Modeling Framework Design
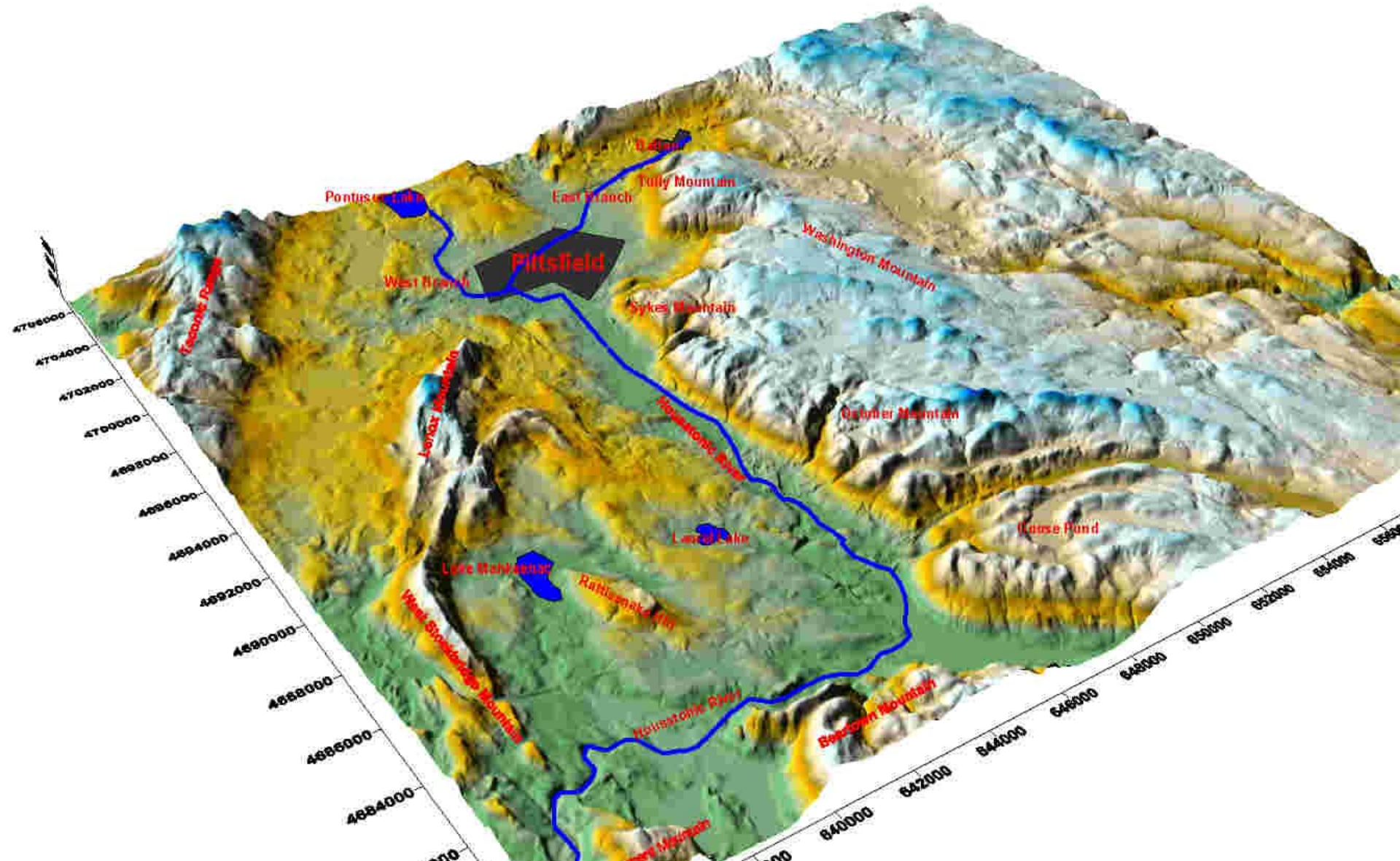
Richard DiNitto

Sleeman Hanley & DiNitto, Inc.

Evaluation of Site Data/Information

- **Surface Water:**   ~500 samples
- **Sediment:**   ~10,000 samples
- **Soil:**   ~12,000 samples
- **Biota:**   ~2,000 samples

- **Other Site Information (selected):**
    - Meteorological data
    - Historical aerial photography
    - Surface water velocity measurements
    - Grain size analysis
    - Organic carbon analysis

Hydrology 2001	
Hydrology 1990	
Hydrology 1972	
Hydrology 1952	

Estimated PCB Mass

PCB Mass in pounds:

In Floodplain Soil **(269,000 lbs/122,000 kg)**

In River Channel Sediment **(204,000 lbs/93,000 kg)**

300,000

250,000

200,000

150,000

100,000

50,000
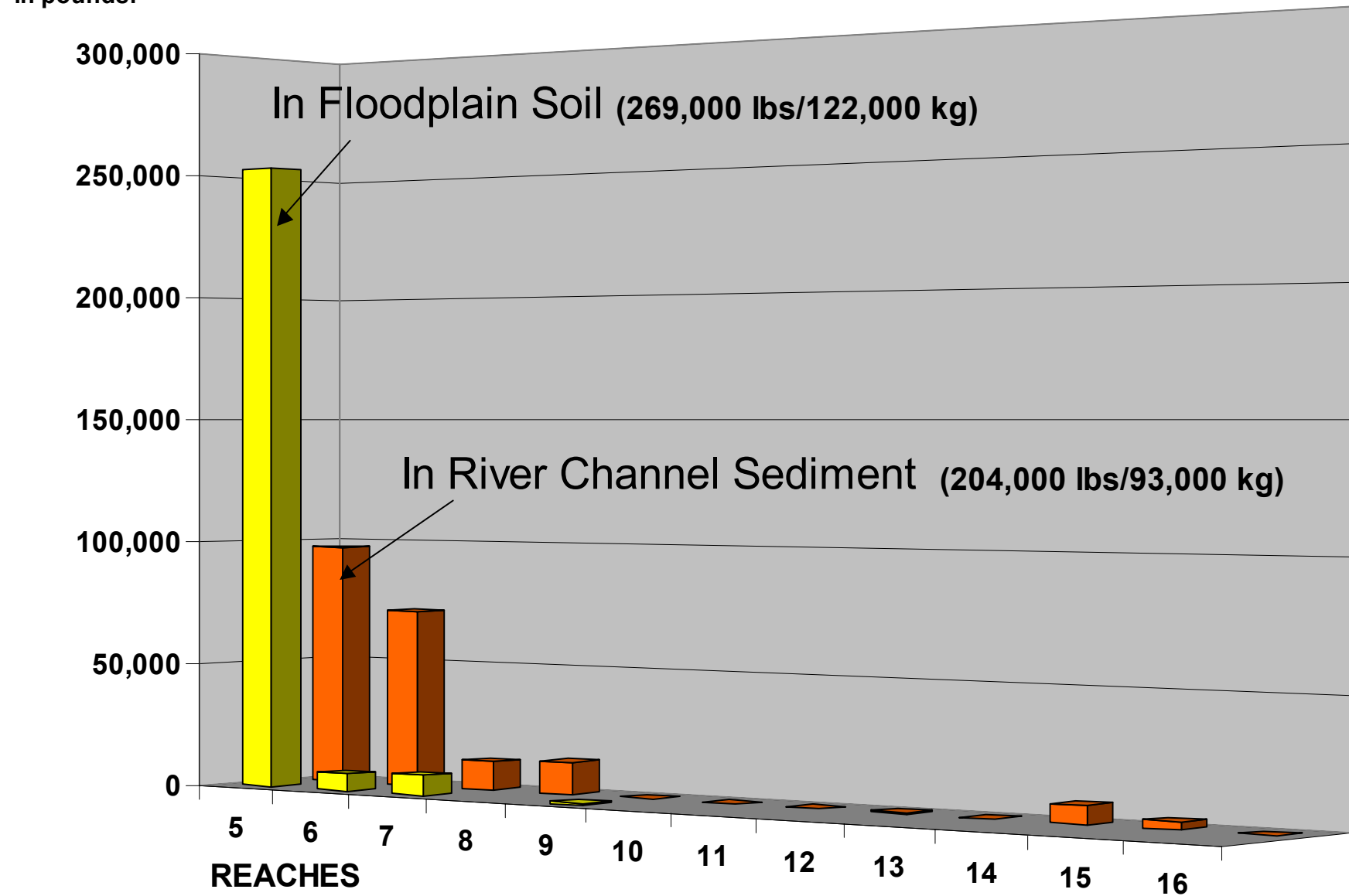
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REACHES

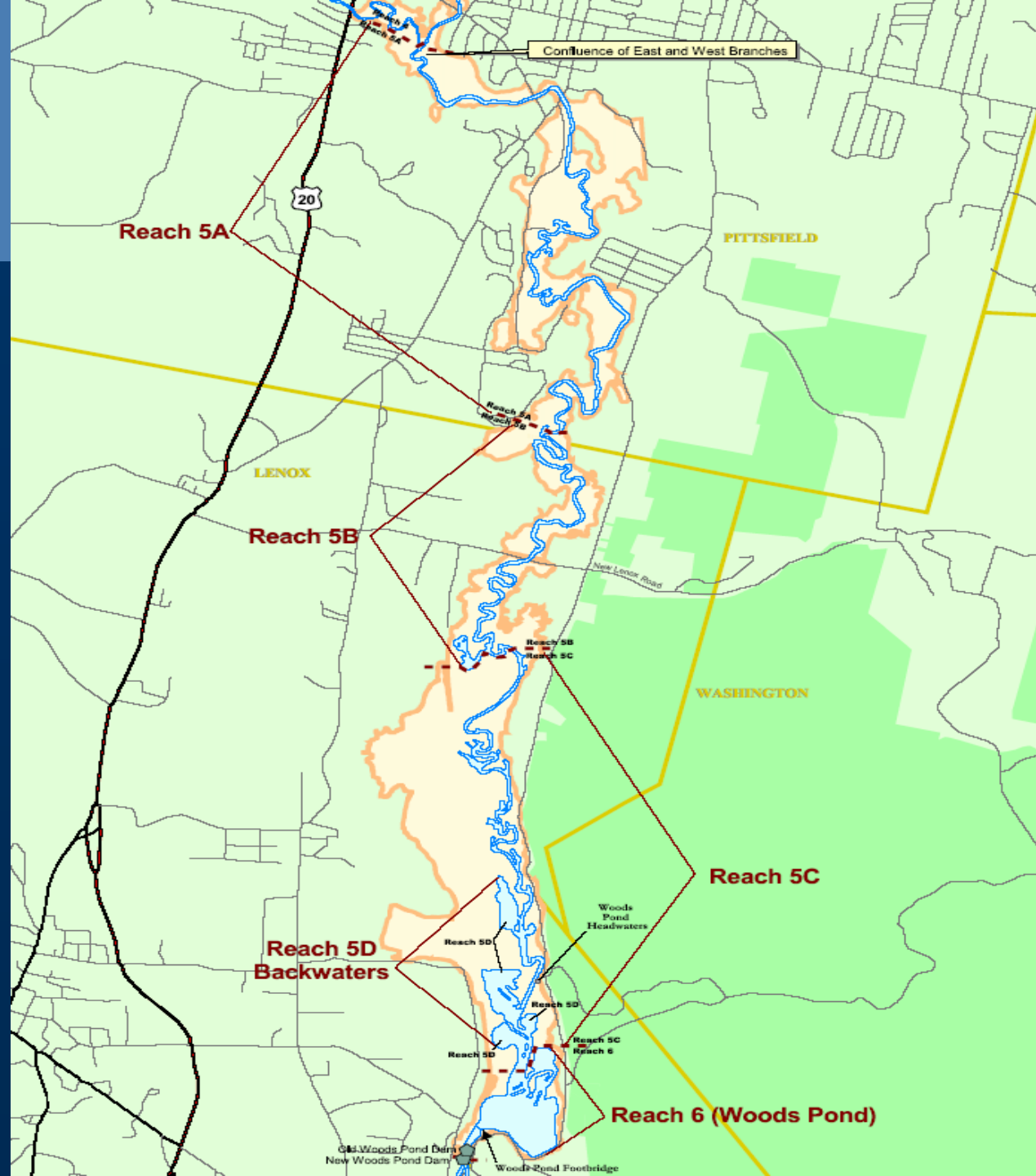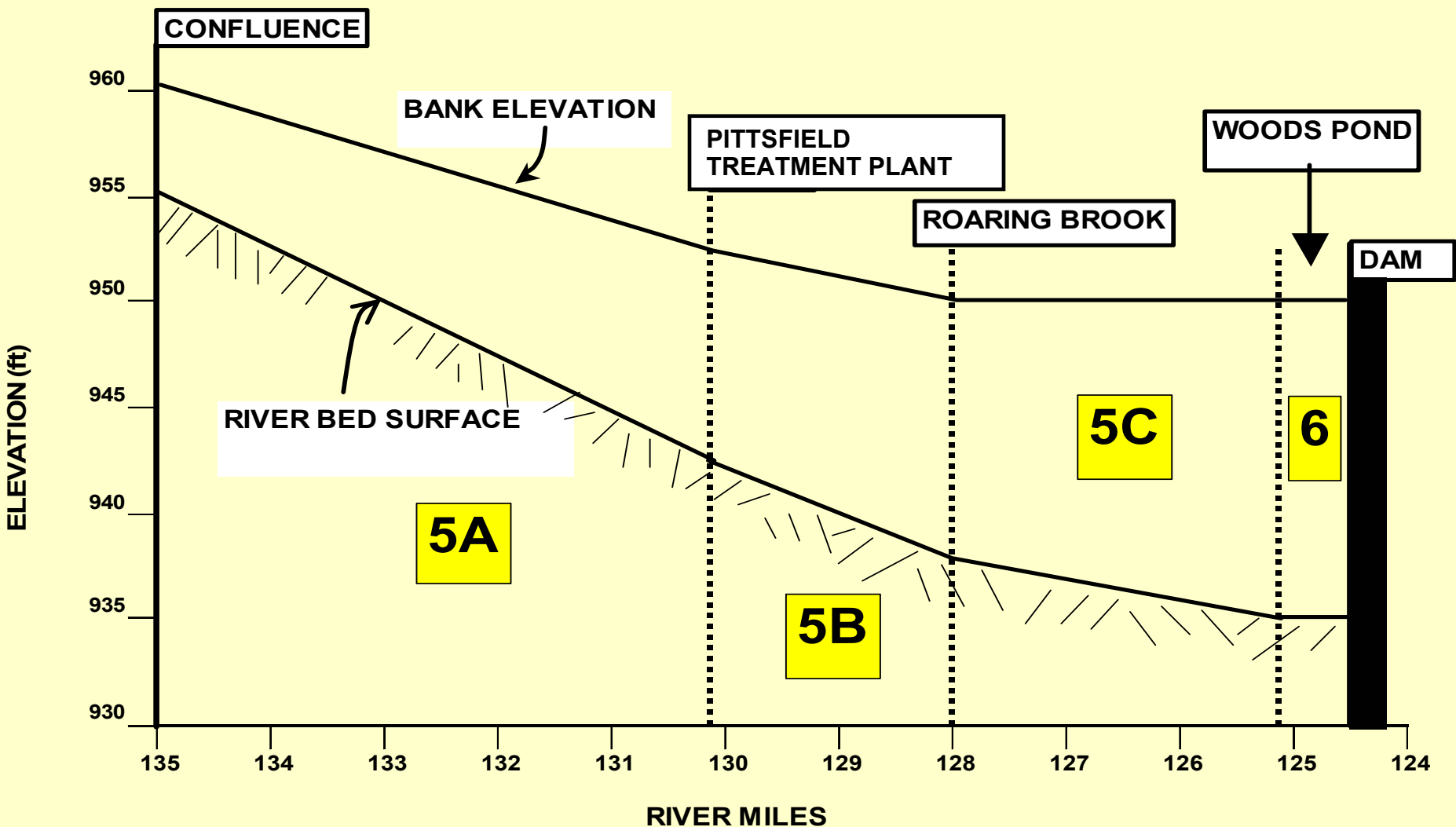5   6   7   8   9   10   11   12   13   14   15   16

Primary Study Area (PSA)

Parallel Cross-section of PSA
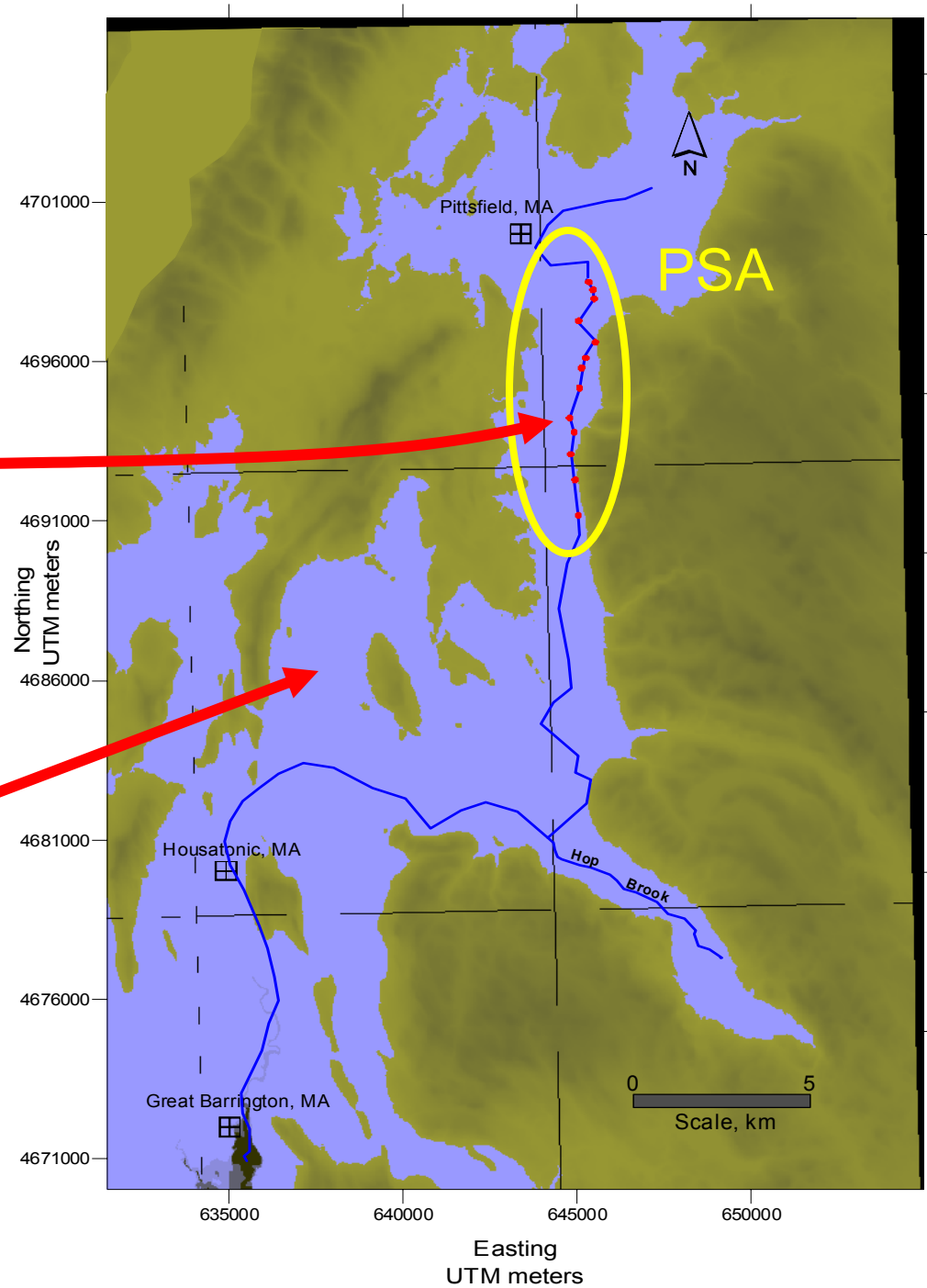## Conceptual Model - Hydrodynamics

Sediment Stratigraphy
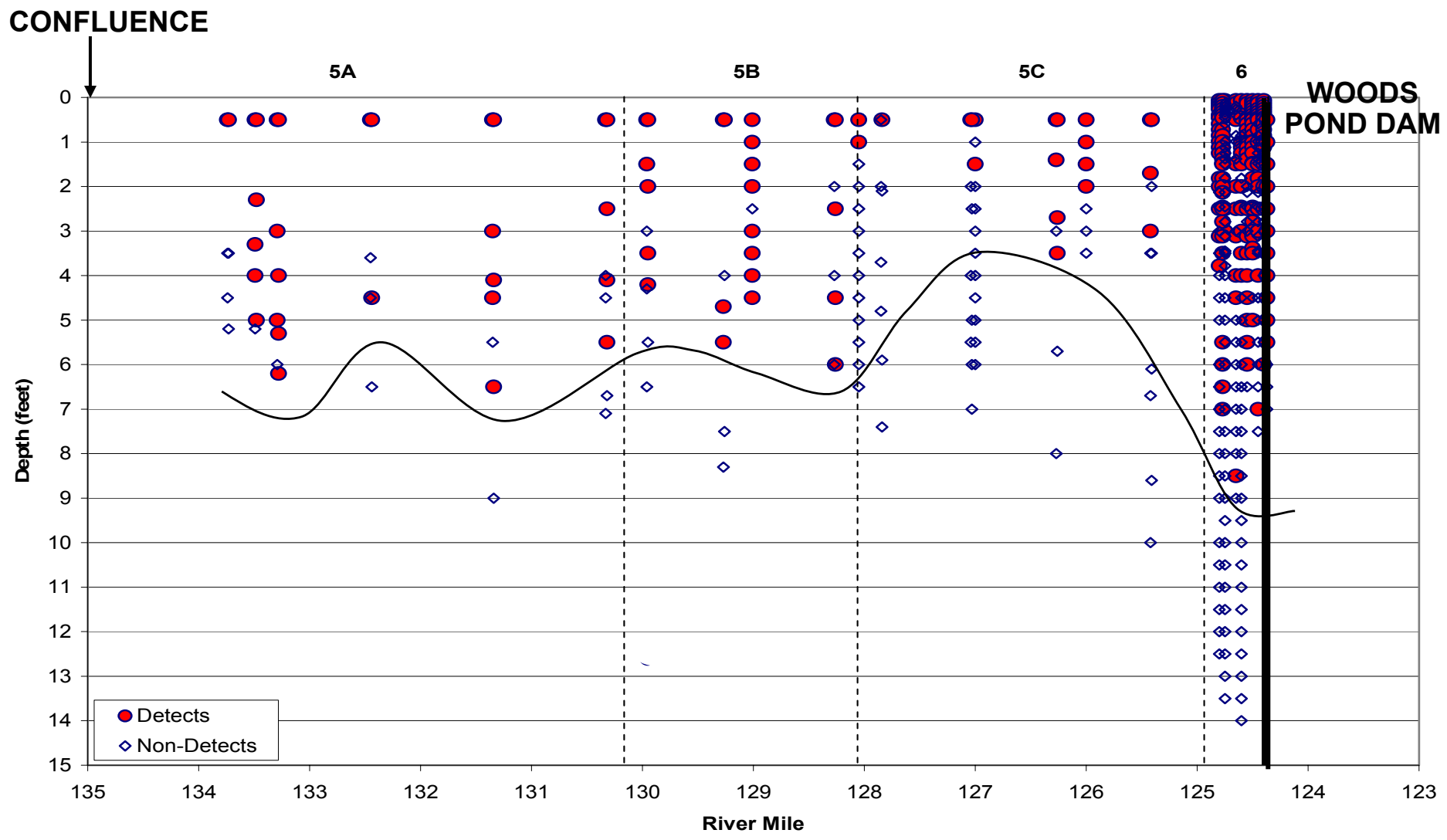
Locations of Deep Cores (red dots)

Glacial Lake Housatonic
(in blue)

River Deep Cores
Plot of Sediment Samples by River Mile and Depth

Perpendicular Cross-Section PSA

Black Ash-Red Maple-Tamarack Calcareous Seepage Swamp — black ash, red maple, bur oak — D

Deep Emergent Marsh — backwater of Housatonic River — E

Transitional Floodplain Forest — silver maple

Low Gradient Stream — Housatonic River — silt and fine organic particle substrate

Red Maple Swamp — red maple — F G

Northern Hardwood-Hemlock-White Pine Forest — Woodland Road
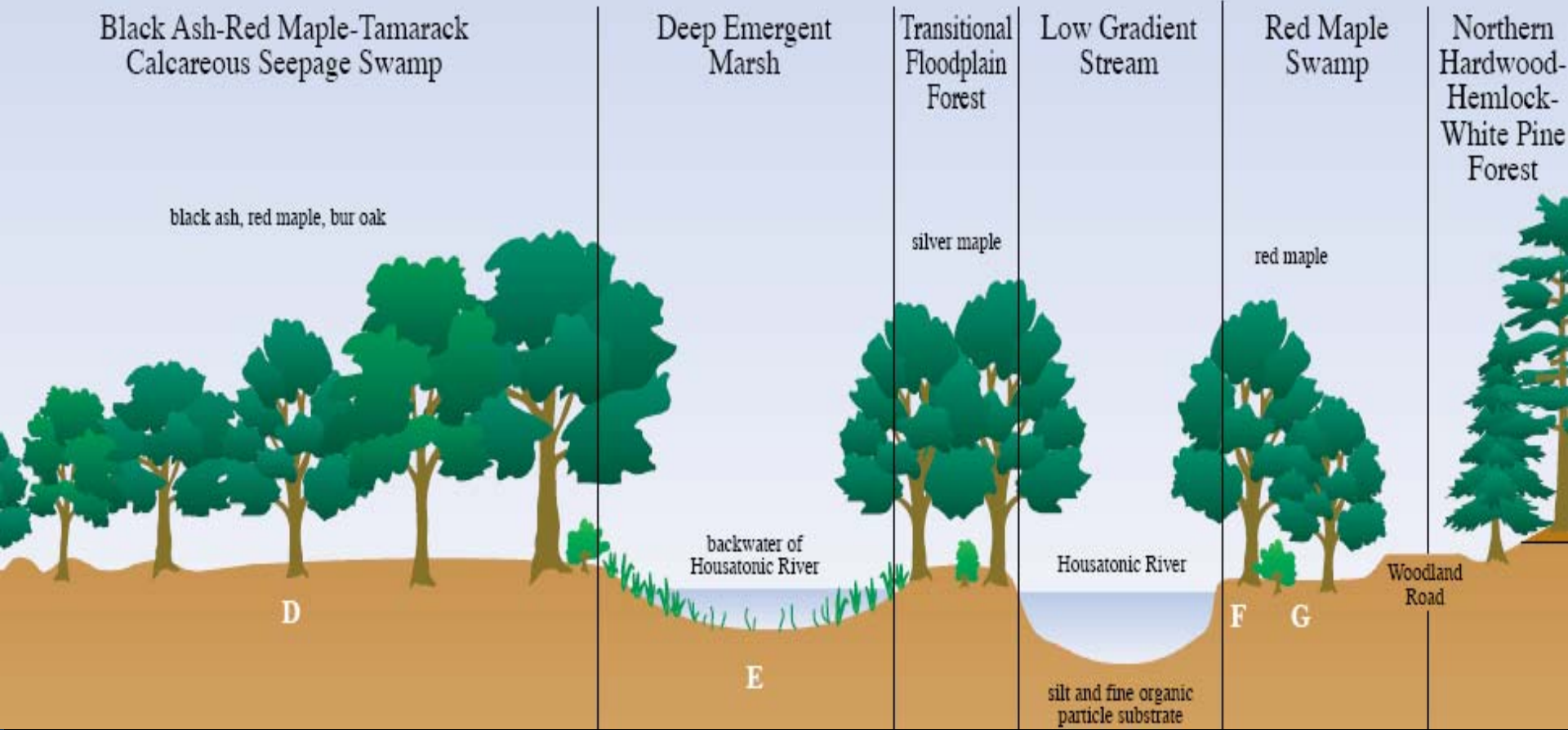
Conceptual Model

- Processes Evaluated

	PROCESSES EVALUATED
Hydrology	Precipitation
	Evapotranspiration
	Infiltration/Soil Storage
	Surface Runoff
	Depression Storage
	GW flow & discharge
	Tributary loading
Hydrodynamics	Water velocities
	Flow resistance
	Thermal balance/heat transfer
	Wind driven circulation
Sediment Transport	Resuspension/erosion
	Bed armoring
	Bioturbation
	Anthropogenic influences
	Deposition/burial
	Flocculation (suspended load)
	Bed Load Transport
	Suspended Load Transport
	Channel evolution
	Upstream & Tributary loading
PCB Transport & Fate	Sorption/desorption (partitioning)
	Diffusion
	Advection
	Volatilization
	Dechlorination
	Upstream & Tributary loading
	Atmospheric loading
Bioaccumulation	Partitioning
	Direct uptake
	Dietary uptake
	Assimiliation
	Elimination
	Biota transport

Conceptual Model Diagram