

Mercury TMDL Update South River Basin, Virginia

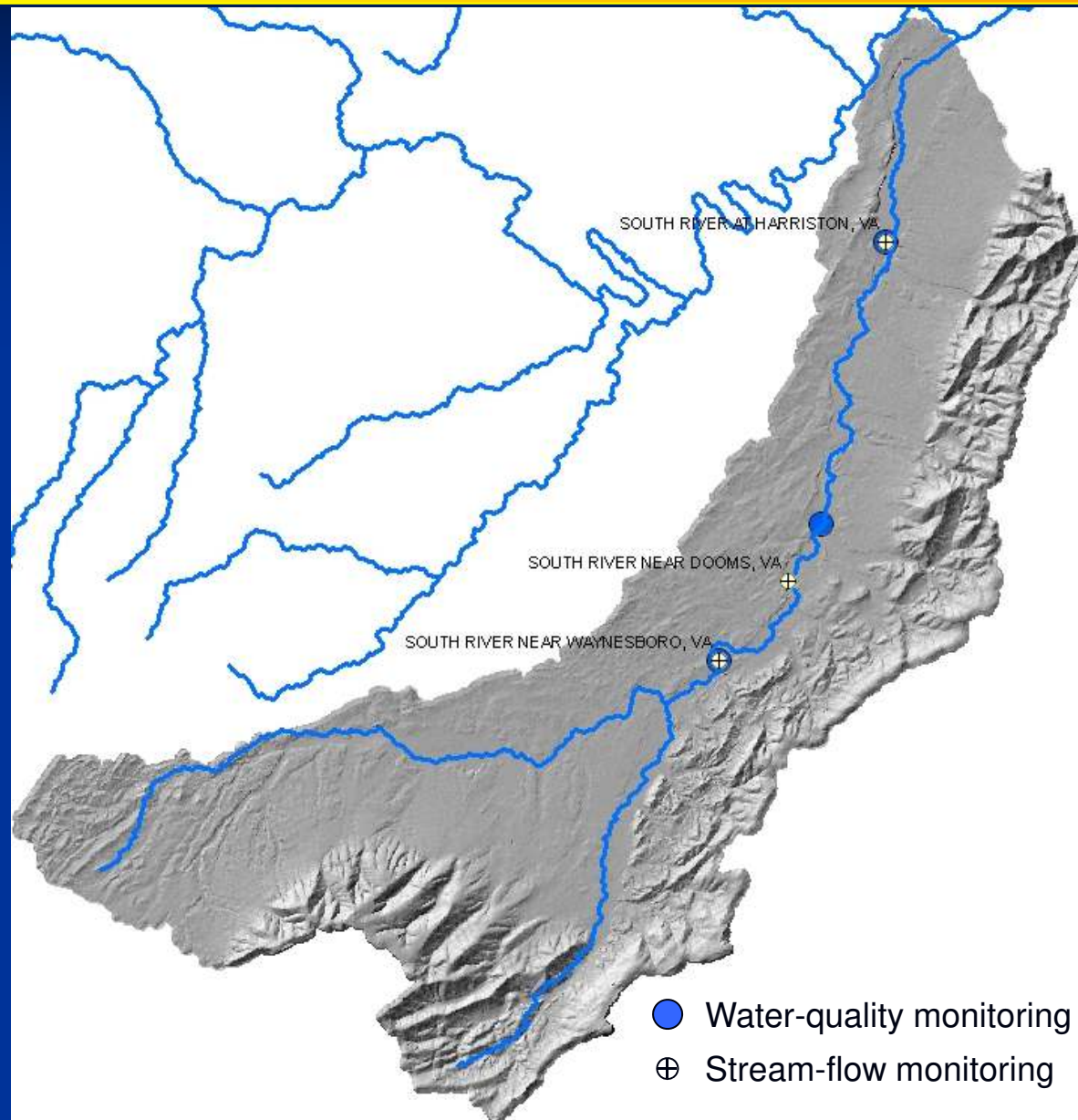
Jack Eggleston



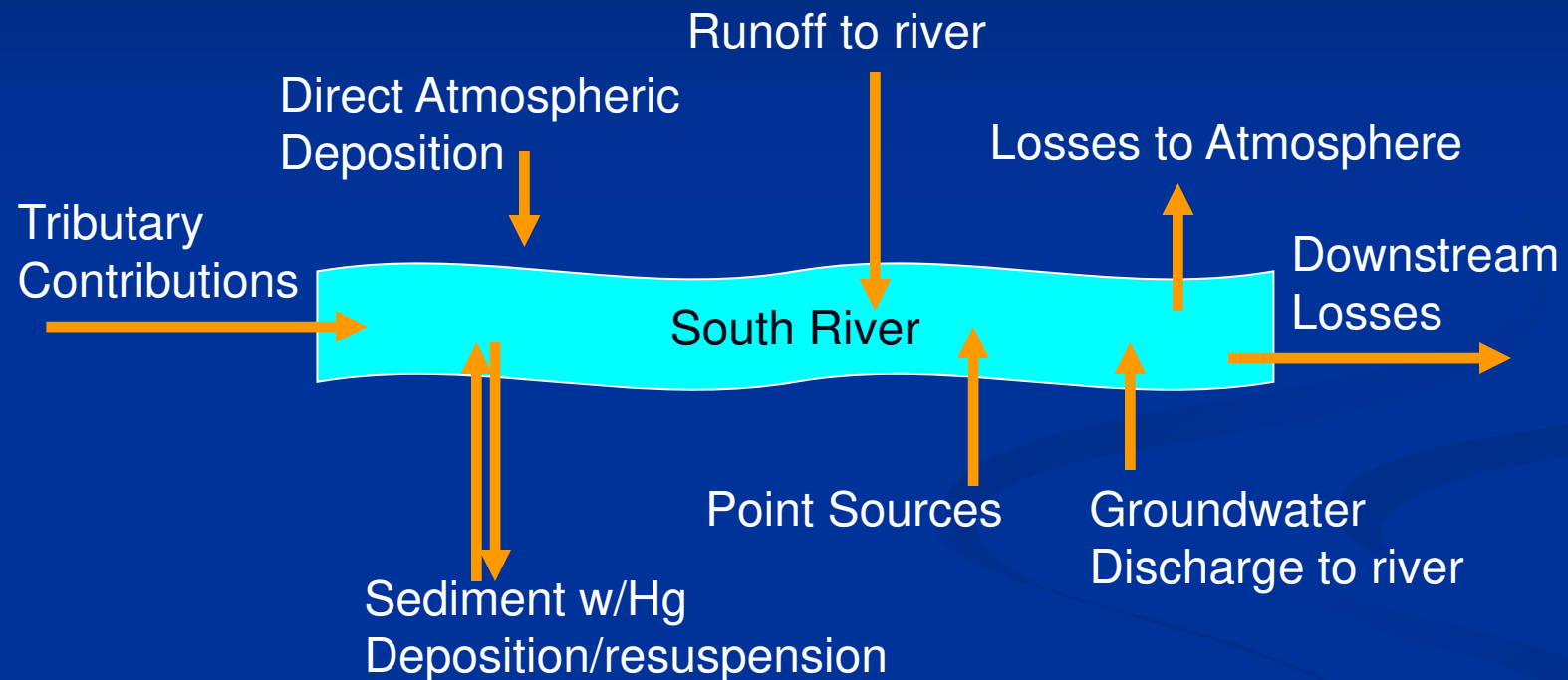
Cooperating Agencies



South River Monitoring Sites

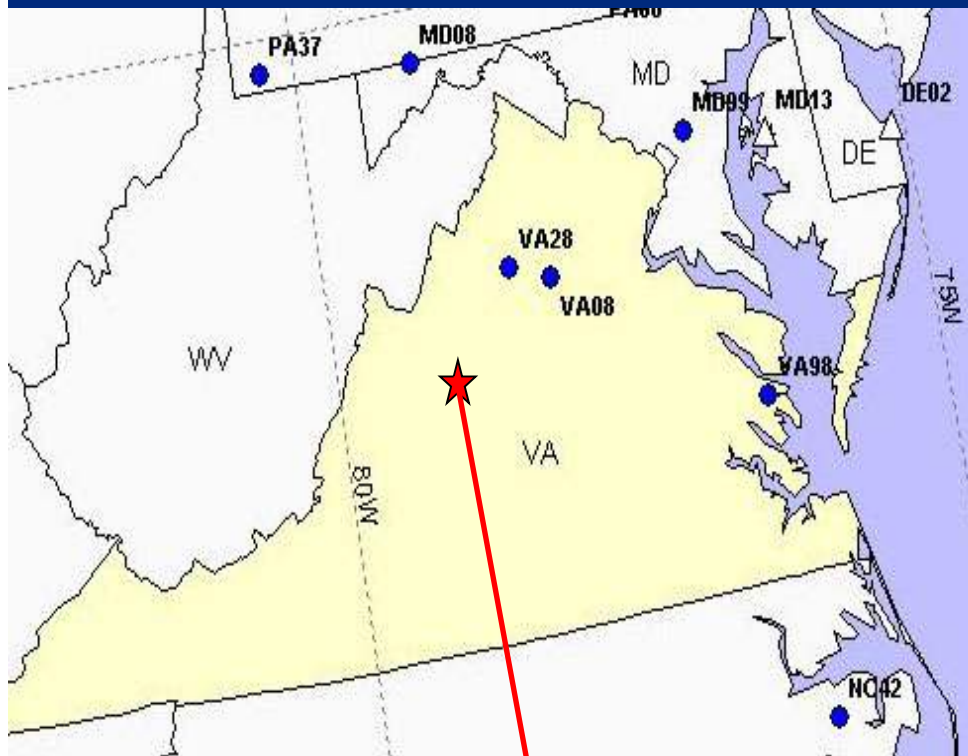


Mass Balance of Total Mercury

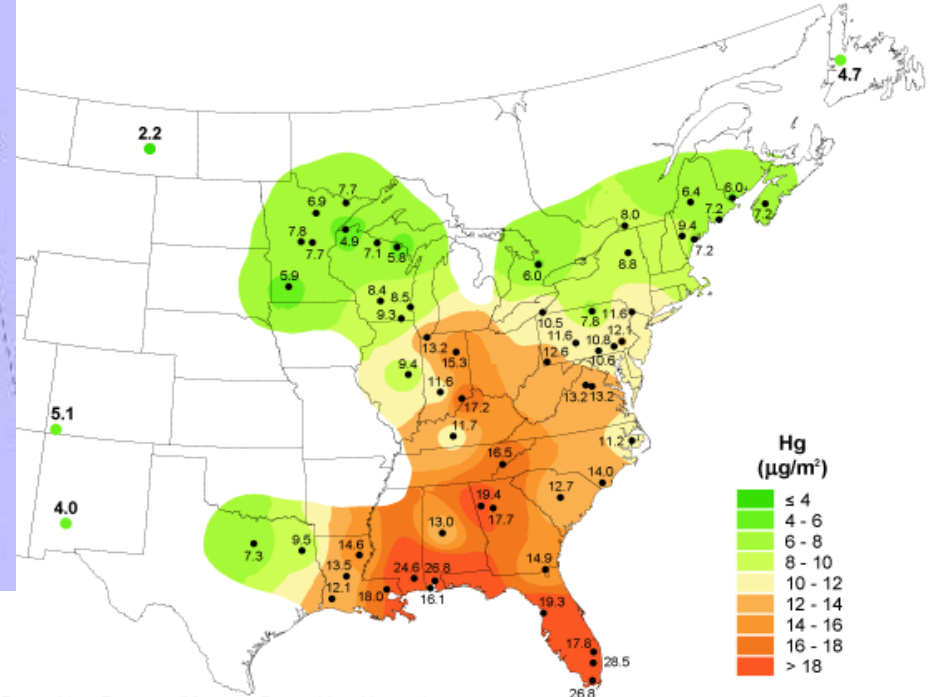


Atmospheric Deposition of Hg

Estimates from EPA's Mercury Dep. Network



Total Mercury Wet Deposition, 2003



National Atmospheric Deposition Program/Mercury Deposition Network

Wet deposition rate = $13.2 \mu\text{g}/\text{m}^2/\text{yr}$

Atmospheric Deposition of Hg

Wet deposition rate	= 13.2 mg/m ² /yr
Watershed Area (Harriston shed)	= 212 sq miles
Watershed Wet Deposition of Hg	= 7.2 kg/yr

Dry Deposition?

no good numbers currently in hand

1997 Mercury Report to Congress suggests	~6.8 mg/m ² /yr
Watershed Dry Deposition of Hg	= 3.7 kg/yr

Total Atmospheric Deposition	= 11.0 kg/yr
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How much of this gets into the stream system?

10%

50%

90%

Recent Monitoring

Continuous Monitoring

Flow, pH, Temp, SC, and Turbidity

- Ongoing at Waynesboro, Doms, and Harriston

Periodic Monitoring

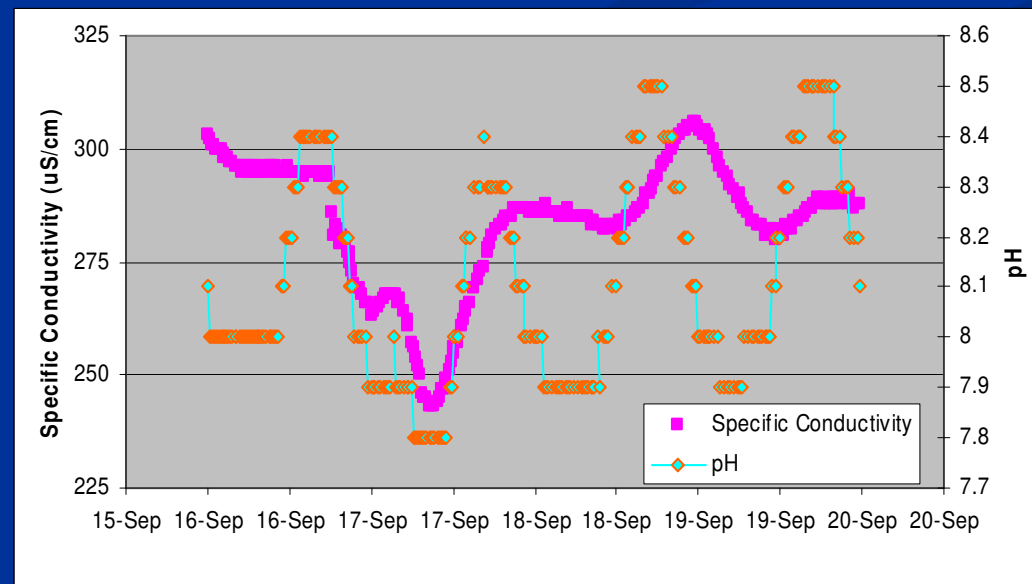
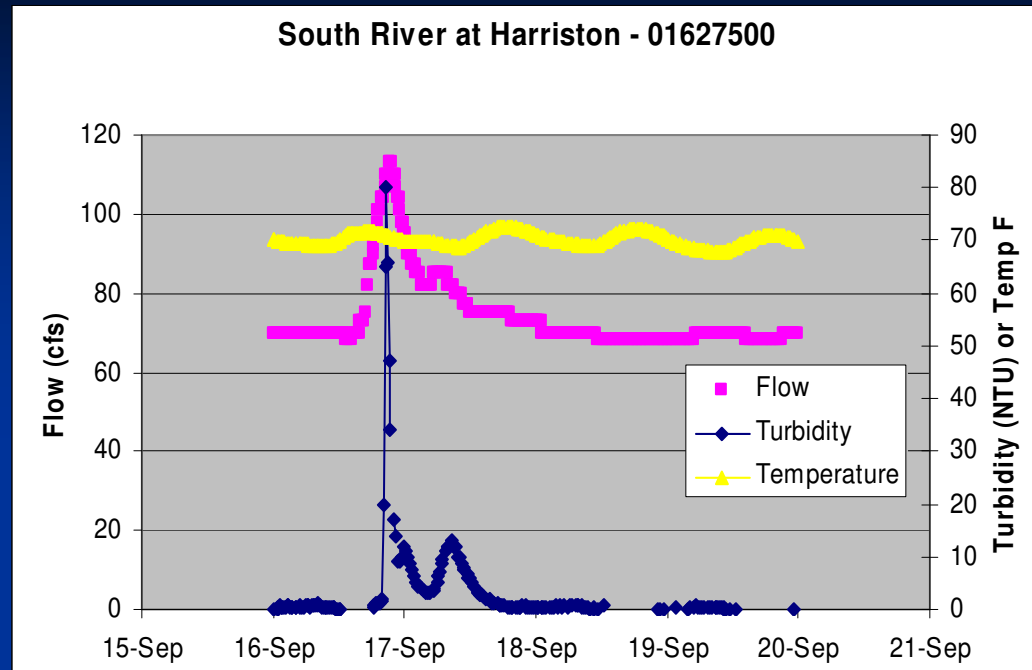
Tot Hg & MeHg (Diss. & Particulate)
DOC, Sulfate, Chloride, TSS

- Monthly baseflow samplings
- Storm Event : Oct 7-8
- Cross-stream sampling
- Interagency concurrent sampling

South River at Harriston, VA

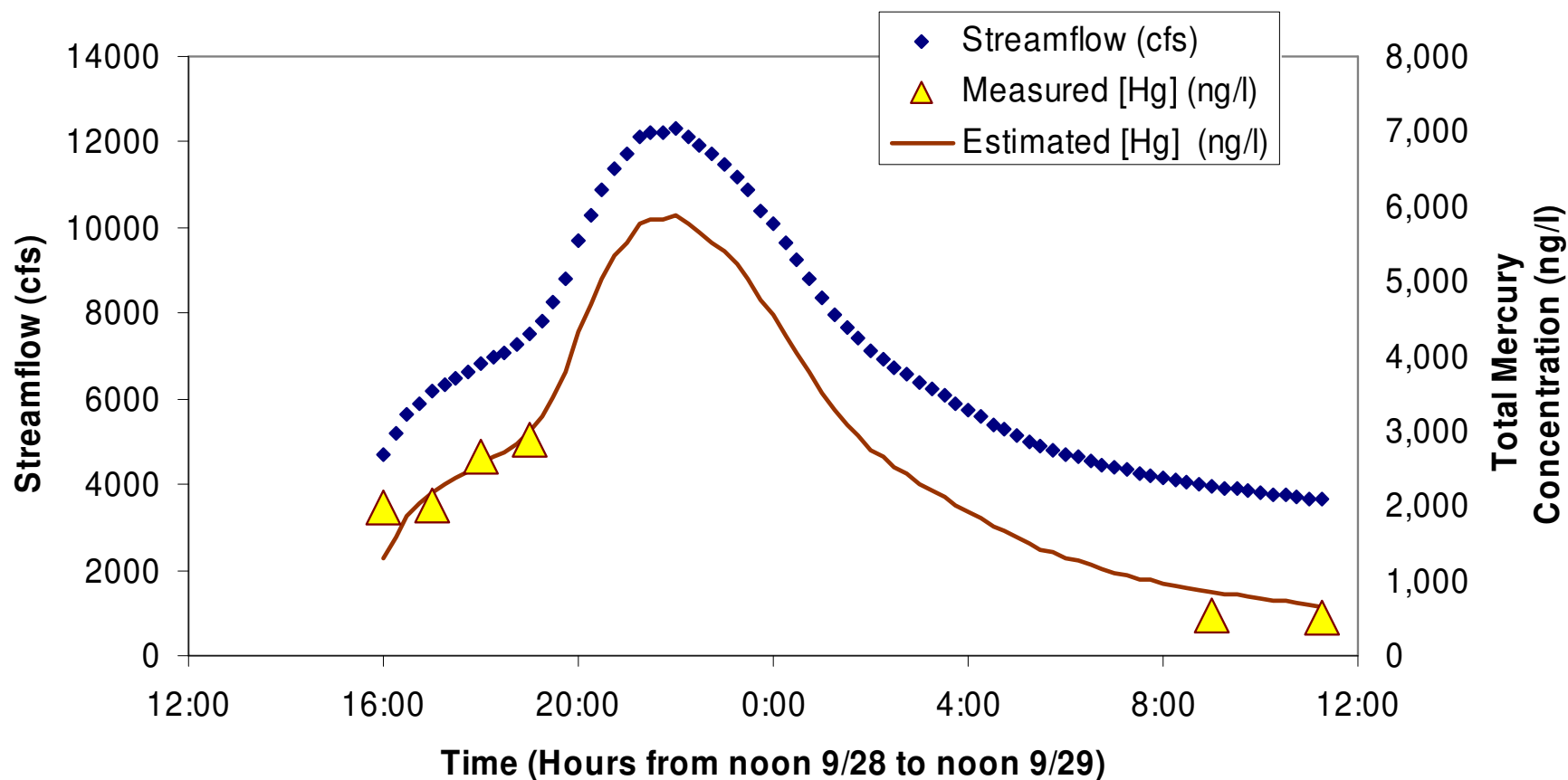


Example Continuous Monitoring Data



Mercury Flux, Hurricane Jeanne

Hurricane Jeanne - September 28, 2004
Streamflow and Mercury Concentrations at Harriston



Total Mercury Flux

Current (10/2005) Guesses for Watershed

Inputs (kg/year)

Net Atmospheric Deposition Wet+Dry	+11
assume watershed storage	-6
Dupont Plant continuing source	+~1

Outputs (kg/year)

River Discharge	-100
Volatilization & Evasion	-1
Total	-95

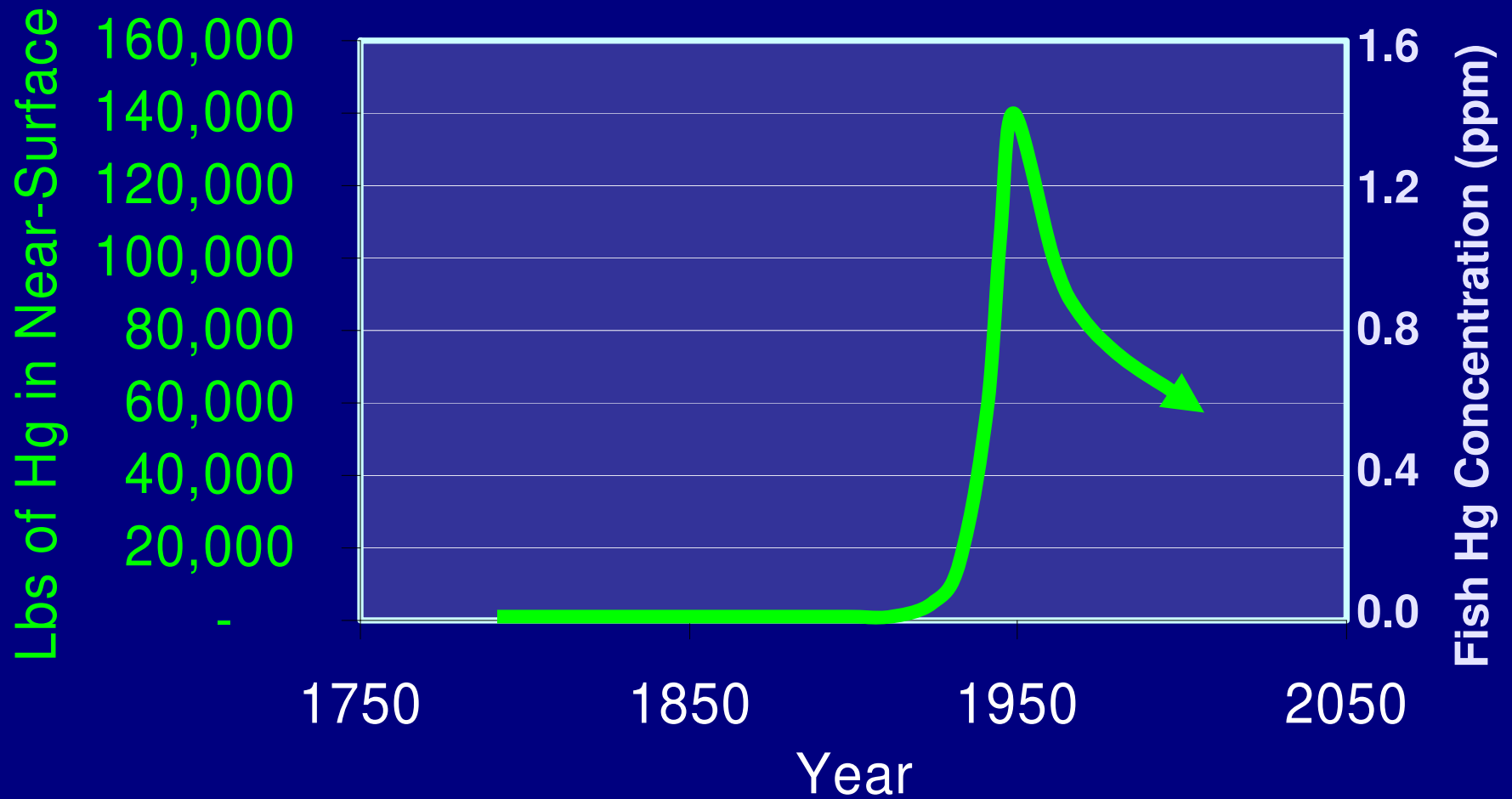
Mercury Concentrations

Preliminary Results:

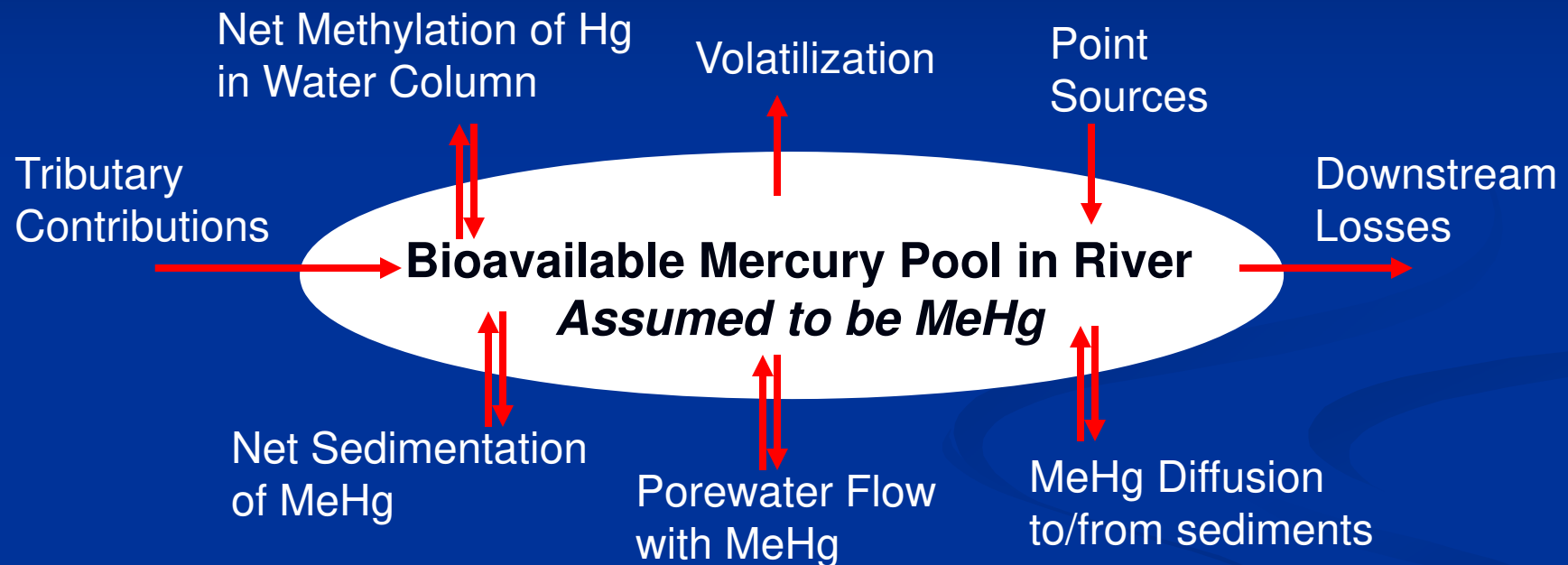
Dissolved Total Hg

- QA/QC - Blanks are yielding low concentrations 👍
- Dissolved THg increases going downstream from Waynesboro to Harriston
- Particulate [THg] range: <0.1 to 290 (ng/L)

Hypothetical Mercury Mass History



Mass Balance of Methyl-Mercury



More to Come . . .

South River Area

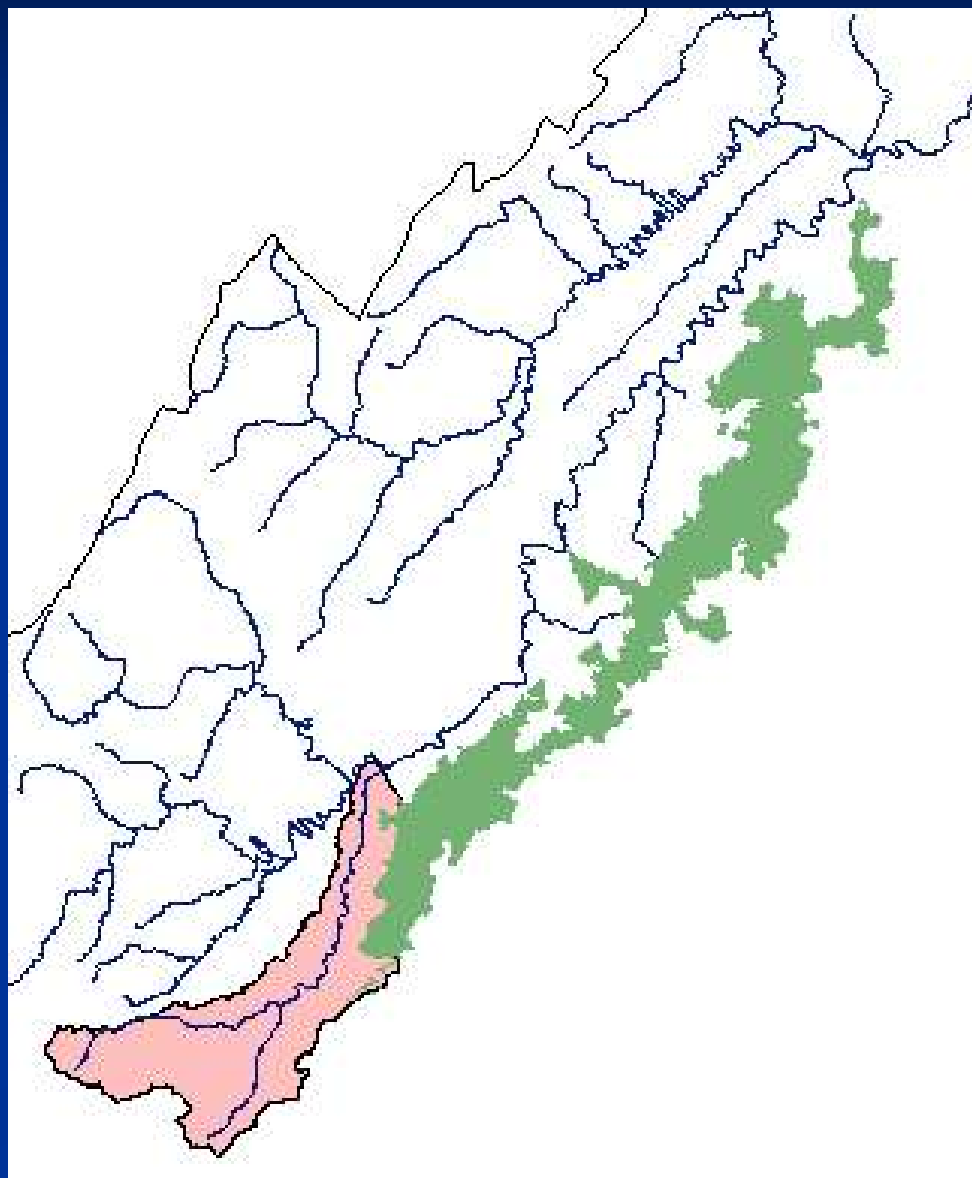
What are fish tissue mercury concentrations in nearby streams unaffected by Dupont mercury?

A number could be used as a bottom extrapolation point in determining needed Hg load reductions.

UVA-SWAS / USGS Study

Jack Cosby
Rick Webb
Chris Moore
Craig Snyder

Sampling fish in Shen Nat Park



South River Land Use

