

Long Term Monitoring Program

Discussion of Recommendations to Task Force

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Spokane River Regional Toxics Task Force

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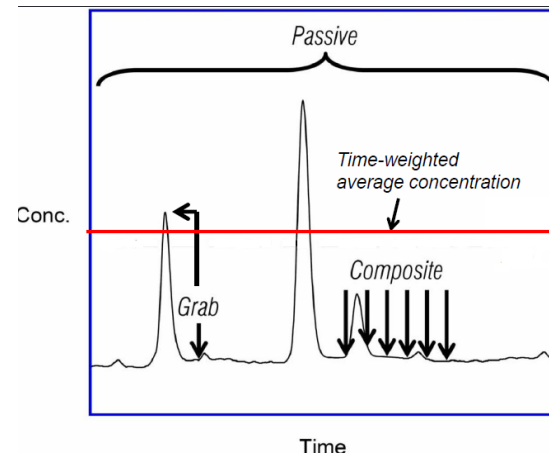
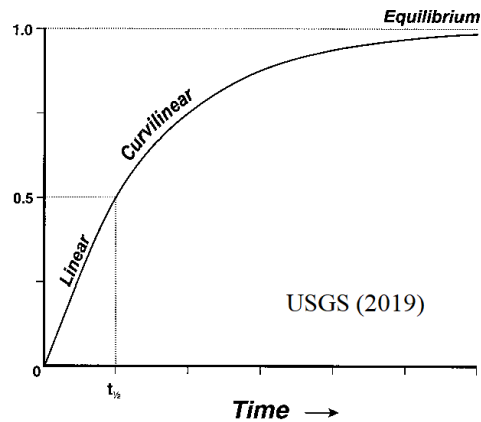


Background

- Reviewed 16 different methodologies for supporting long term monitoring
- Have reached consensus on fish sampling as one component
- Nearing consensus on passive water column sampling as a second component
 - A few details left for discussion
 - Which sampling medium: SPMDs or other?
 - How many stations?
 - How frequently?

Passive Sampling

- Passive = No moving parts
- Deploy sampling device in the field for extended period of time
- Device integrates concentrations over deployment period



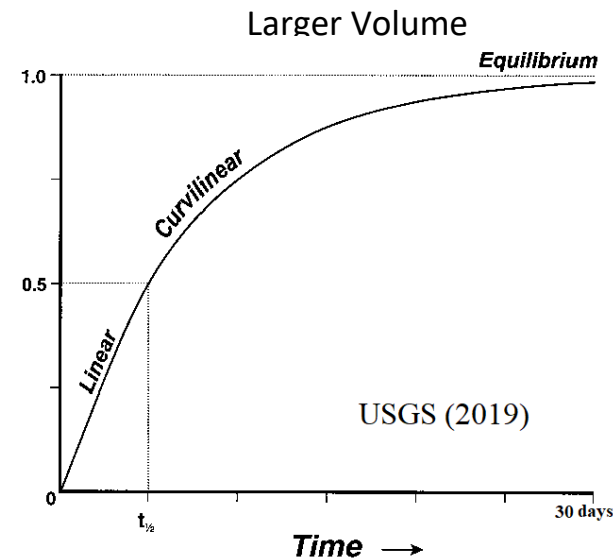
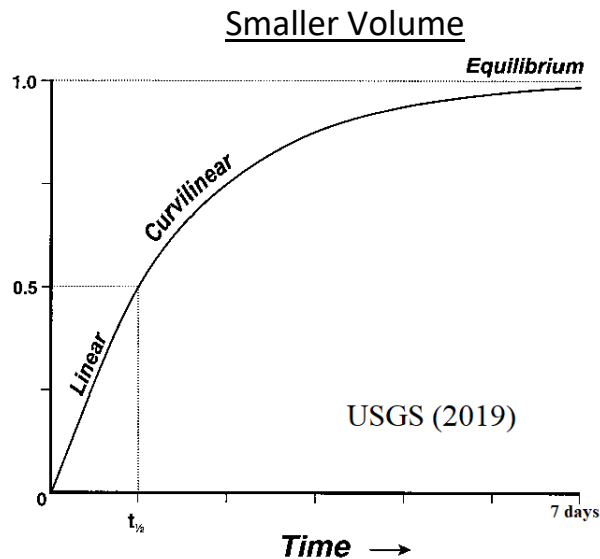
- Many different sampling media have been used
 - SPMDs, polyethylene, polyoxymethylene, polydimethylsiloxane, ...
 - All follow the same basic principle

Evaluation of Passive Sampling Media

- Scientific literature
 - Applications for Passive Sampling of Hydrophobic Organic Contaminants in Water - A Review (Taylor et al, 2019)
 - Application of Passive Sampling for Measuring Dissolved Concentrations of Organic Contaminants in the Water Column at Three Marine Superfund Sites (Burgess et al, 2015)
- Expert interviews
 - David Alvarez, Chief, Environmental Chemistry Branch, USGS Columbia Environmental Research Center
 - Richard Grace, SGS AXYS Analytical Services
- Current field activities at other sites

High Level Review Summary

- Many options exist to accurately characterize PCB concentrations
 - Preference depends on site-specific application
- SPMDs and polyethylene quickly rise to the top for Spokane
 - Possess larger volume of sorbent, therefore better integrate concentrations over the entire month-long deployment



High Level Review Summary

- The field may be trending towards polyethylene
 - “Single-phase polymeric PSDs, such as LDPE and SR are becoming increasingly used due their simplicity and high performance and compatibility with simplified analytical methods for their extraction.” (Taylor et al, 2019)
- Both experts consulted have a preference for SPMDs
 - “Personally, I think your best options are down to the SPMD and PE. I’d lean towards the SPMD due to its larger sampling volume, ease/reproducibility for adding PRCs, and commercial availability” (Alvarez, pers. comm.)
 - “SPMDs are likely the best choice. The SPMDs are more durable in the field, have base case data from WA ECY, and can be readily deployed at 1 month (integrated sample). PEDs do not have the history in very low level environments such as SRRTTF” (Grace, pers. comm.)

How Many Stations/Where to Sample?

- Only imperative location is downstream of Spokane
 - Will show cumulative effect of all load reductions
- Fish sampling being conducted in six reaches
- Intermediate option suggested by Bud Leber

	Comprehensive Plan Table 1 PCB Conc. (pg/L)	Passive Sampling Deployment Areas
Greenacres/Barker Road	24	
Mirabeau Point	37	
Kaiser Outfall		
Trent Bridge/Plante's Ferry Park	133	Downriver of Gaining Reach, Point Sources, and Active MTCA Cleanup Site
Inland Empire Paper Outfall		
Upriver HED		
Spokane County WWTP Outfall		In Reach Containing Point Source, Sediment/Biofilm Spikes, and Closed MTCA
Green Street Bridge	118	
Upper Falls HED		
Monroe Street HED		
Spokane Gauge	154	
City of Spokane WWTP Outfall		Downriver of All Point Sources, Tributary, and Urban Area
Nine Mile HED		
Below Nine Mile Dam	144	

How Frequently?

- Prior assessment recommended three sampling events over the course of a sampling year, corresponding to the three hydrologic regimes
 - spring high flow
 - summer low flow
 - winter moderate flow

Discussion

