Use of the PCB Aroclor Data in the RI

ANCHOR QEA

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PCB Aroclor Data: USEPA Comments

- Comments on Background, Sediments presentations
  - *Using only the congener data limits the available data to only the four reference areas. Additionally, use of only congener data in Newtown Creek does not provide adequate spatial coverage of the Creek since about 75 percent of the Phase 1 samples were analyzed for Aroclors only. This represents a gap in the total PCB data for the RI for both the background locations and Newtown Creek. An approach to address this data gap needs to be presented and discussed.*
  - *Anchor has previously indicated that the Phase 1 Aroclor data are considered to be biased vs. the Phase 1 congener data[1], and, as a result, Aroclor analysis was discontinued in Phase 2. Explain the impacts on the RI of evaluating the two data sets separately, including the impact of using potentially biased Aroclor data in the RI to define the distribution and concentrations of PCBs in sediment. Also, please indicate whether the Aroclor data will be adjusted in any way or used without modification.*

[1] Based on paired Aroclor and congener analyses showing Aroclor values consistently lower than congener values

Use of Sediment PCB Data

- RI: risk assessment
  - Study Area-wide averages
    - BHHRA flooding scenario
    - BERA wildlife incidental exposure
  - Nearshore averages
    - BERA wildlife exposure
- RI: comparison with background

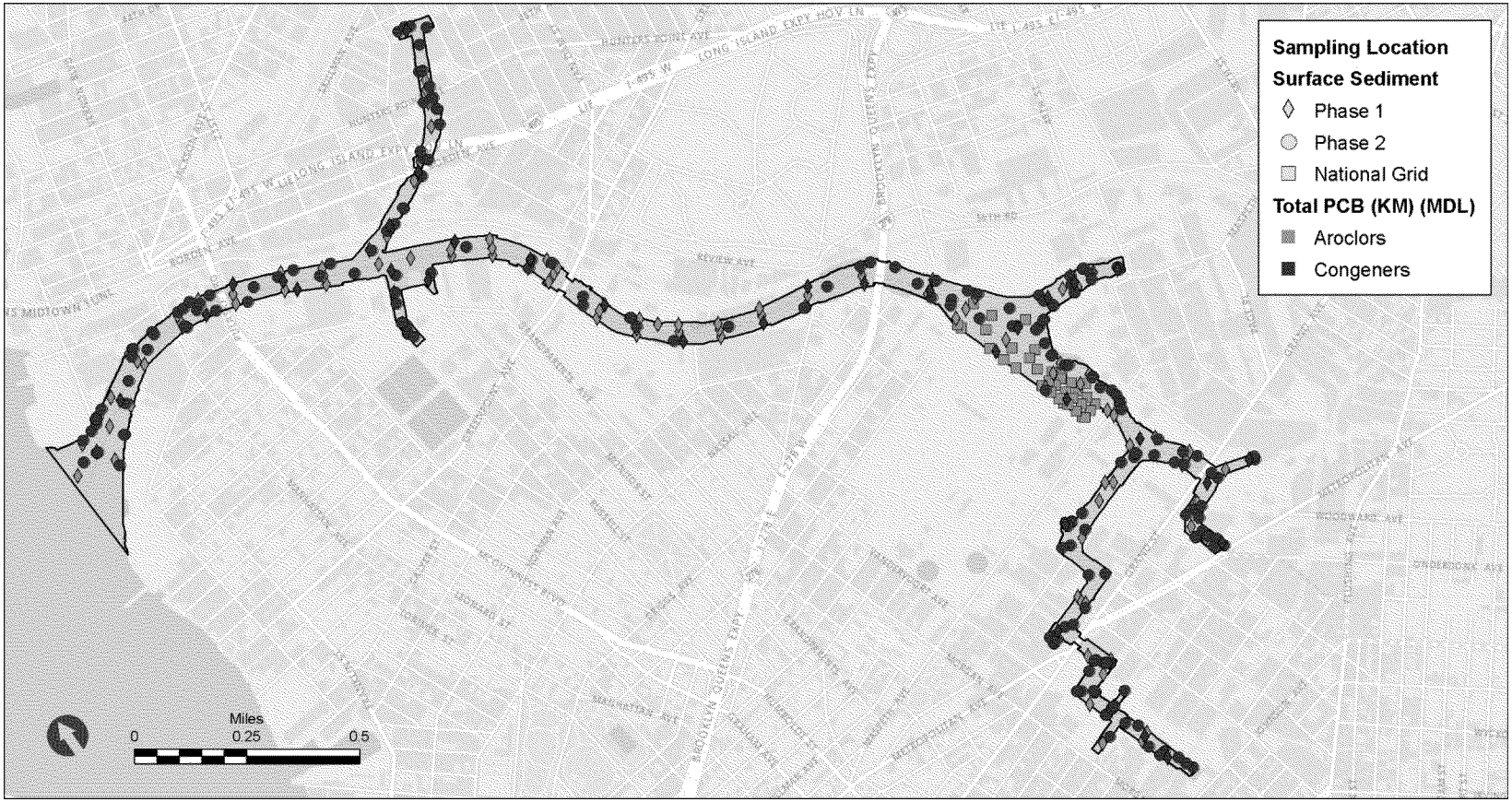
Use of Sediment PCB Data

- RI: nature and extent
  - Spatial patterns (qualitative)
  - Averages (e.g., SWAC, arithmetic average)
  - Surface and subsurface
- RI, FS: modeling
  - Initial conditions in surface and subsurface
  - Integrate with point source, surface water, porewater data
- FS: remedy considerations
  - Averages, surface and subsurface
  - Depth of contamination, or similar metric

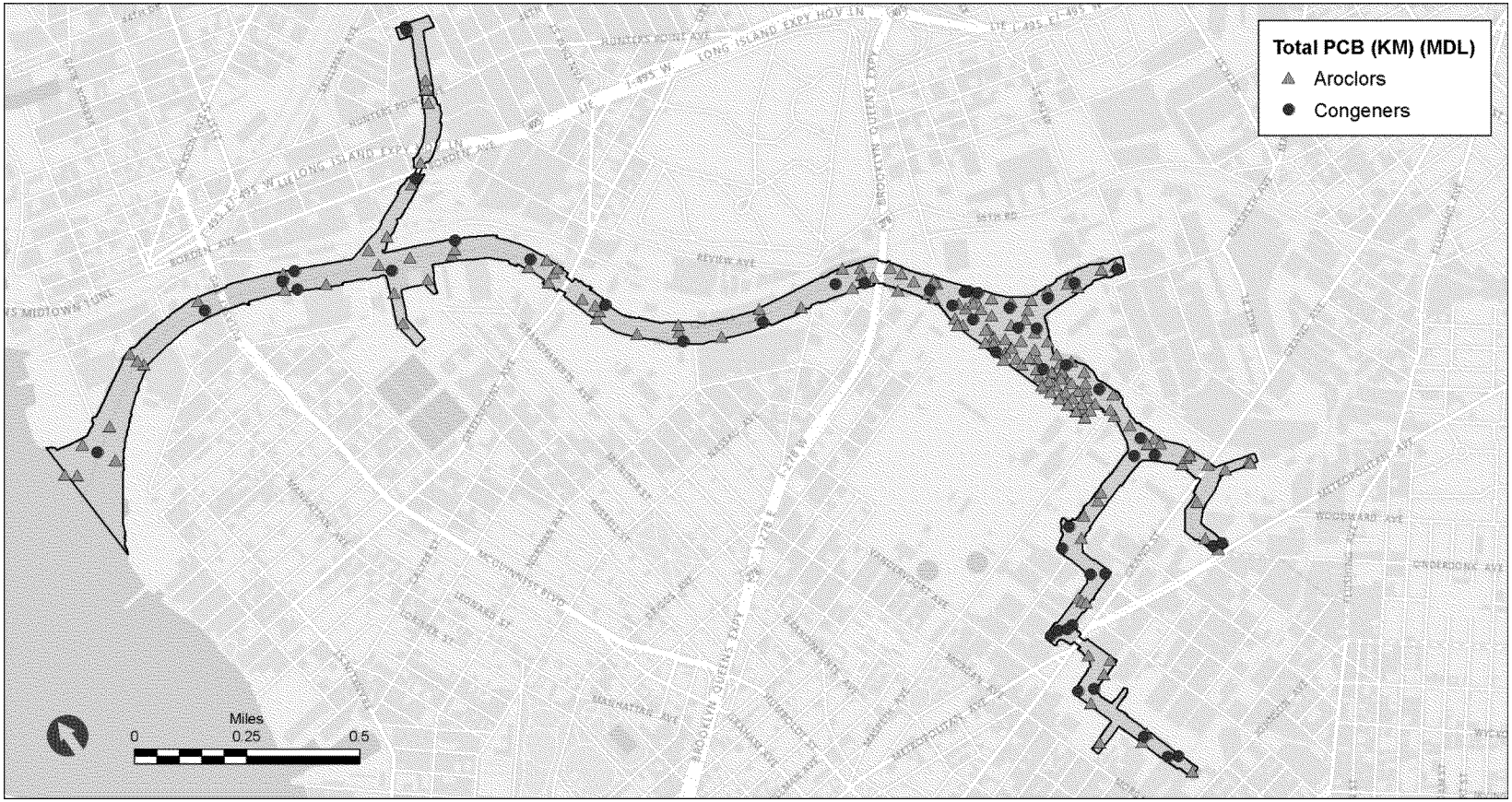
Sediment PCB Datasets

- Congener
  - Phase 1
  - Phase 2
- Aroclor
  - Phase 1
  - National Grid

Surface Sediment Sample Locations



Subsurface Sediment Sample Locations



Note:
Map shows only complete cores (i.e., cores with samples throughout the sediment column down to native material).

Approach

- Risk assessment
  - Use Phase 1 and Phase 2 congener data
  - This is the dataset used in the BHHRA and BERA that have been submitted to USEPA
- All other uses
  - Combine congener and Aroclor data to create one dataset
  - Adjust TPCB Aroclor data to match the TPCB congener data

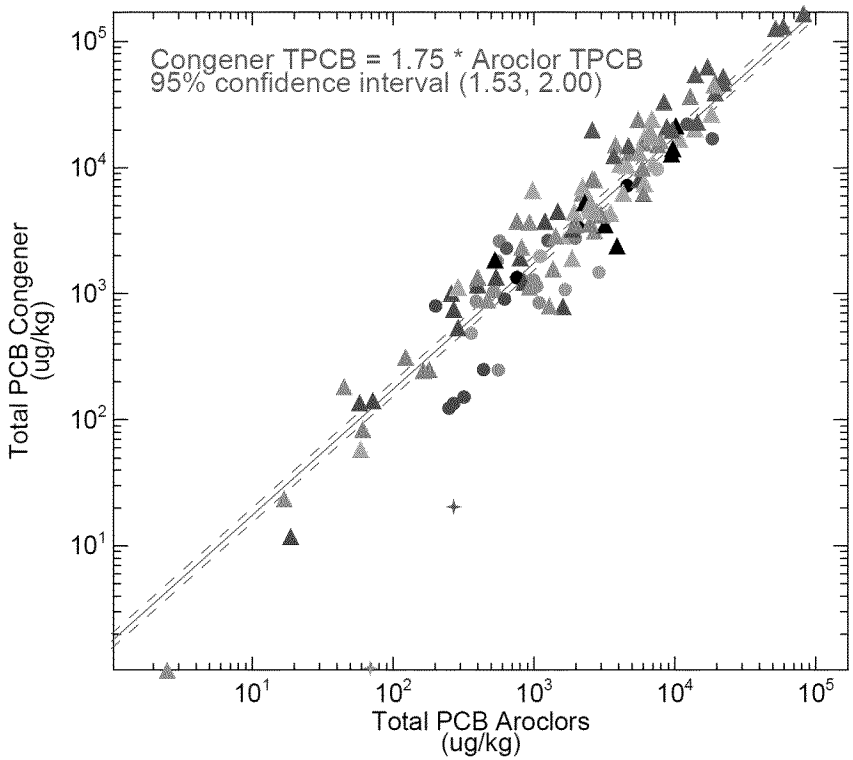
Relationship Between Aroclor and Congener TPCB: Matched Samples

- Relationship consistent over 3 orders of magnitude
- Relationship consistent throughout the Study Area
- Relationship summarized as average ratio

Model: $\frac{\square}{\square} = \square$

- $\square = 1.75$ 95% CI: $[1.53, 2.00]$

Note:
This presentation depicts the data on a log-log plot. Confidence intervals are based on t-distribution.



Note:
Non-detects removed from dataset for estimation of correlation

- Surface
- Subsurface
- Native

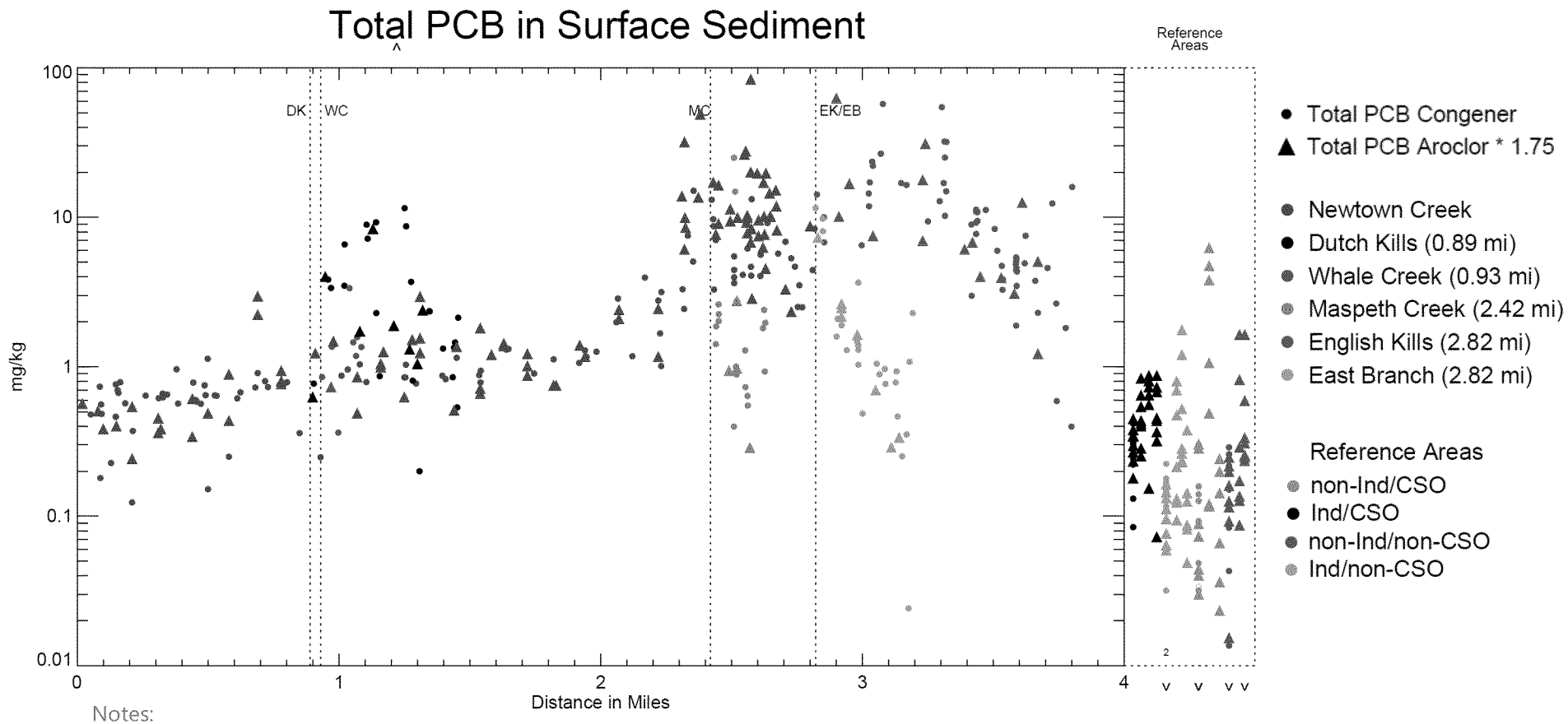
- Newtown Creek: Seg. 1
- Newtown Creek: Seg. 2
- Turning Basin
- Dutch Kills (0.89 mi)
- Whale Creek (0.93mi)
- Maspeth Creek (2.42 mi)
- English Kills (2.82 mi)
- East Branch (2.82 mi)

Use of the National Grid Aroclor Data

- No matched congener data
- National Grid, Phase 1 Aroclor data measured by same laboratory
  - No substantive changes in procedures between the National Grid and Phase 1 programs
  - Supports use of National Grid Aroclor data in combined dataset with Phase 1 Aroclor data

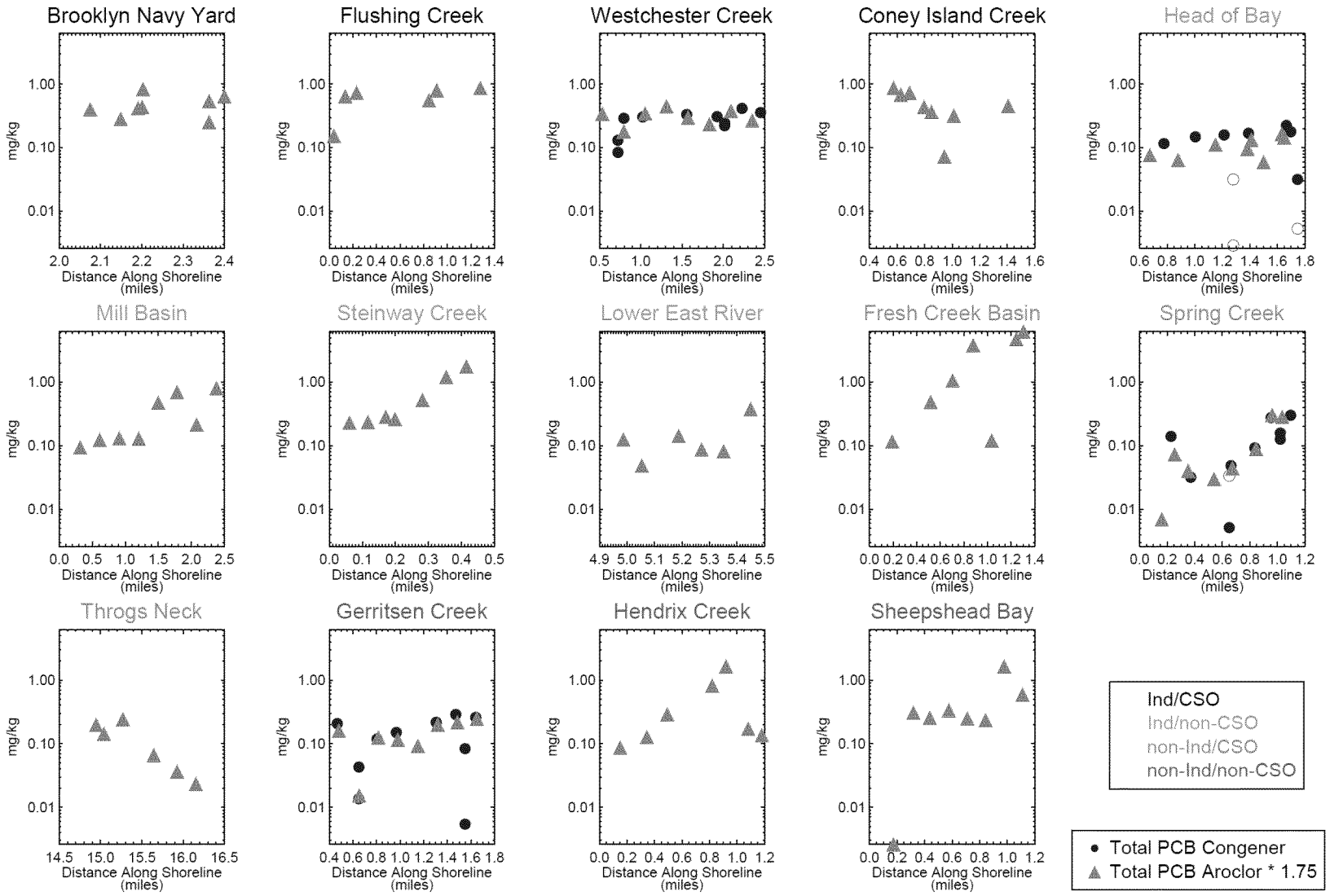
PCB Method	Dataset	Laboratory Name	Laboratory Code	Analytical Method	Congener Peaks Resolved (Coeluting)
Congener	RI Phase 1	SGS Environmental Services, NC (Location 1) SGS Environmental Services, NC (Location 2)	SGS_NC	E1668B	166 (32) 173 (26)
	RI Phase 2	SGS Environmental Services, NC	SGS_NC	E1668A	173 (26)
Aroclor	RI	Test America Pittsburgh, PA	TAPIT	SW8082A	---
	National Grid	Test America Pittsburgh, PA	TAPIT	SW8082	

Surface Sediment Combined Aroclor+Congener Total PCBs

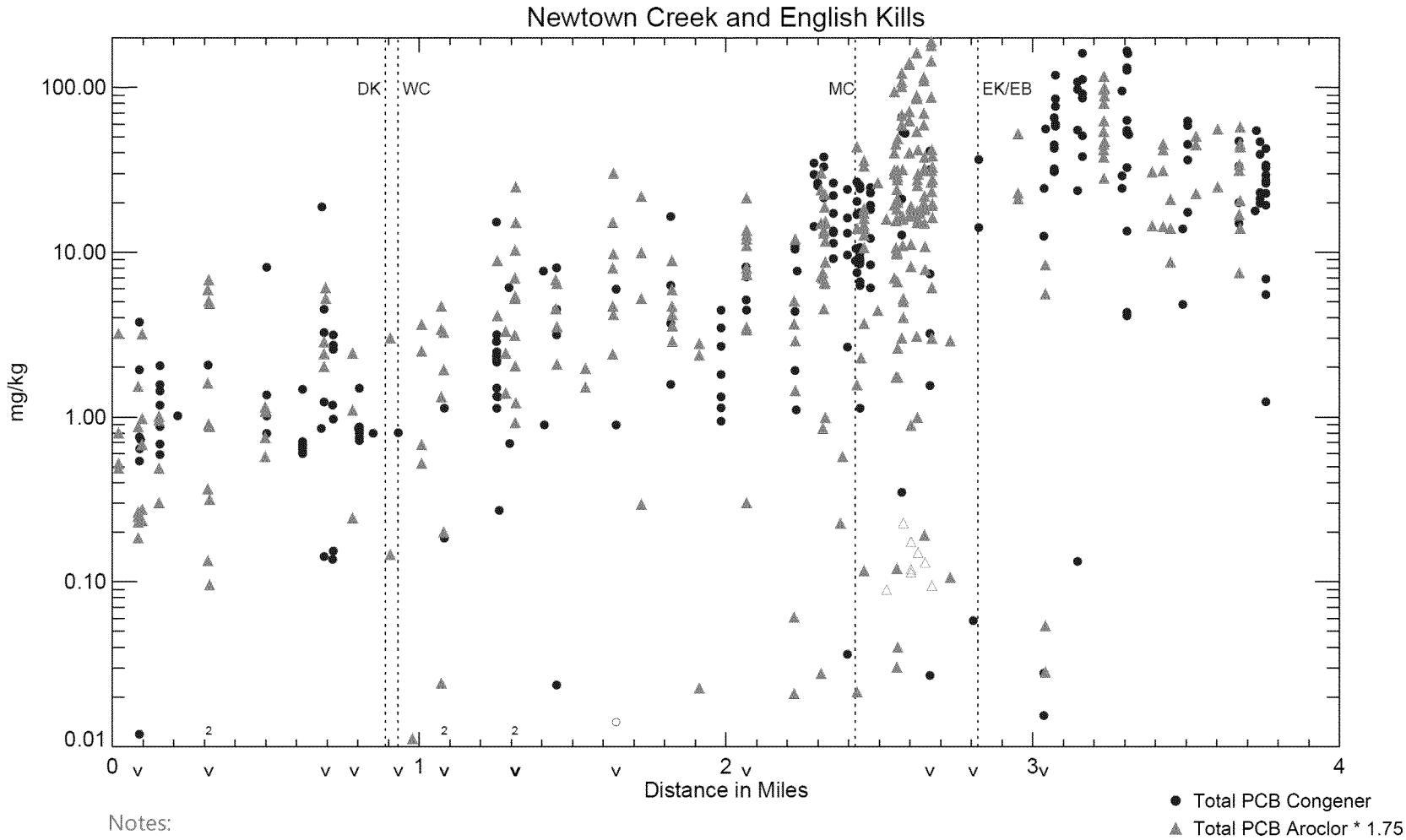


Notes:
Aroclor values multiplied by 1.75.
Locations with Aroclor and congener data only show congener result. Plot includes Phase 1, Phase 2, and National Grid.
Carets below and above the panel indicate values off scale (where more than one value, number of values indicated).

Reference Area Surface Sediment Total PCBs

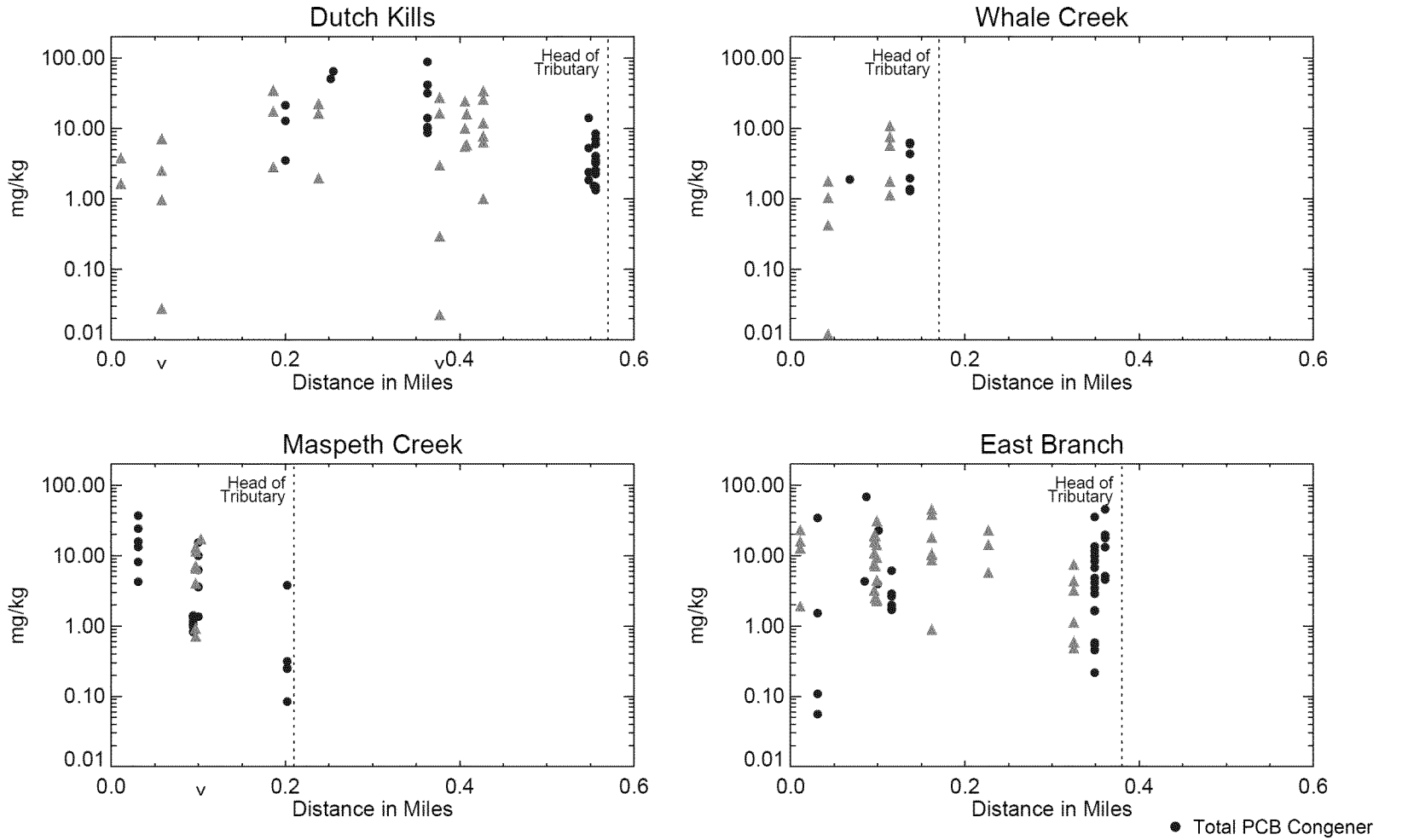


Subsurface Sediment Combined Total PCBs



Notes:
Aroclor values multiplied by 1.75. Locations with Aroclor and congener data only show congener result.
Plot includes data from all subsurface programs: Phase 1, Phase 2, and National Grid. Excludes native samples.
Caret symbols and numbers above or below the panel indicate the number of values that are outside of the y-axis range.

Subsurface Sediment Combined Total PCBs



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Conclusion: Recommendation

- Risk assessment: use Phase 1 and Phase 2 congener data
- All other uses: combine congener and Aroclor data to create one dataset
  - Adjust TPCB Aroclor data (Phase 1 and National Grid) to match the TPCB congener data

Questions/Discussion