Evaluation of Polychlorinated Biphenyl Congeners in Surface Waters from the Green River and its Major Tributaries

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King County

Study Questions

- How do relative contributions of PCB congeners, PAHs and Arsenic differ between baseflow and storm conditions in the Green River basin?

- What are the relative spatial differences in PCB congeners, PAHs and Arsenic concentrations in the Green River and its major tributaries?

Presentation will only cover PCBs

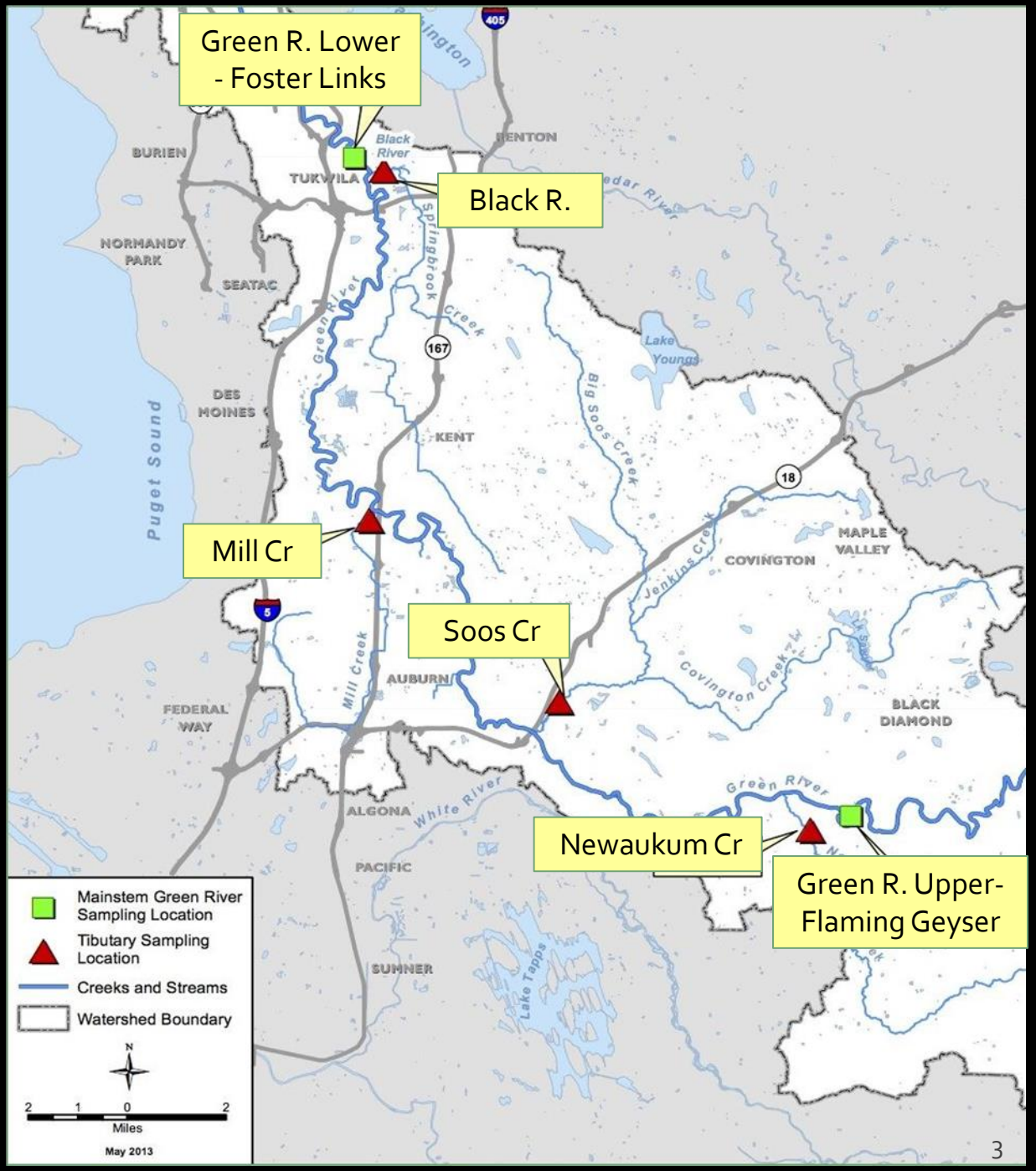
Study Area and Sampling Locations

Mainstem Green River

- Flaming Geyser SP
- Foster Links Golf Course

Tributaries

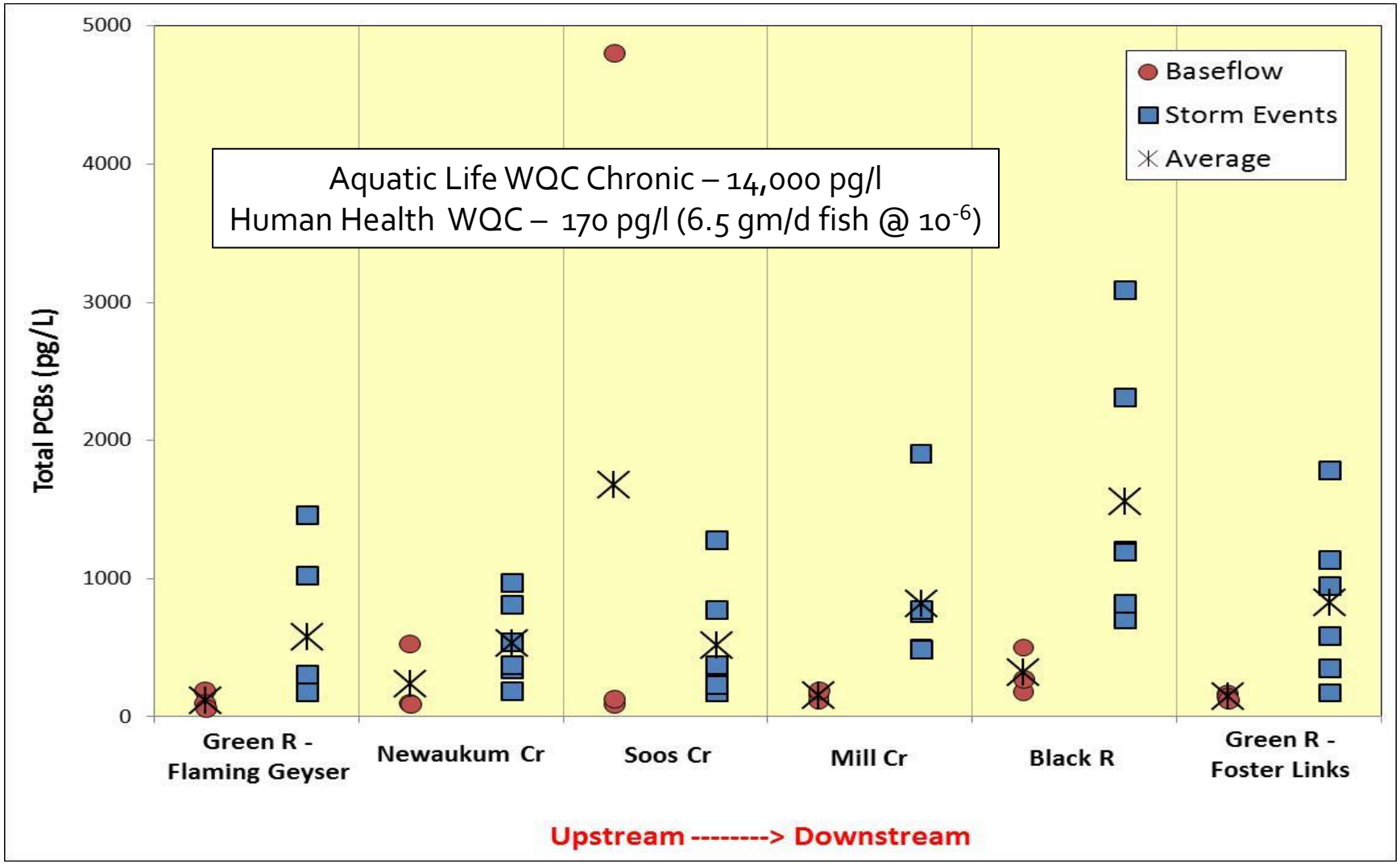
- Soos Creek
- Newaukum Creek
- Mill Creek
- Black River Pump St.**



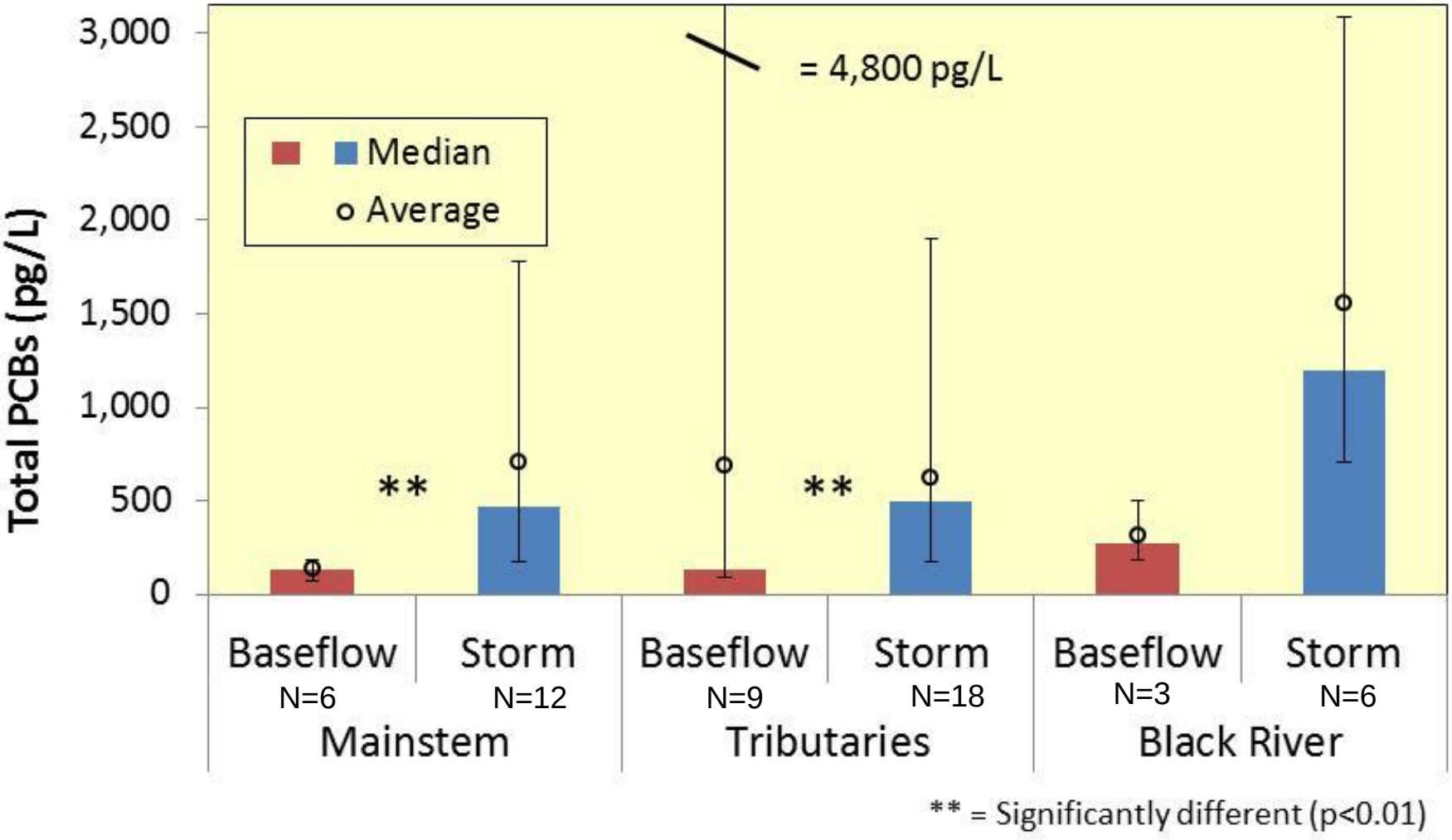
Sampling Methods

- **Sampling Events**
  - Baseflow - n= 3 (2011); min. 3-day antecedent dry period
    - 24-hr time-wt composites
  - Storm Event - n=6 (2011 – 2012); forecast ≥0.25" event
    - 3 Tributaries: 12-24 hr flow-wt composites
    - Green R. Mainstem and Black R. Pump Station: 24 hr time-wt composite
- **Collection Methods**
  - Composites -ISCO® auto-samplers
- **Analysis**
  - 209 PCB congeners by AXYS Analytical

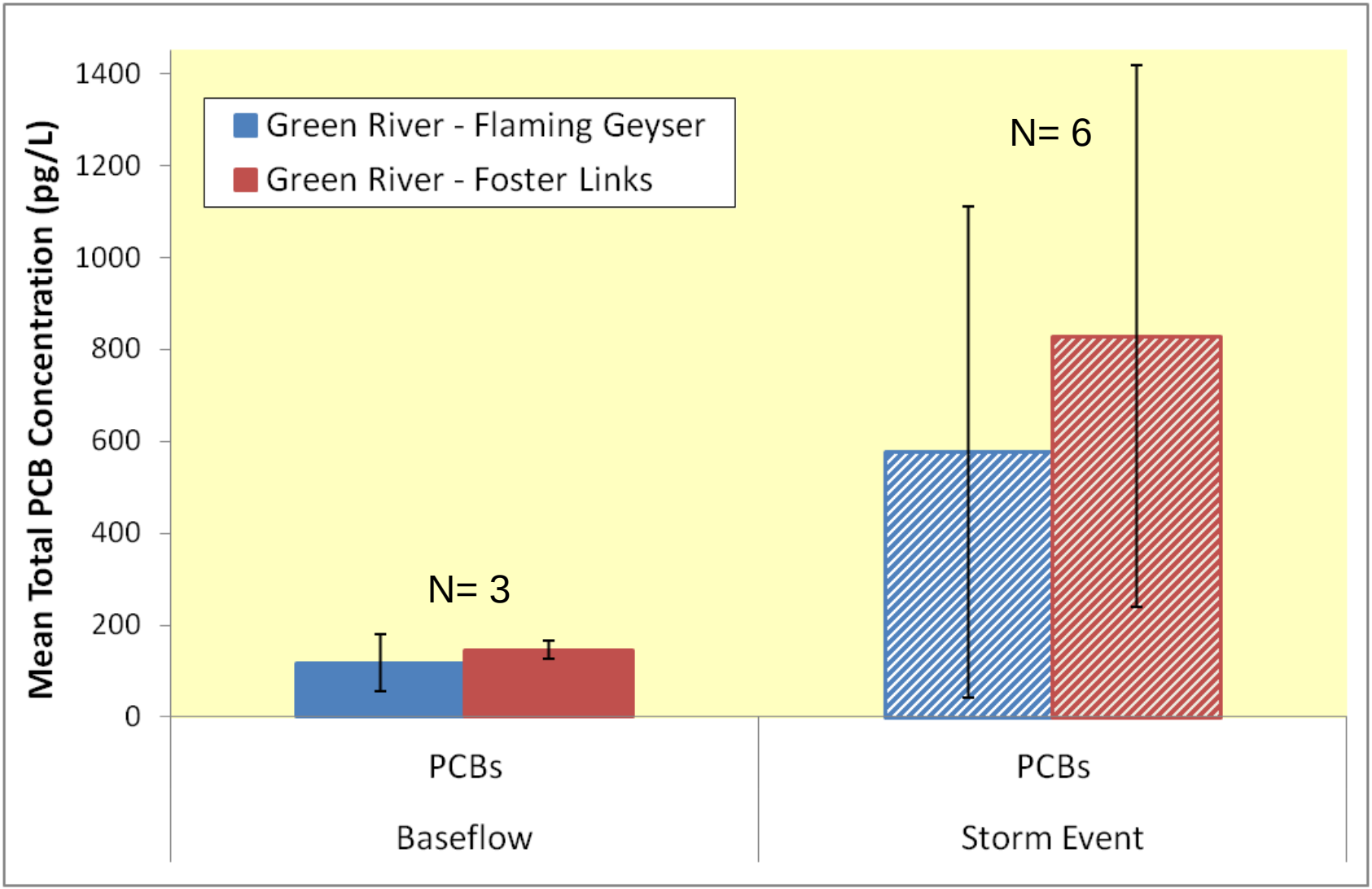
Results: Total PCBs



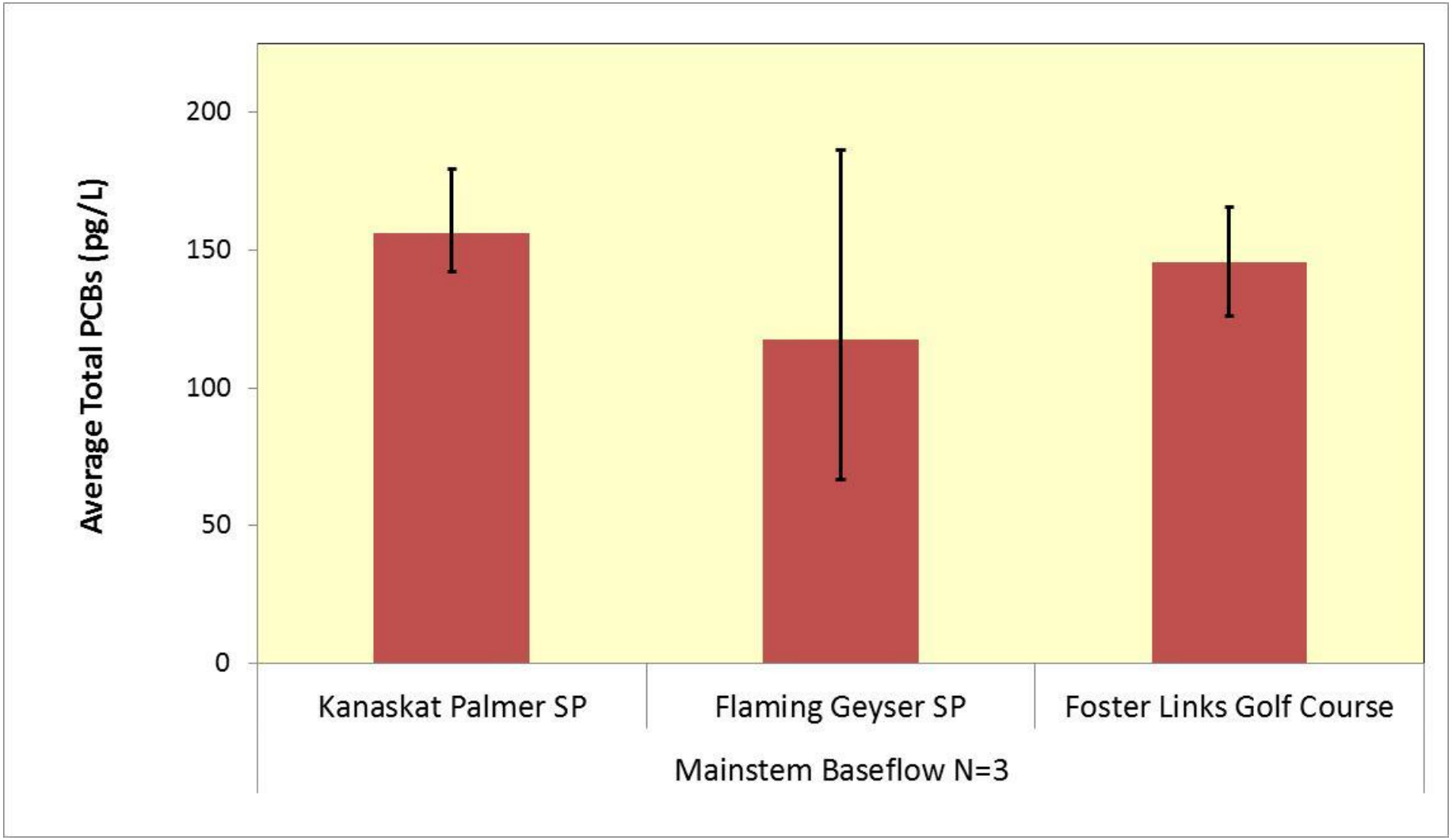
Results:
All Sites - Base flow vs. Storm Event



Results:
Mainstem - Upstream vs. Downstream



Results: Mainstem Baseflow



Conclusions: Baseflow

- Mean PCB concentrations highest in Soos Cr; however, one sample (4800 pg/l) greatly influenced the mean concentration
- Excluding the elevated Soos Cr value, baseflow concentrations ranged from 66.8 pg/l at Flaming Geyser State Park to 527 pg/l in Newaukum Cr

Conclusions: Storm Events

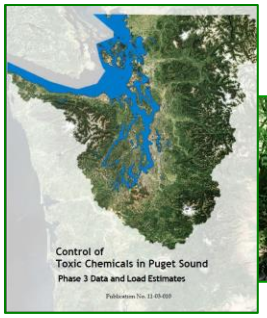
- PCBs generally higher at three most downstream locations: Mill Creek, Black River and the Green River Foster Links location
- Highest concentrations detected at Black River Pump Station
- Differences between sampling locations not significantly different

Conclusions: Baseflow vs. Storm

- PCB concentrations generally higher during storm events than baseflow conditions at all sites
- Significant differences between storm and baseflow concentrations when data grouped by station type: Green River mainstem sites; tributaries (Newaukum, Soos and Mill creeks); and Black River Pump Station

Results: Comparison to other Watersheds

- Data compared to Ecology's Surface Runoff Study (Herrera 2011)
  - Collected baseflow and storm event samples in sub-basins representing different land uses in Puyallup & Snohomish basins
- On average, Green River basin PCB levels are within the range of those observed in the Puyallup and Snohomish basins



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Final Report – Search on the King County Website for "*Green River Water Surface Water Data Report*"