

# Sampling Suspended Solids in the Green River and Major Tributaries

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Science Seminar  
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# Study Objective

- **Study Objective:**
  - to make relative comparisons of PCBs, PAHs, dioxins and arsenic associated with suspended solids in the Green River and its major tributaries
  - to provide information to assist in understanding upstream sources to the Lower Duwamish Waterway

*The information collected from this effort is not intended to be a comprehensive characterization of the suspended solids in the streams and will not be sufficient to estimate total contaminant loading to the Lower Duwamish Waterway*

# Study Questions

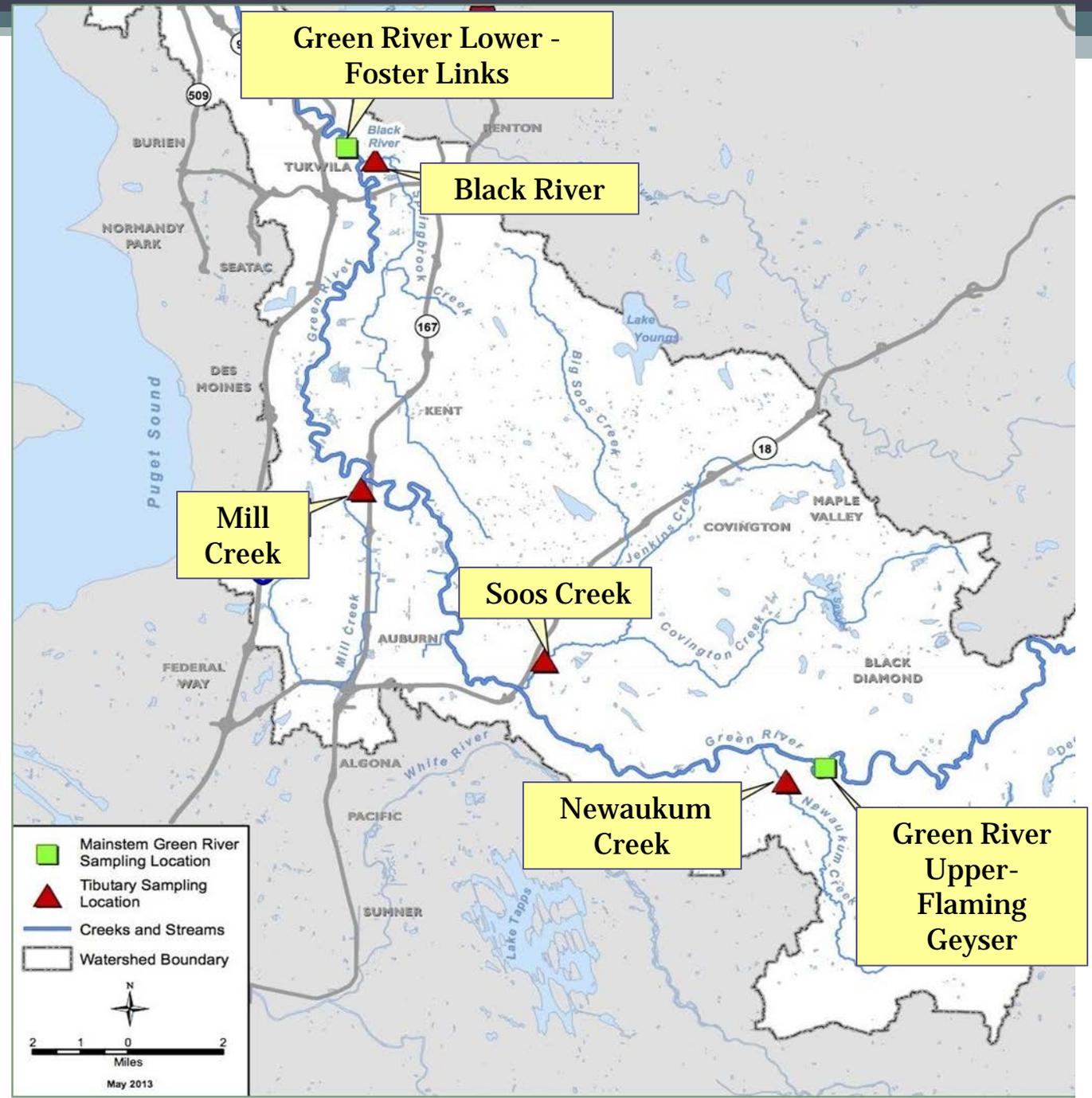
- What are the general chemical characteristics of suspended solids collected over the study period?
- What are initial estimates of the relative contributions of PCBs, PAHs, dioxins/furans and arsenic to the Lower Duwamish Waterway?
  - **Sediment Traps and Filtered Solids**
- How do concentrations of PCBs, PAHs, dioxins/furans and arsenic associated with suspended solids differ between locations during dry season/base flow and wet season/storm conditions?
  - **Filtered Solids**

# Study Area - Sampling Locations

- **Green River**
  - Flaming Geyser (River Mile 41)
  - Foster Links Golf Course (River Mile 10)
- **Newaukum, Soos, and Mill Creeks**
- **Black River/Springbrook Creek**

# Study Area

## Sampling Locations



# Suspended Solids-Sediment Traps

## Two Trap Designs



**Baffle-style Trap**



**Jar-style Trap**

# Suspended Solids-Sediment Traps



**Baffle Trap designed by  
Jim Devereaux of KC Field  
Sciences Unit**

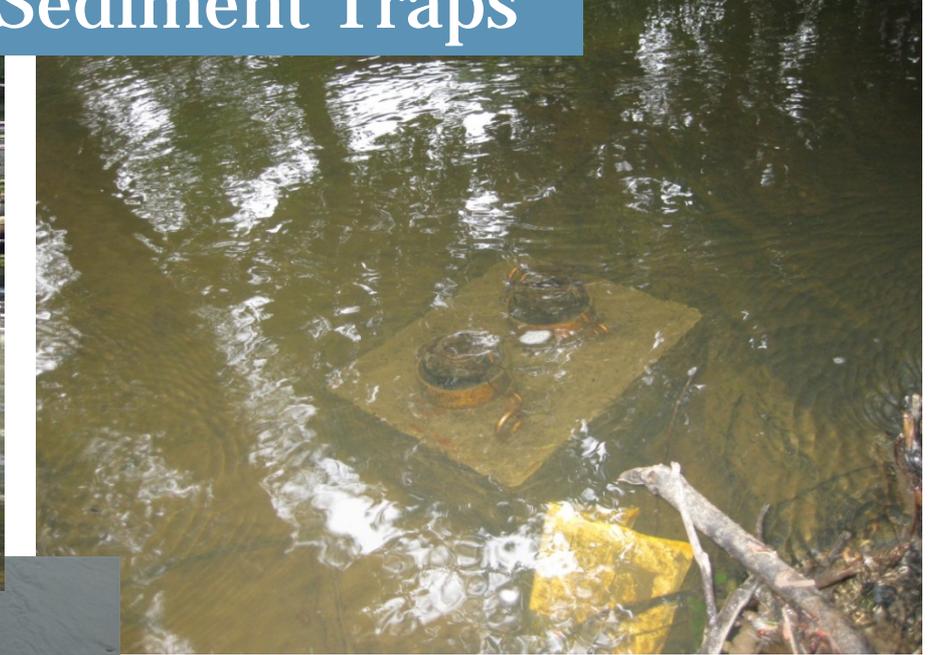


# Suspended Solids - Sediment Traps

- **Target Analytes:**
  - PCBs as Aroclors, dioxins/furans, arsenic\*, PAHs\*, total organic carbon, and particle size distribution
  - subset for PCB congeners
- **Four Collection Periods:**
  - Oct 2012-Feb 2013
  - Mar – May 2013
  - June – Sept 2013
  - Oct 2013 – Jan 2014

\*Likely to obtain data for other metals and other SVOCs based on methods targeted

# Deployed Sediment Traps



## Sediment Traps from Mill, Soos and Newaukum Creeks



# Suspended Solids - Sediment Traps

**Baffle-  
Style Trap  
sample in  
large jar**



**Jar-Style  
Trap sample  
in smaller  
jars**

**Sediment Trap sample from Mill Creek**

# Suspended Solids- Filtered Solids

- Equipment Borrowed from Ecology
- Stream water pumped through filter housing
- Solids captured on 5  $\mu$  polypropylene felt filter, pressure rated to 15 psi



# Suspended Solids- Filtered Solids



**Field  
Deployment**

# Suspended Solids- Filtered Solids



**Filter Bag Being Deployed**

# Suspended Solids- Filtered Solids



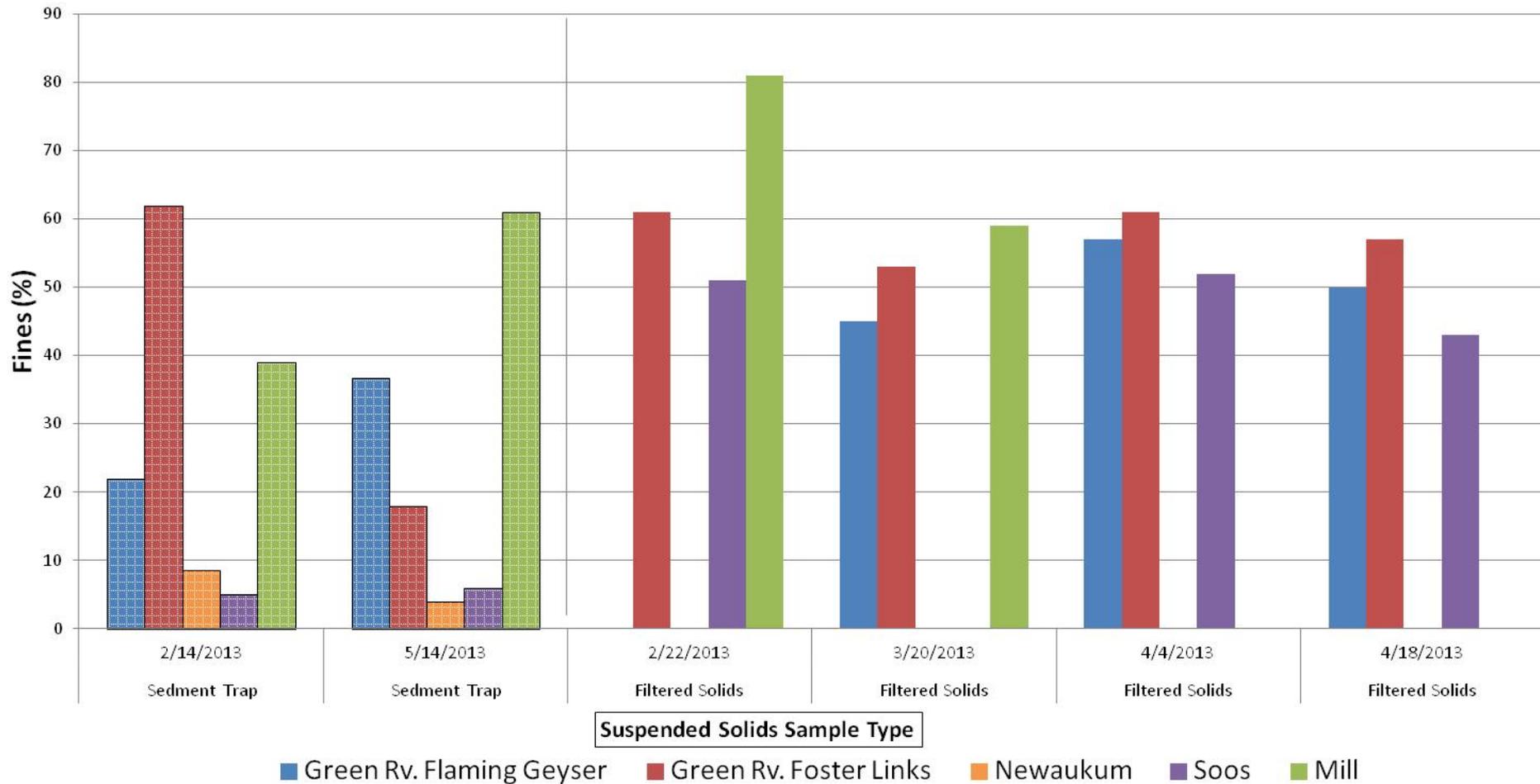
**Processing  
Filters**

# Suspended Solids - Filtered Solids

- **Target Analytes:**
  - PCBs as Aroclors, dioxins/furans, arsenic, PAHs, and particle size distribution and subset for PCB congeners
  - No Total Organic Carbon – false positives from filter material
- **Targeted Sample Collection for each location**
  - One dry baseflow
  - Five storm events/wet season
- **Sampling Feb 2013 through Feb/Mar 2014**

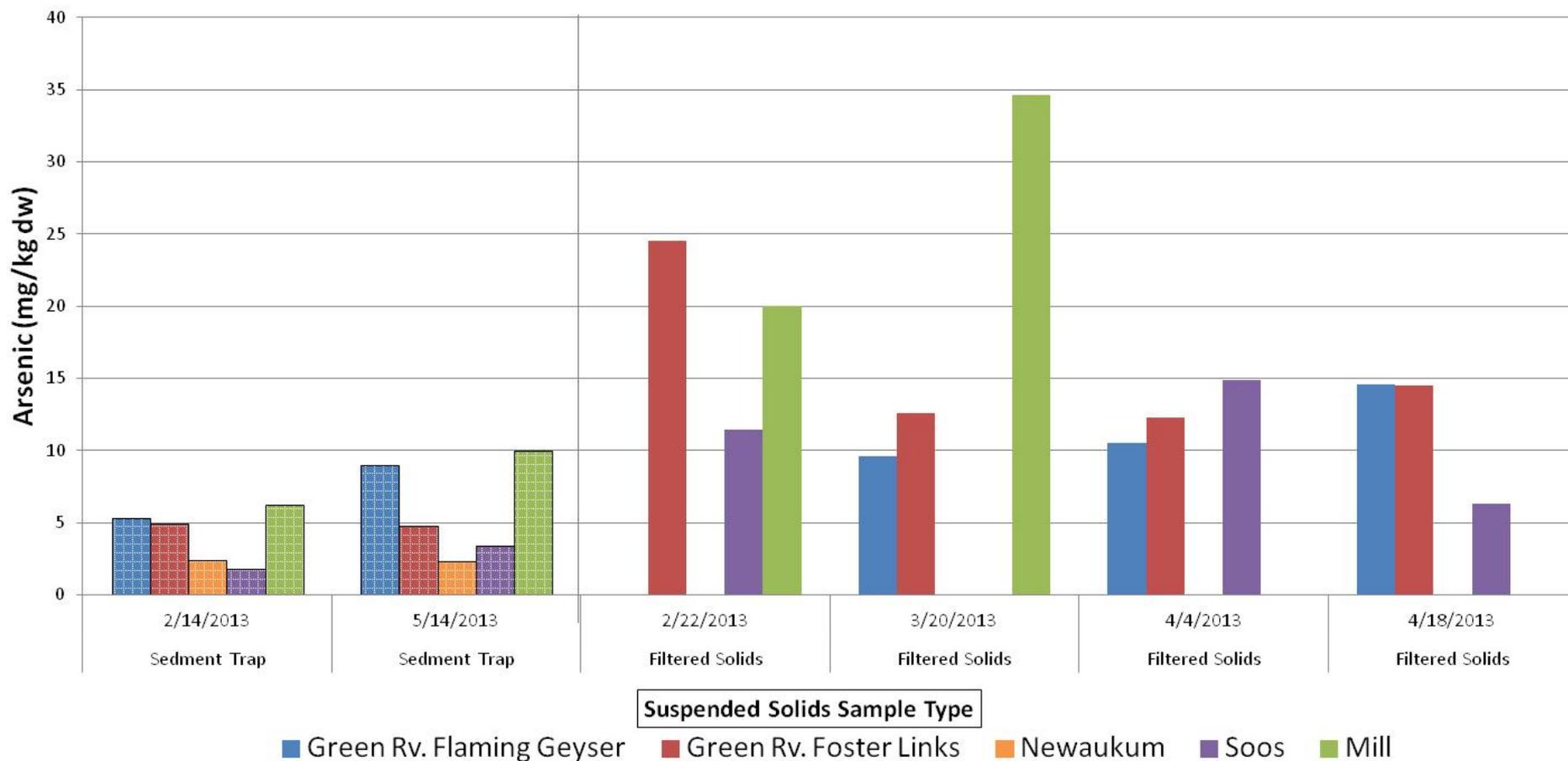
# Preliminary Results

## Green River Basin Suspended Solids Preliminary Fines Data



# Preliminary Results

## Green River Basin Suspended Solids Preliminary Arsenic Data



# Study Schedule

- **Sampling through Feb/March 2014**
- **Laboratory analysis on-going**
- **Data validation and data analysis 1<sup>st</sup> and 2<sup>nd</sup> quarter 2014**
- **Draft Data Report 3<sup>rd</sup> quarter 2014**

# Acknowledgements

- *KC Field Sciences Unit*: Jean Power, Jim Devereaux, Stephanie Hess, Ben Budka, Bob Kruger & others
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- AXYS Analytical Services
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- *Foster Links Golf Course*: Curt Chandler and staff
- *Ecology*: Dan Cargill
- *KC Wastewater Treatment Division*: Jeff Stern