Urbanized Stream Source Ratio

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April Quarterly Review

CENTER FOR WATERSHED PROTECTION

Chesapeake Bay Program
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Goals of Proposed Approach

- Define a Stream Source Ratio (SSR) that quantifies the relative load attributed to in-stream sources (e.g. bed & bank erosion, resuspension)
  - Improve alignment of source area load reductions with upland and in-stream BMPs in the Watershed Model

$$SSR = \frac{Bed\ \&\ Bank\ Erosion}{Bed\ \&\ Bank\ Erosion + Upland} = \frac{E}{E + U}$$

From Smith and Wilcock (2015)
E = Lowland Bank Erosion
U = Upland Sediment Supply

Regression Parameters

- Urban Corridor Regression Parameters dev. from:
  - Previous efforts
  - Available data

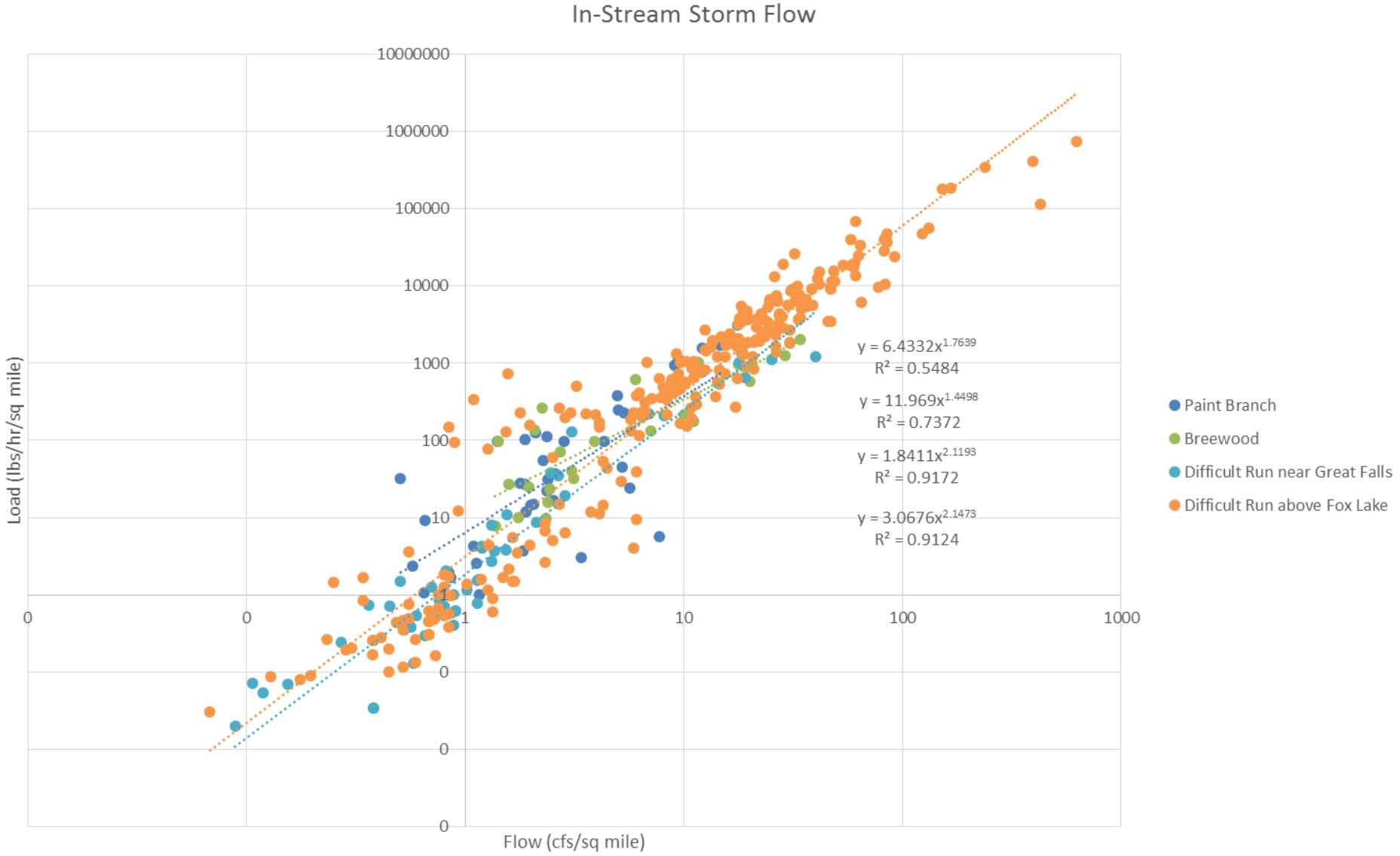
Upland watershed data – variables affecting delivery of water and pollutant to stream (catchment hydrology)	
Parameter	**Potential Data Source**
Impervious cover	Local data – planimetric; NLCD
Forest cover	Anderson Level II (from State e.g. MDP)
Soil type	SSURGO
Riparian land cover/buffers	Local data
Storm drainage density	Local/ MS4 data; connectivity indicator
Density of outfalls	Local/ MS4 data
BMP implementation	Local/ MS4 data; % IC treated or other

Background Data

- New approach to use monitoring data to develop flow-load/concentration relations
- CBWM hourly flow as proxy for monitored flow
- Mean upland concentration used for upland load
  - Watershed specific, where available
- SSR estimated as a result
- Relate drainage area characteristics to SSR
  - And/or flow-load/conc. trend
- Draft example predictive regression based on four watersheds:

$$SSR = -0.04 * DA - 0.48 * HSG\ CD$$
$$-0.03 * Riparian + 1.21$$

Flow-Load Relation



Next Steps

- Compare SSR results with USGS efforts (WVU stream cross sections and sediment budget) for Difficult Run
- Add watersheds from Baltimore City and Baltimore County with sediment data
- Test SSR for annual variability