Spokane River Regional Toxics Task Force
Technical Track Work Group
April 18, 2023 Meeting

Agenda

- Summary of active projects and status
- Receipt of laboratory data
- 2022 expanded synoptic survey
- Fingerprinting of GE well PCB data
- Groundwater flow direction assessment

Current Study Status

Topics to be Discussed Today in Red

Project	Status
Groundwater flow direction study	Nearing completion.
Expanded synoptic survey (plus catch basins and artesian well)	Monitoring completed, received ~75% of lab results. Mass balance conducted using available data.
Sediment/biofilm	Monitoring completed, waiting on lab results.
Long term water column trend assessment	Low & moderate flow monitoring completed, no lab results. QAPP for high flow monitoring ~~approved~~ by Ecology.
Fish tissue trend assessment	Sampling completed by WDFW, waiting on lab results.
GE fingerprinting	Waiting on 2022 lab results Preliminary fingerprinting conducted using 2018 data.

Receipt of Laboratory Data

- Lack of laboratory results is jeopardizing proper completion of projects
  - Amount of review time of draft reports by TTWG/Task Force
  - Independent validation of lab results
  - Upload of data to EIM
- April 17 conversation with SGS/AXYS
  - Fish data to be sent within a day, SPMD data soon
  - Reiterated that results will be of little value if not delivered soon
    - April 30 cutoff date for all data
- Options for moving forward
  - What do we do if April delivery deadline is not met?

2022 Expanded Synoptic Survey

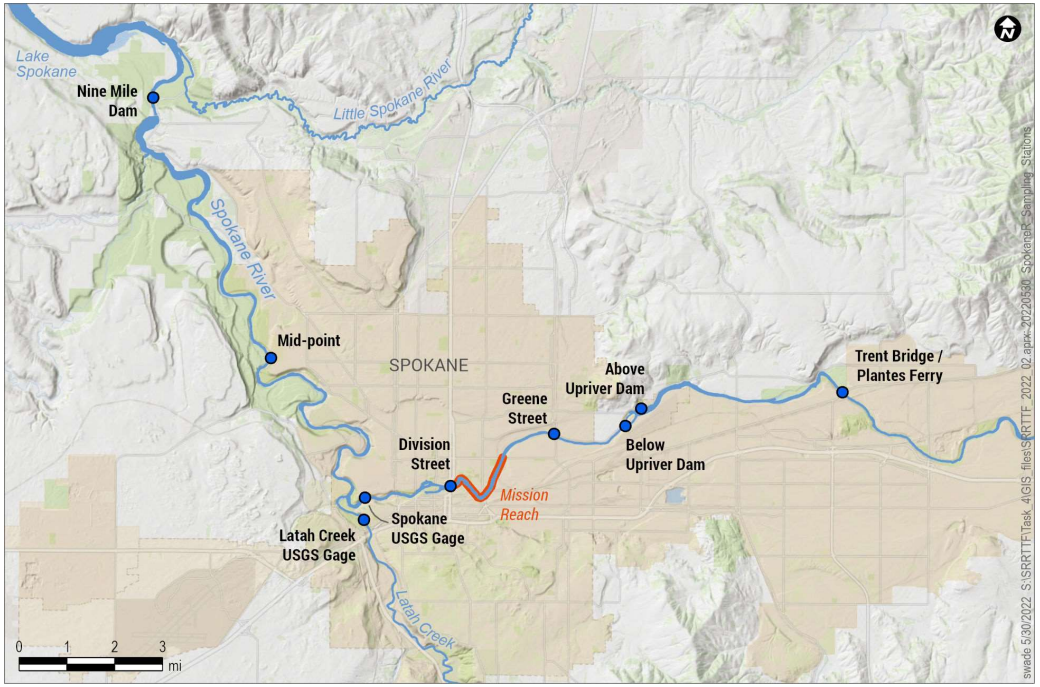
- Purpose
  - Support updated mass balance assessment
  - Verify elevated PCB concentration in artesian well observed in 2021
  - Assess stormwater catch basin PCBs in the area identified by the PCB-sniffing dog
- Results status
  - Artesian well
    - Results have been obtained
  - Synoptic survey to support mass balance assessment
    - ~75% of results obtained
  - Stormwater catch basins
    - No results obtained

2022 Artesian Well Results

- Background
  - Discharge to Mission Reach observed by Ecology during summer temperature float
  - Single PCB sample in 2021 measured 2100 pg/l
- Results
  - Two samples collected in 2022
    - 1300 and 1500 pg/l
  - Confirmation that this source consistently discharges PCBs at 10x the concentration in the river
  - Significance of this load will be assessed via the mass balance

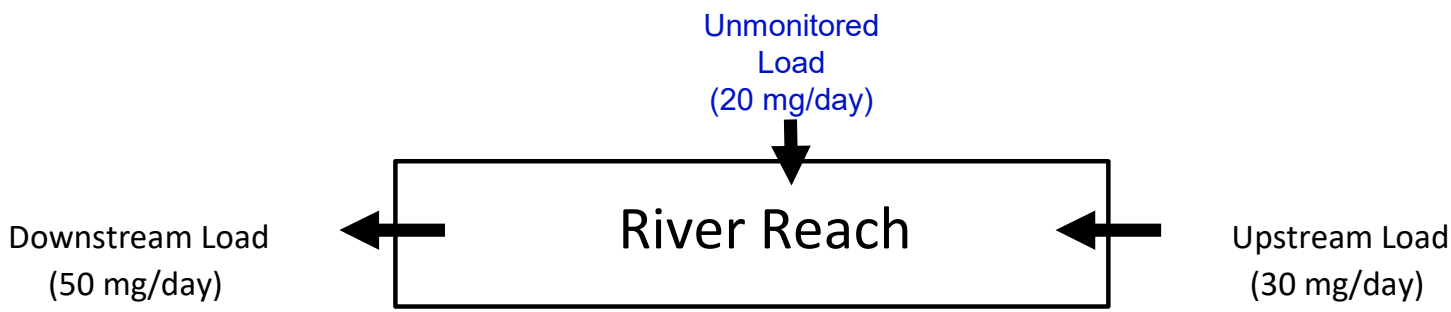
2022 Mass Balance Assessment

- Purpose
  - Add stations to provide more spatial resolution than prior assessments
    - Provide insight on homolog shift observed near Upriver Dam
    - Mass balance specific to Mission Reach
    - Divided the reach between USGS Gage and Nine Mile into two parts
  - Allow congener-specific mass balances
    - PCB 11
    - Upstream/downstream of GE site



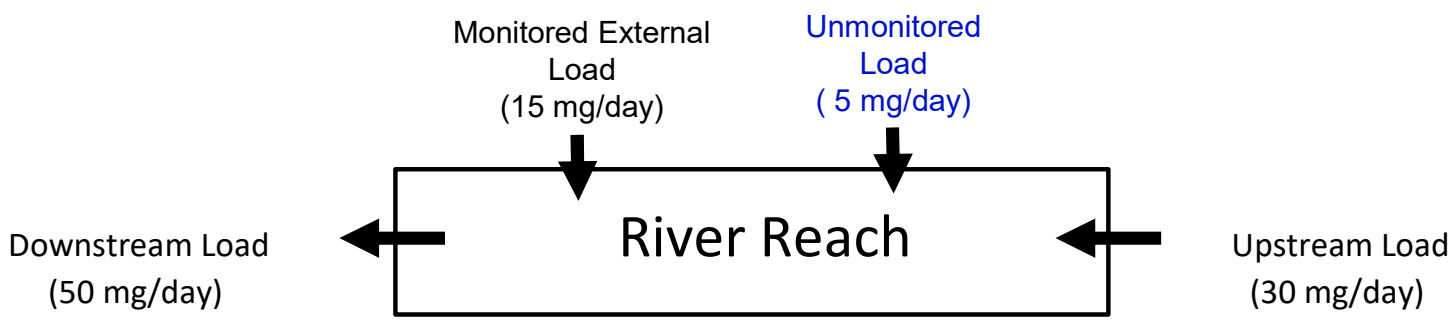
Mass Balance Approach

- Measure flow and concentration of known loading sources
  - Point source, tributaries
- Calculate presence of unmonitored load entering the river between upstream and downstream stations
  - Measure flows and concentrations during steady state conditions
  - Unmonitored load = Downstream load – upstream load



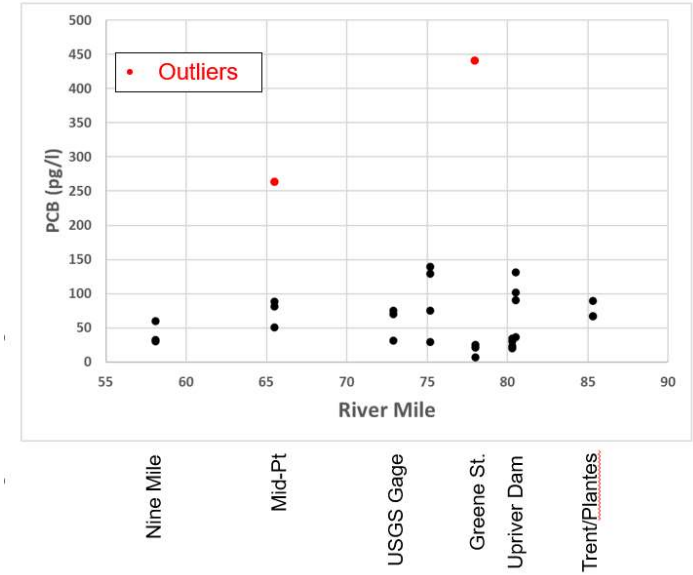
Mass Balance Approach with Monitored External Load

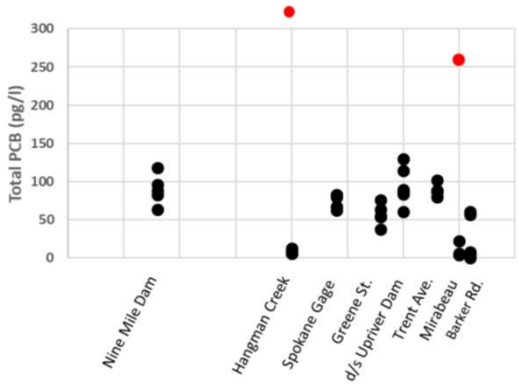
- Measure flow and concentration of known loading sources
  - Point source, tributaries
- Calculate presence of unmonitored load entering the river between upstream and downstream stations
  - Measure flows and concentrations during steady state conditions
  - Unmonitored load = Downstream load – upstream load – monitored load



2022 PCB Concentrations
Data Received to Date

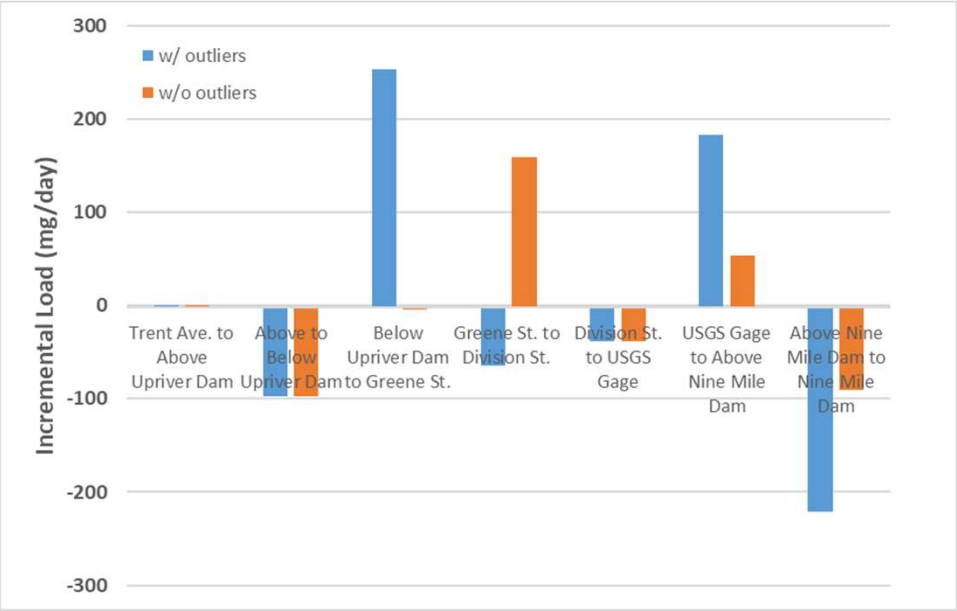
- Concentrations generally range from 20 to 150 pg/l
- Two outliers
  - 440 pg/l at Greene St.
  - 260 pg/l between USGS Gage and Nine Mile
- Similar range of concentrations as in 2018





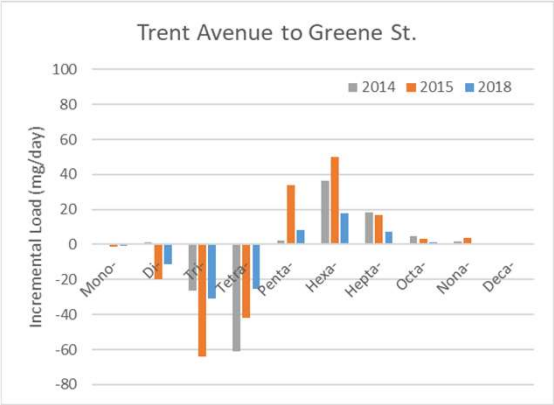
2022 Mass Balance
Using Data Received to Date

- Results highly dependent on treatment of outliers
- Too early to draw strong conclusions
  - Variability in concentrations makes it difficult to discern “non-significant” loads

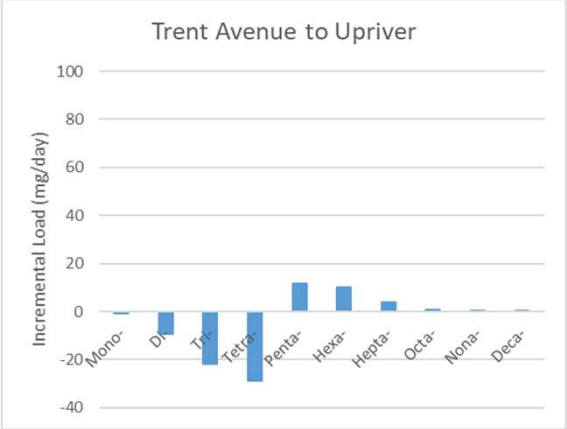


Homolog Balance between Trent and Greene

- Previous homolog-specific mass balances had shown a homolog shift between Trent Avenue/Plantes Ferry and Greene St.

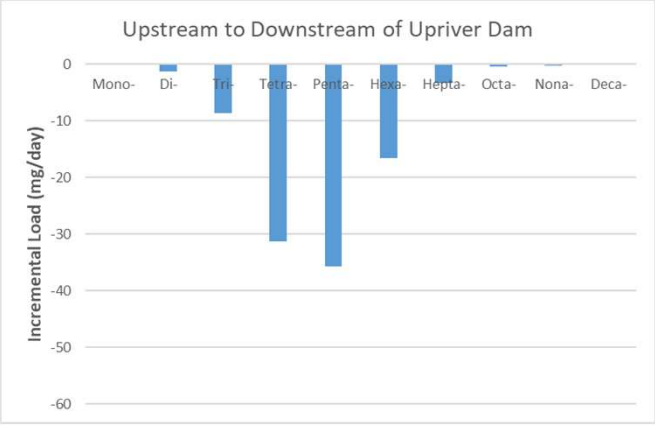


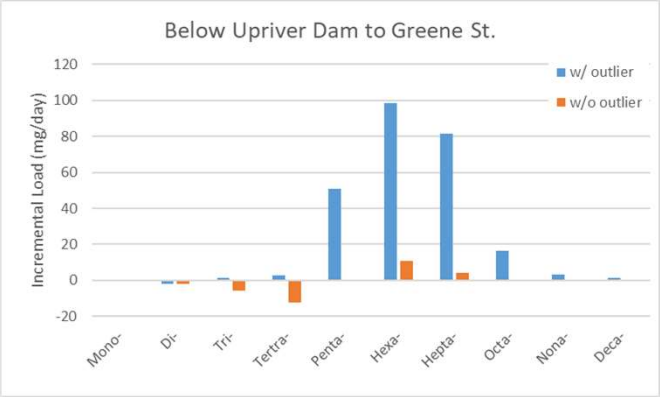
- 2018 mass balance added a station downstream of Upriver Dam
  - Suggested that the loss of lower chlorinated homologs was occurring between Trent and below Upriver Dam



2022 Homolog Balance near Upriver Dam

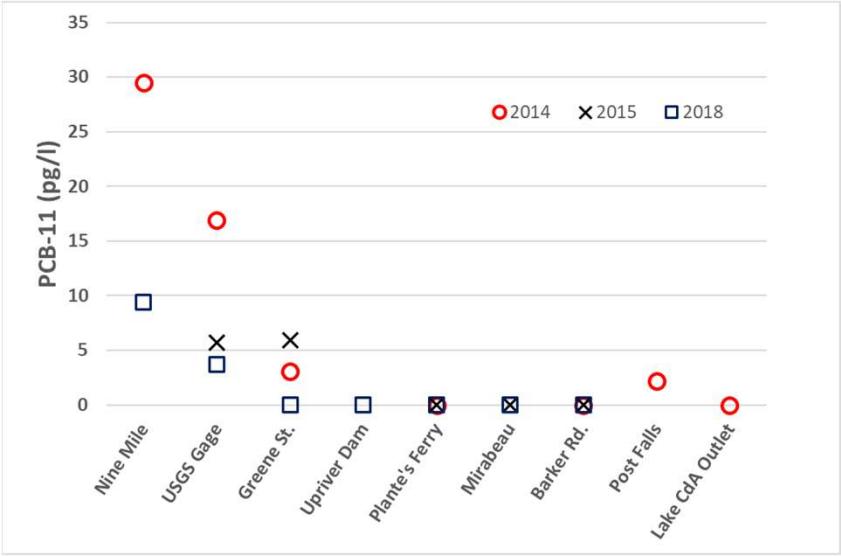
- 2022 mass balance added an additional station upstream of Upriver Dam
  - Interim results suggest that homologs are being lost as water passes through Upriver Dam
  - Results from downstream of Upriver Dam to Greene St. confounded by outlier data value at Greene





PCB-11 Mass Balance

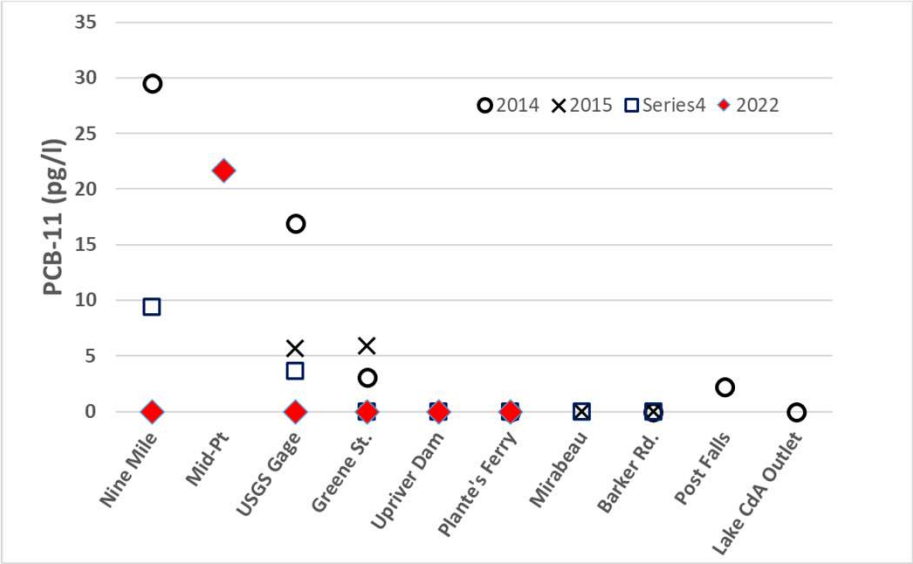
- Initial investigation of sources of PCB-11 conducted in 2021
  - Concluded that concentrations were largely indistinguishable from blanks upstream of Greene St. and increased downstream from there



  - Mass balance assessments of 2014, 2015, and 2018 survey data showed potential for an unknown source occurring downstream of USGS gage in 2018

PCB-11 Mass Balance

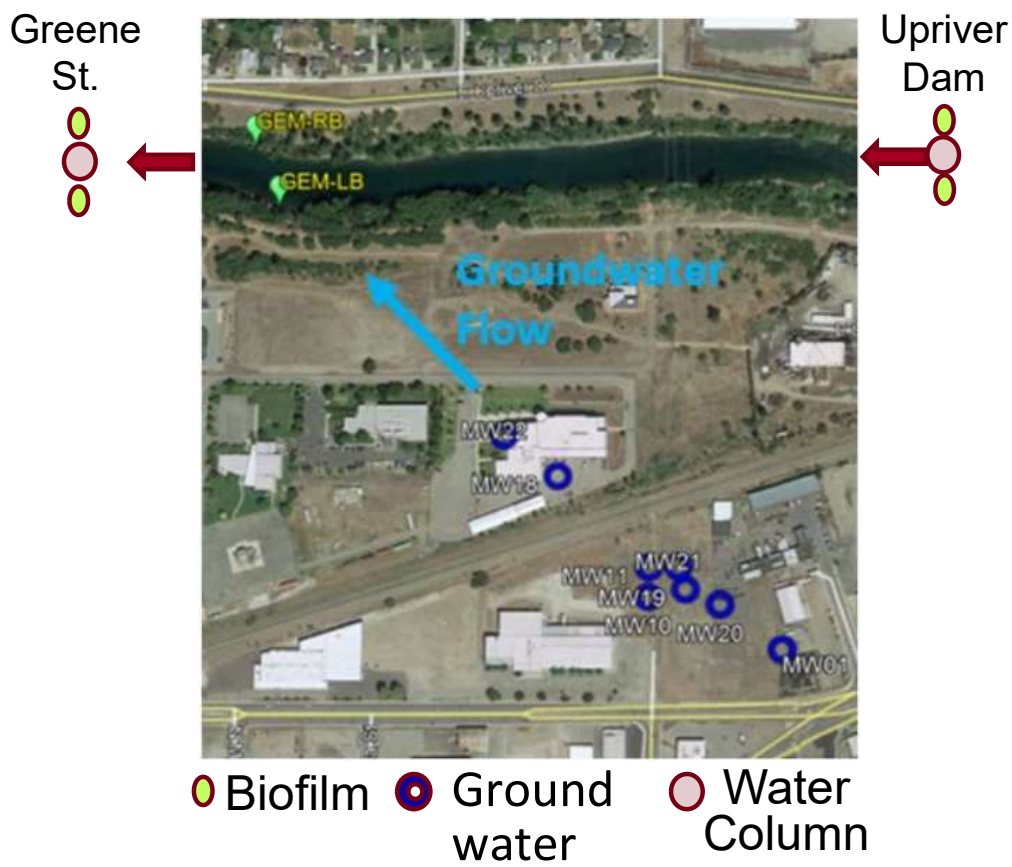
- 2022 data generally consistent with historical spatial trend, but lower (especially at Nine Mile)



- Mass balance assessments using 2022 data show essentially zero incremental load, except
  - +70 mg/day between USGS Gage and mid-way to Nine Mile
  - -70 mg/day between mid-way to Nine Mile and Nine Mile

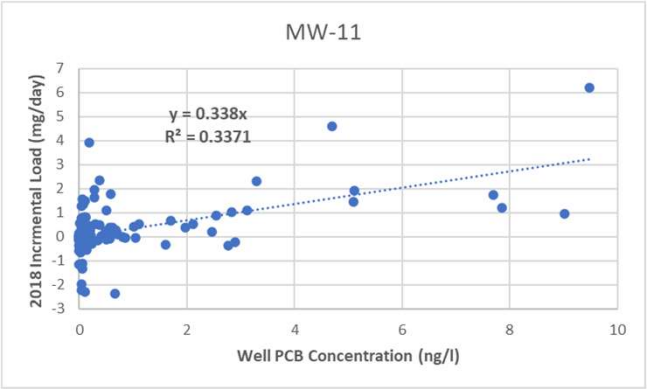
Congener-Specific Mass Balance

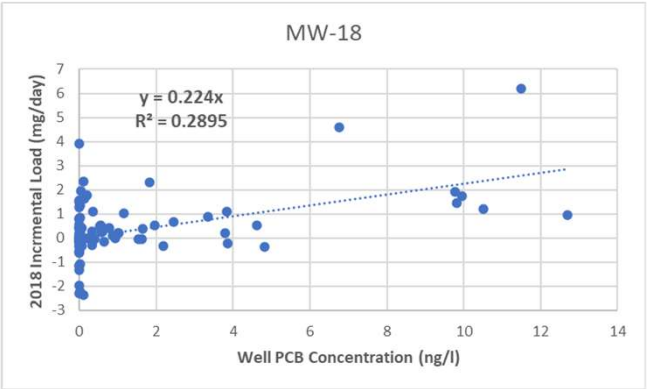
- Conduct congener-specific mass balance for the reach containing GE Site
  - Upriver Dam to Greene St.
- Compare congener pattern of predicted incremental load to observed congener patterns in GE wells



Comparison of Mass Balance Results to GE Well Congeners

- Compared congener pattern of predicted incremental load in 2018 to observed congener patterns in GE wells





  - While not a perfect predictor, strong probability ($p<0.001$) that a relationship exists
- 2022 results confounded by outlier at Greene St
  - Results with no outlier also show positive correlation
  - Inconclusive until remaining data arrive