

Plans for Cooperative Potomac Research

*Presentation to
Regional Monitoring Subcommittee
April 26, 2013*

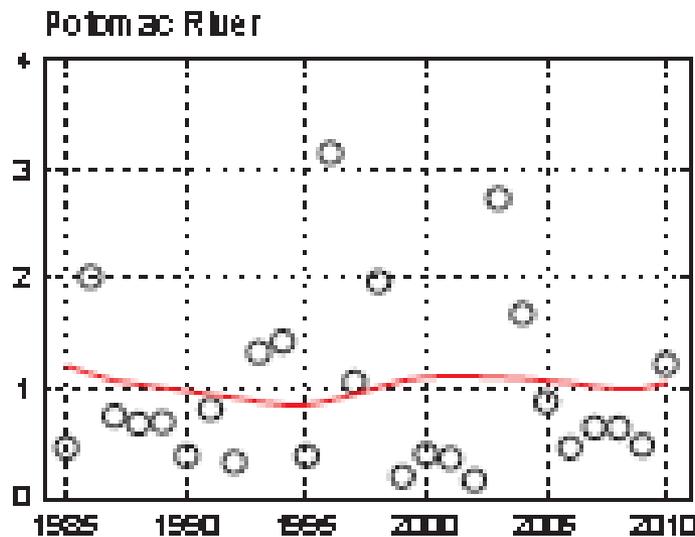


Metropolitan Washington
Council of Governments

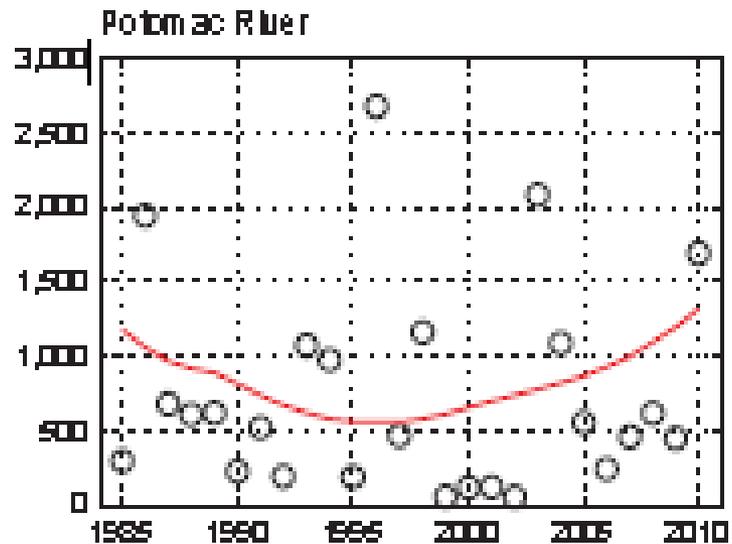
New USGS data on flow-normalized loads (WRTDS) raises questions about our understanding of what's going on in Bay watershed (including Potomac)

- For period of study, 1985 – 2010, many loads (particularly TP and TSS) appear to be increasing, not decreasing
 - Contrary to watershed model estimates
 - Also different than some flow-adjusted concentration trends
- Worsening trends appear to be accelerating
 - Either less progress (TN) or increasingly higher load increases (TP, TSS) for 2000-2010 period than for overall 1985-2010
- Nutrient species related to wastewater discharges (nitrate, orthophosphate) do show improving trends for both 1985-2010 and 2000-2010 periods, consistent with management actions

Some WRTDS Results for Potomac



Flow adjusted trends for TP yield: 12.4% decrease from 1985 – 2010; 5 % decrease from 2000 - 2010



Flow adjusted trends for TSS yield: 12.2% increase from 1985 – 2010; 89.1 % increase from 2000-2010

Further Investigations

- USGS working with Bay Program modeling team to investigate modeling and monitoring results
 - Potomac watershed to be a focus (9 USGS water quality monitoring stations upriver from fall line)
 - Looking for data to isolate possible source and geographic signals
- COG finalizing contract with OWML for additional Potomac water quality analysis
 - Develop load profile for the Potomac using OWML's Chain Bridge data
 - Check accuracy of USGS flow-adjusted loads for the Potomac
 - Provide seasonal trend estimates for nutrient species important to upper estuary water quality
 - Participate in USGS-CBPO Potomac investigations

FRAMEWORK FOR WATERSHED TREND EXPLANATION

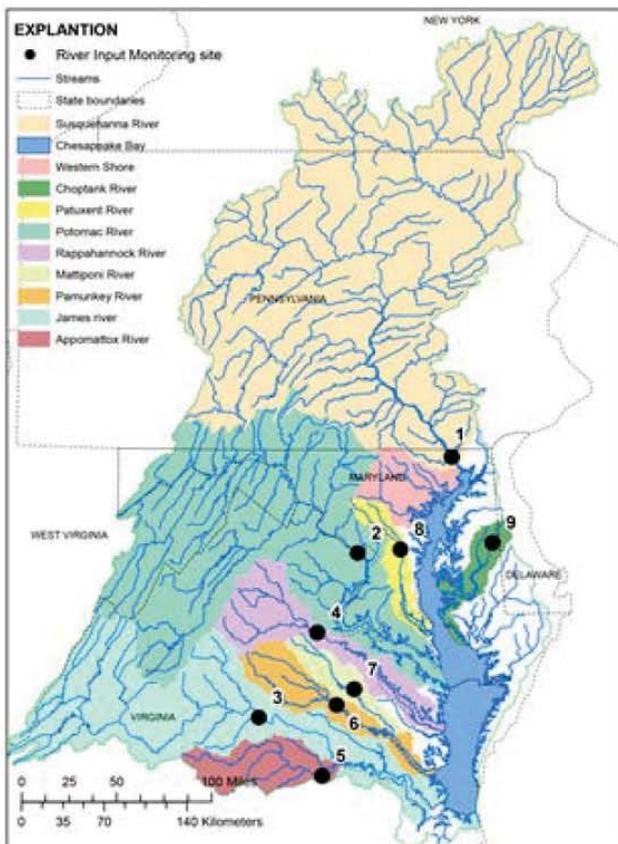
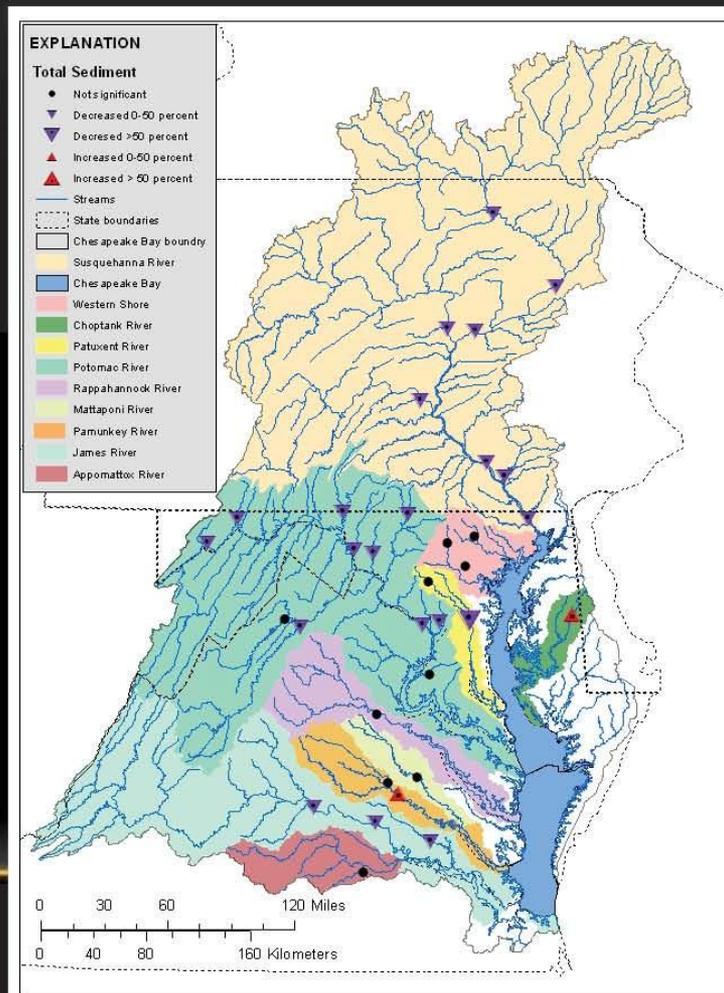


Figure 1. Map showing the location of the 9 River Input Monitoring (RIM) systems in the Chesapeake Bay watershed.



USGS Project Goals

- Describe the changes in riverine water quality and mass transport over the past three decades.
- Describe changes in watershed condition over historic and recent time periods.
- Explain the observed changes in relation to land cover, land use, restoration actions, source controls, and hydrologic and geomorphic controls
- Evaluate and improve our ability to model historic changes in mass transport in order to improve our ability to predict future conditions.
- Provide insight into management action effectiveness in order to better manage in the future.
- Demonstrate a clear link among watershed condition, stream quality, and estuarine response.
- Improve our ability to model changes in estuarine condition relative to water quality inputs

Components of Watershed Assessments

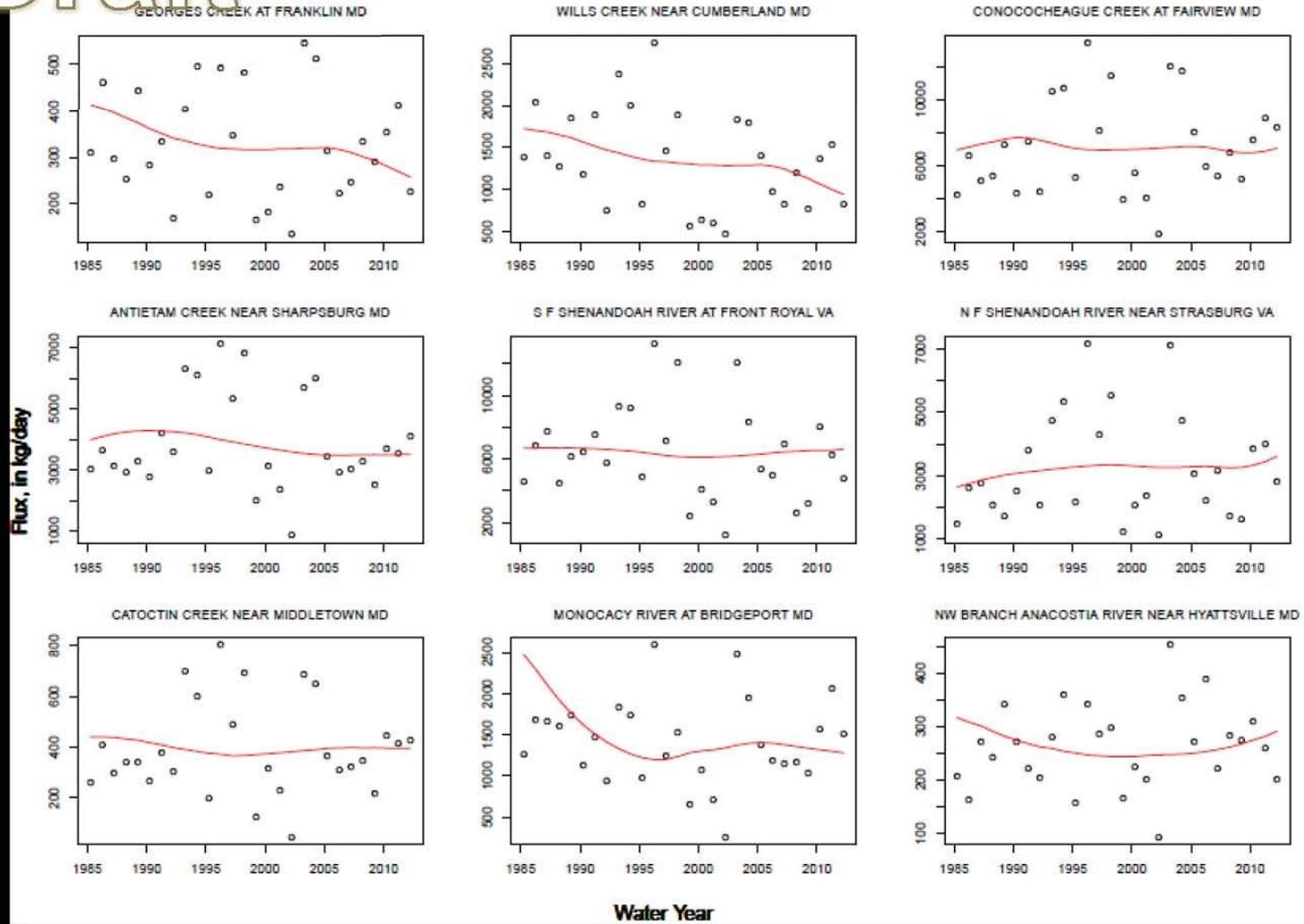
- Stream Monitoring Results
- Land Cover Change products
- Population Change (census)
- WSM (input, output, assumptions)
- SPARROW (multiple models and tools)
- Groundwater Models
- Wastewater practices / change
- Land change forecasts / hindcast
- Ag production (CEEP/NASS)
- Ag practice data (CBP/USDA)
- Small watershed studies of hydrologic processes
- Literature

Notes on Models and Model Evaluation

- Models set our expectations for the response of a stream to changes in the watershed
- Where models and monitoring agree, we may (at some risk) conclude that the model sufficiently describes temporal variations such that:
 - We can use the model components to describe factors affecting change
- Where models and monitoring disagree, additional evaluation is required before model data can be used as explanatory data.
 - Incorrect data or assumptions
 - Lag time unaccounted for?
 - Processes inappropriately incorporated

Draft

Potomac Tributary Fluxes, Total N



Draft

Potomac Tributary Fluxes, Ortho-P

