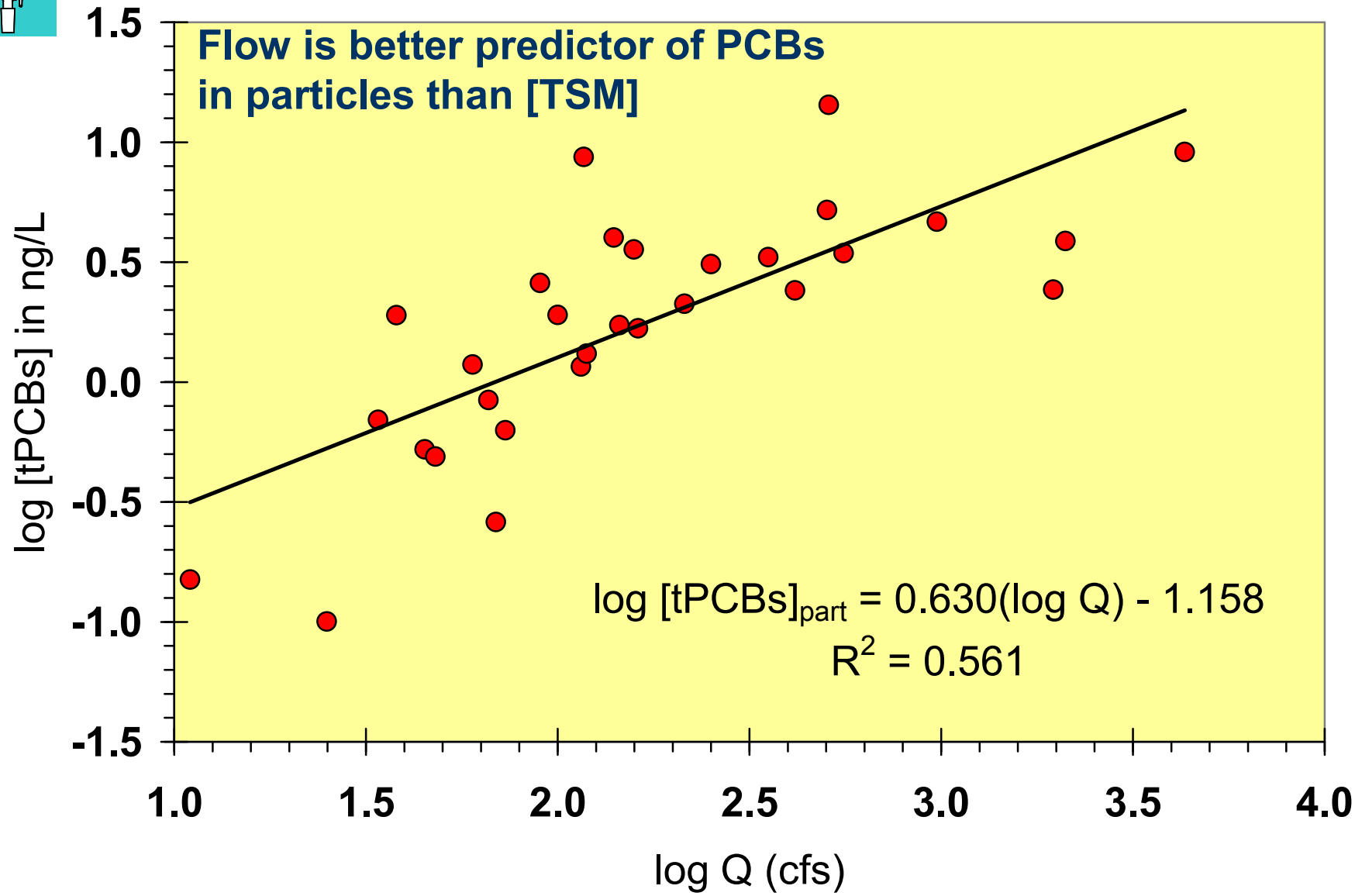
PCBs in particles v. TSM for NE Branch 2004



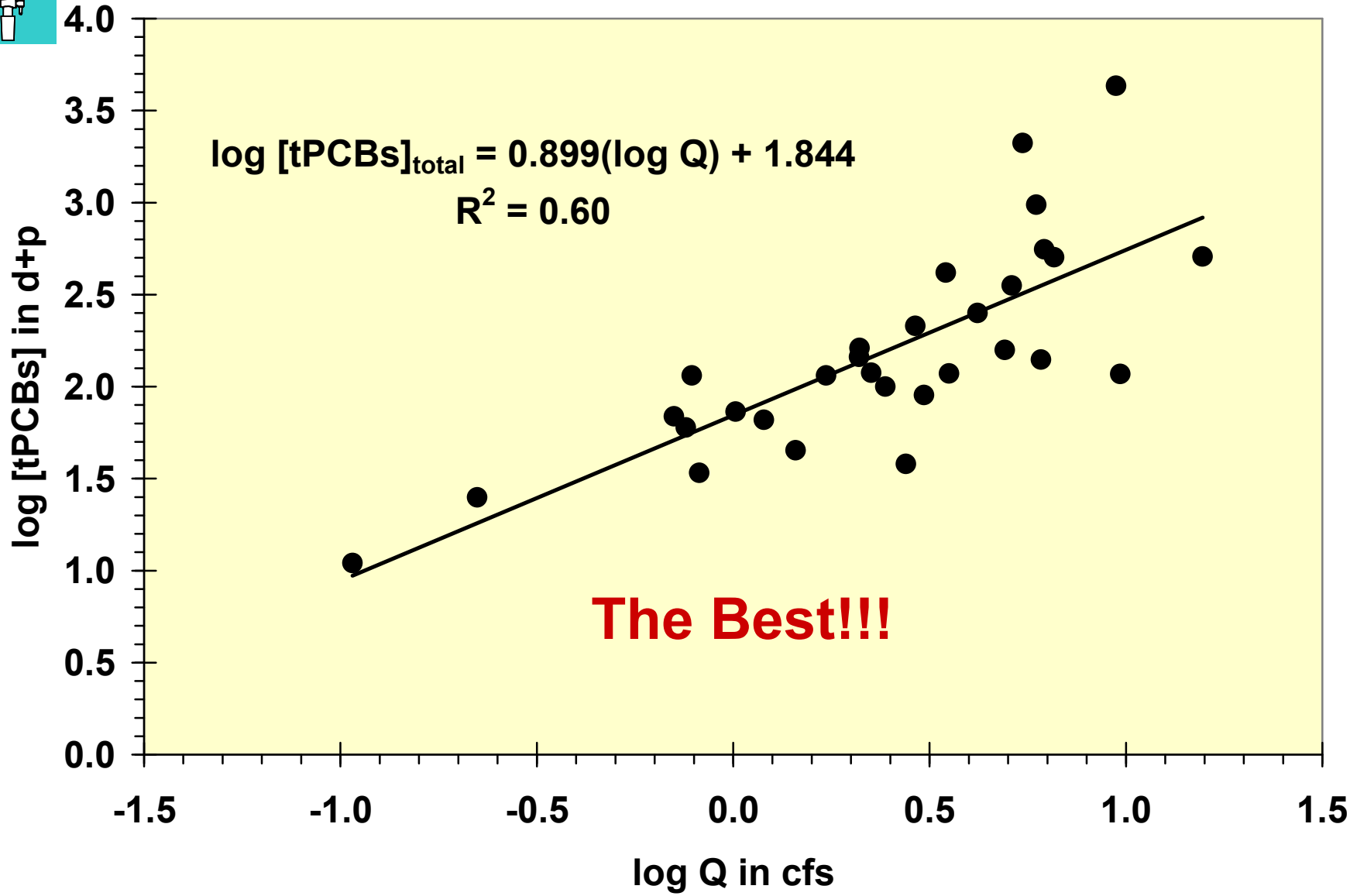
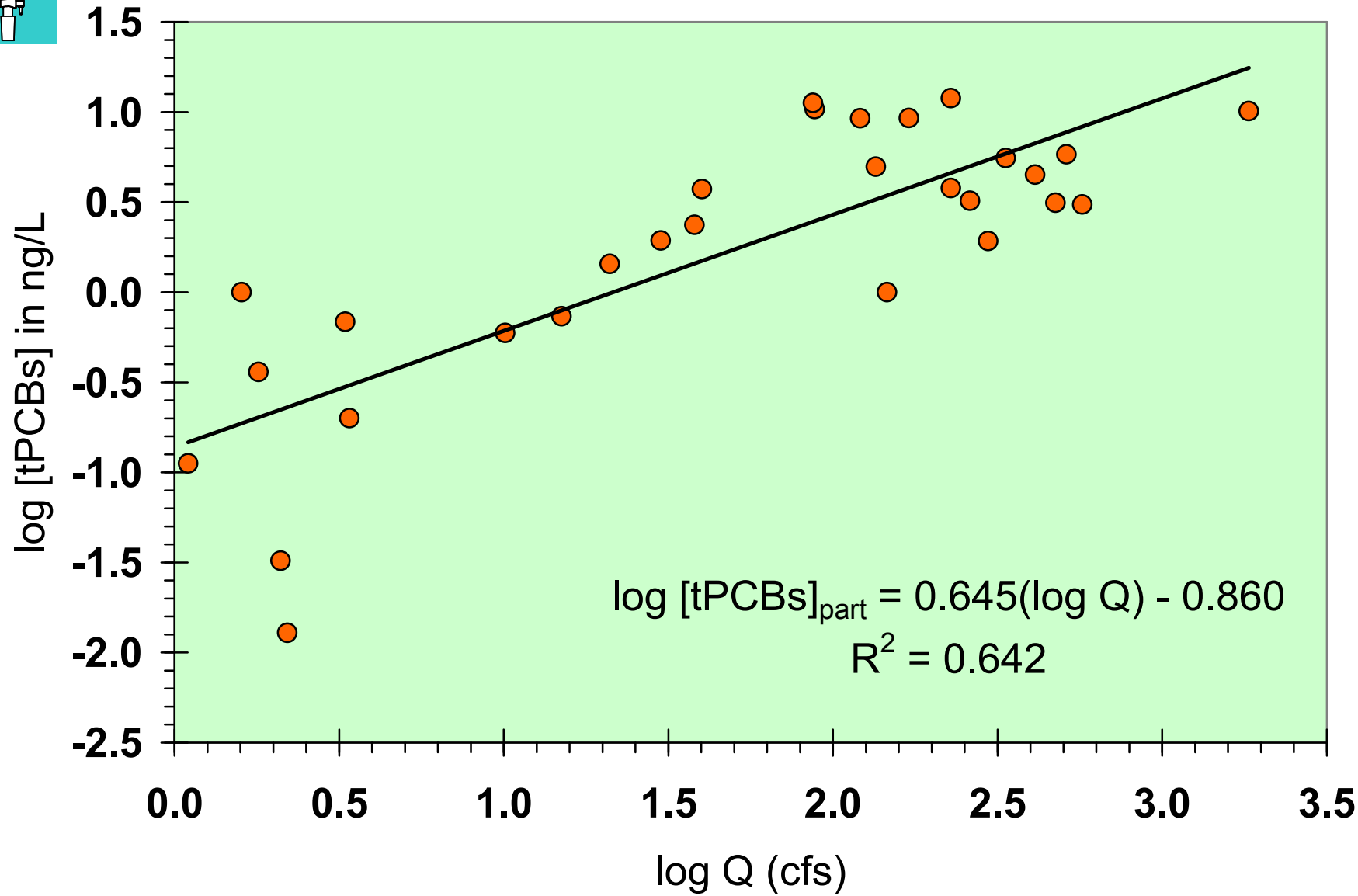
tPCBs in dissolved phase in NE 2004



[tPCBs] in Particles v. Discharge in NE 2004



[tPCBs] in d+p v. Discharge (Q) in NE 2004



[tPCBs] in Particles v. Discharge in NW 2004