CBP Watershed Model Upgrades

Presentation to
Water Resources Technical Committee
June 7, 2011

Metropolitan Washington
Council of Governments

Today's Focus

- Watershed model update schedule and new developments
- Potential sediment issues

- Next Steps – input on future direction of modelling analysis efforts
  - Continue focus on output only or try to peer into "black box"

CBP Watershed Model Schedule

- Currently finalizing calibration of Phase 5.3.2
- June 30 – EPA issues 5.3.2 scenarios (MD finalizes MAST)
- July 15 -- EPA issues new state/major basin allocations
  - August 15 – MD issues county-level target
  - VA - ?
- July – MD conducts MAST training sessions
- August /Sept.– EPA conducts Scenario Builder workshops; issues its version of MAST (CAST)

What is MAST (CAST)

- Maryland Assessment and Scenario Tool (successor to Vortex, COAST)
- Online means of deriving nutrient and sediment load estimates that are consistent with watershed model
- Two main uses
  - Directly estimate loads from different scenarios (close approximation of actual model output)
  - Export files for input into CBP modeling system (via state gatekeepers)
- Developed by ICPRB and J7 for Maryland; Bay Program will tweak to come up with Chesapeake Assessment and Scenario Tool

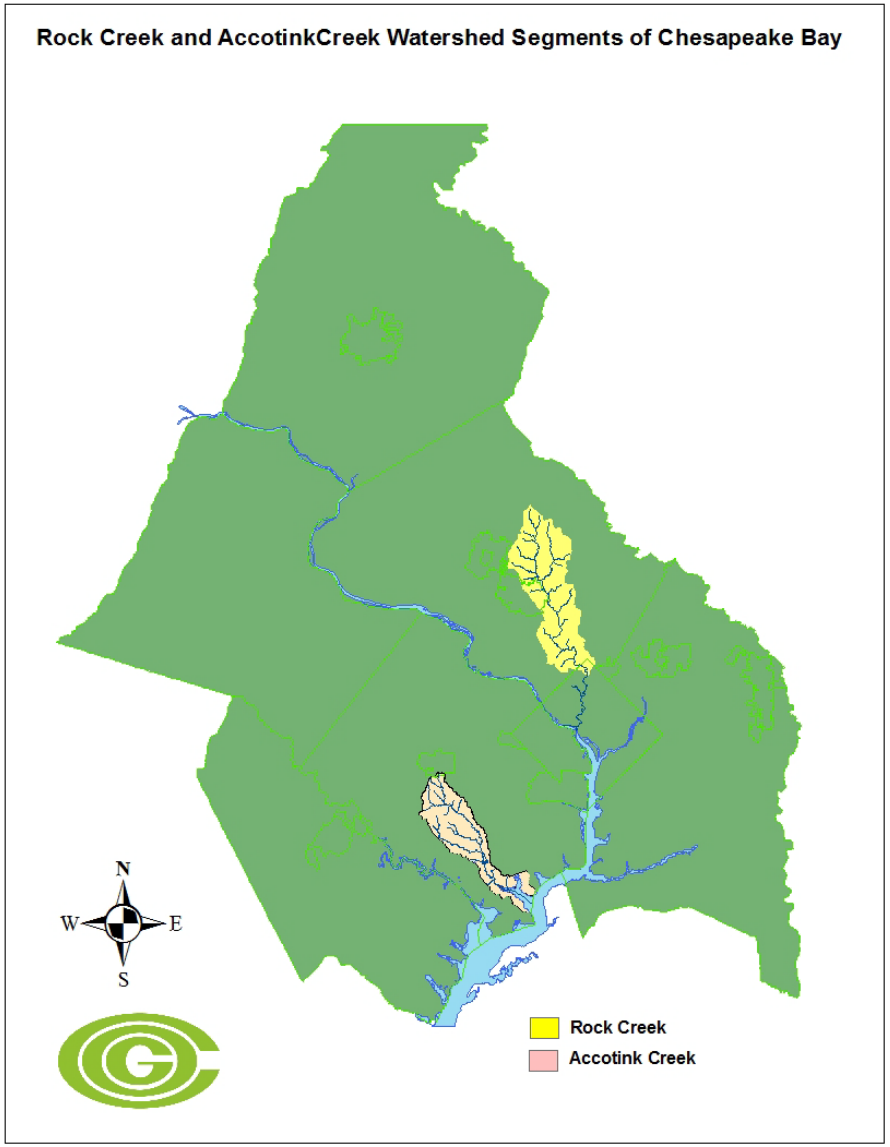
Are sediment loads an issue?

Target Load/Source[1]	Total Nitrogen (% reduction required from 2009 progress loads)	Total Phosphorus (% reduction required from 2009 progress loads)	Total Sediment (% reduction required from 2009 progress loads)
Frederick County (MD)*	18.5	31.3	?
Montgomery County (MD)*	16.1	36.0	?
Prince George's County (MD)*	9.8	31.6	?
Virginia Potomac basin**	8	14	21

* Derived from MDE's "Summary of Maryland's Phase I Watershed Implementation Plan Target Loads"
** Derived from VAMSA presentation of 03/29/2011 by Ed Cronin, Greeley & Hanson

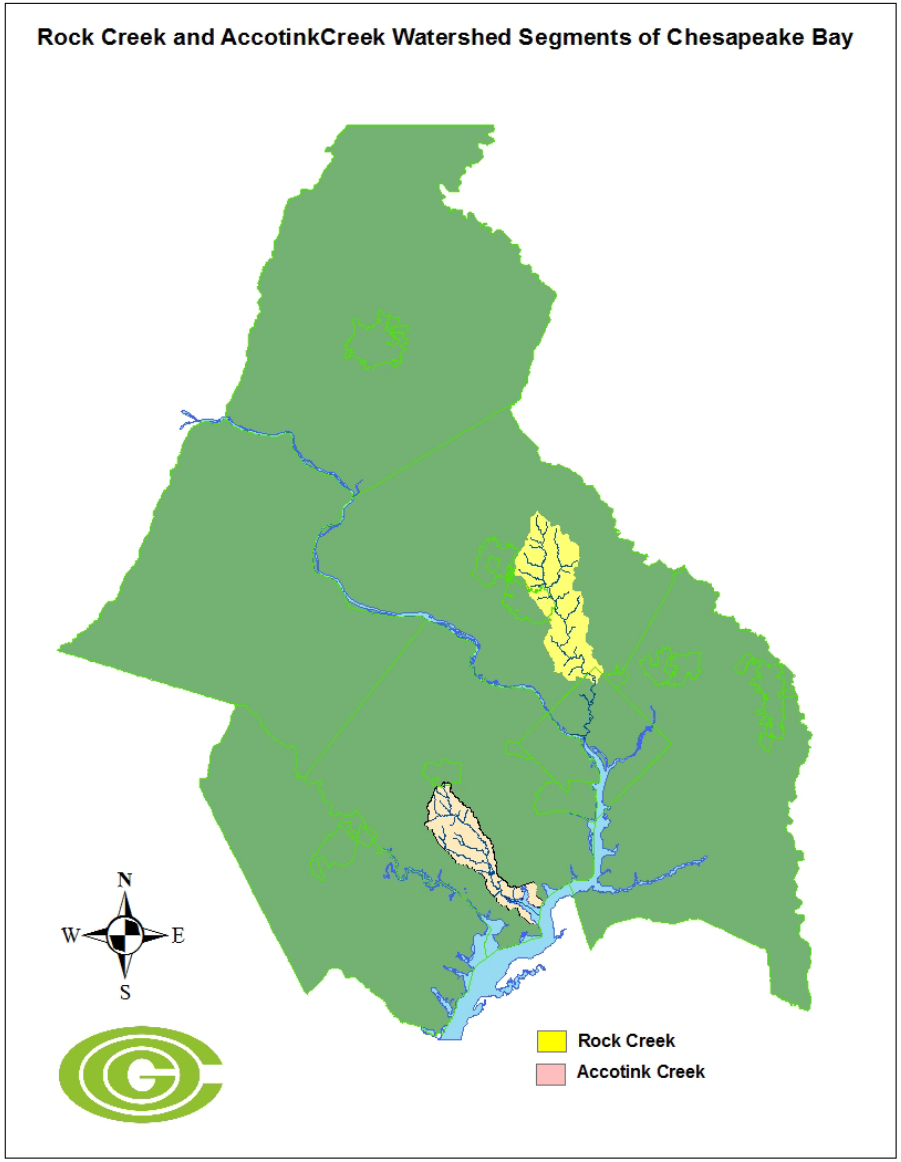
Sediment load comparisons

- Series of slides comparing:
  - Phase 5.2 to 5.3 loads
  - Accotink Creek (VA) to Rock Creek (MD) (single land-river WSM segments)
  - Similar urban-dominated watersheds
  - Urban land uses account for app. 90 % of total sediment loads

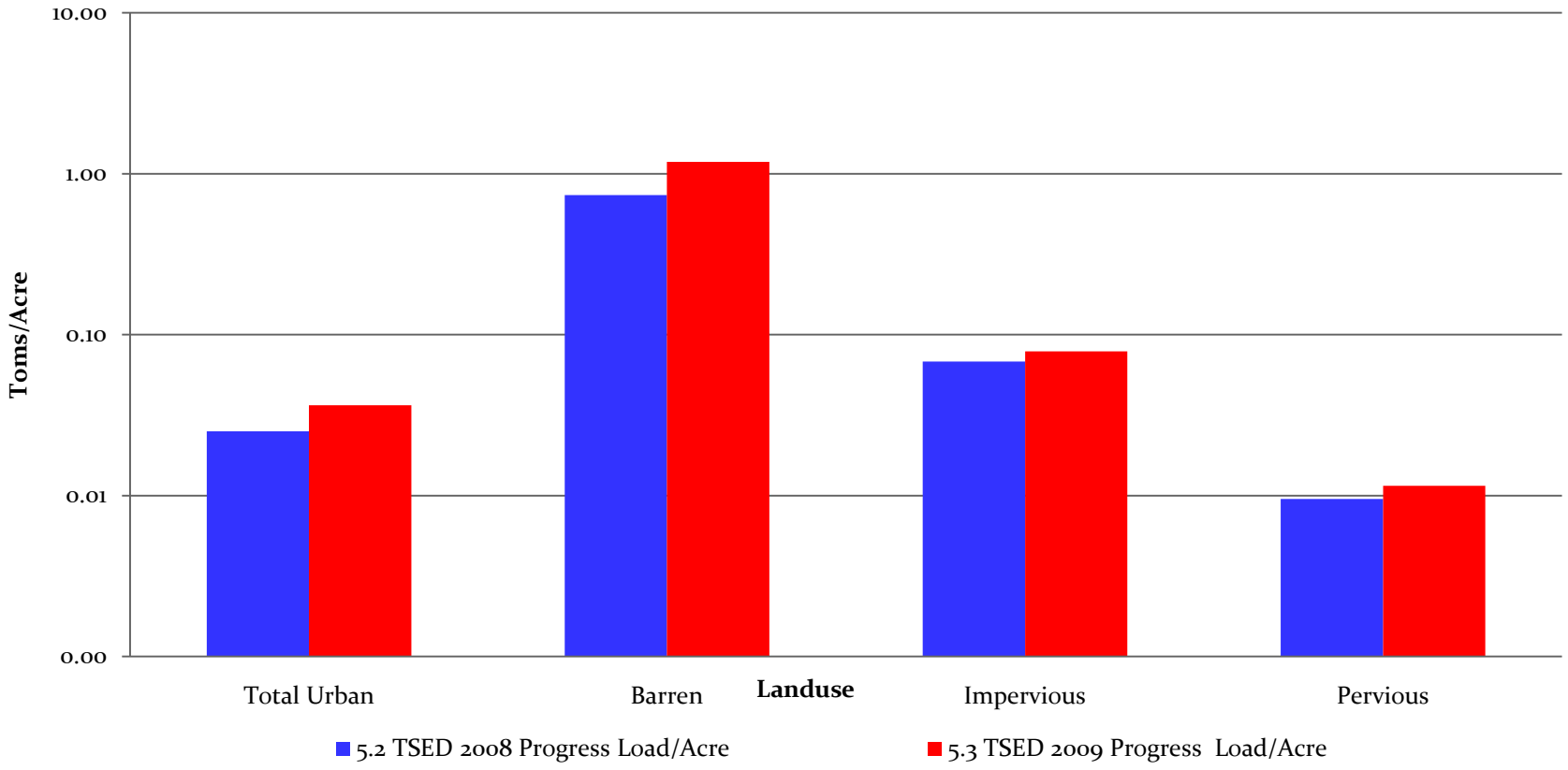


Sediment load comparisons

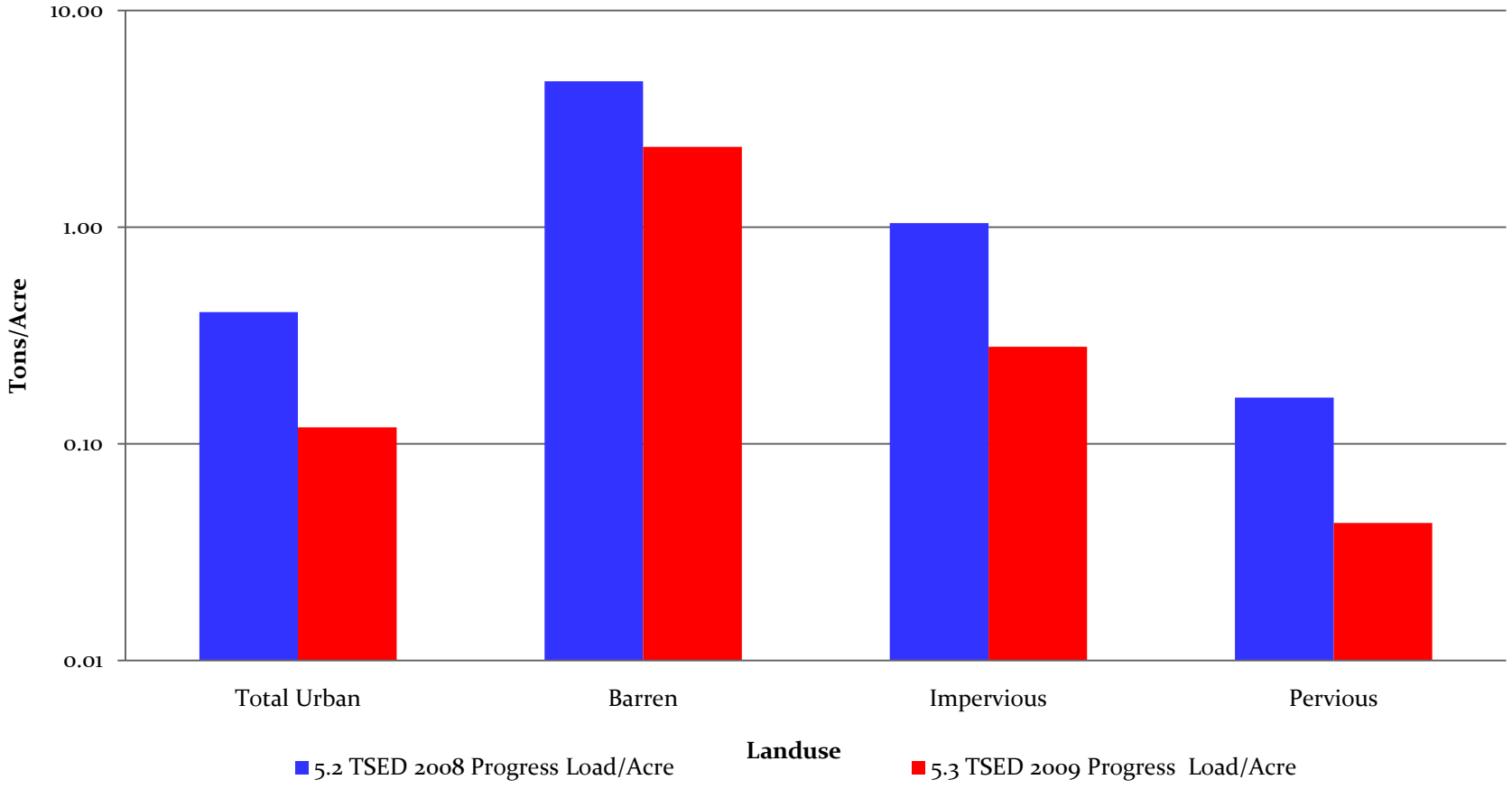
- Slides show <u>delivered loads/acre</u> (to adjust for differences in acreages) in 4 categories:
  - Total urban
  - Impervious urban
  - Pervious urban
  - Barren (land under construction)
- all log-scale plots



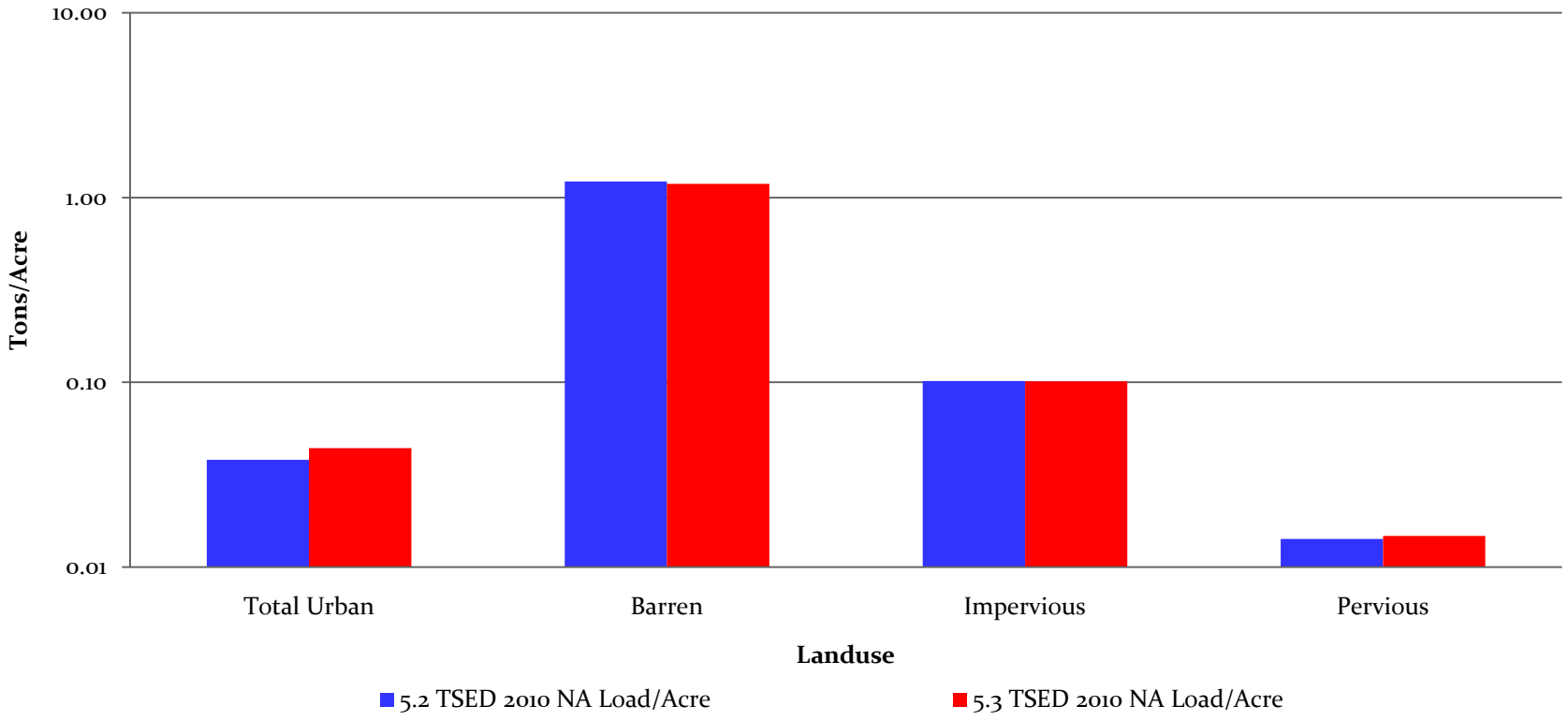
Accotink Creek Total Sediment Load (Tons/Acre)
Phase 5.2 (2008 Progress) vs. Phase 5.3 (2009 Progress)



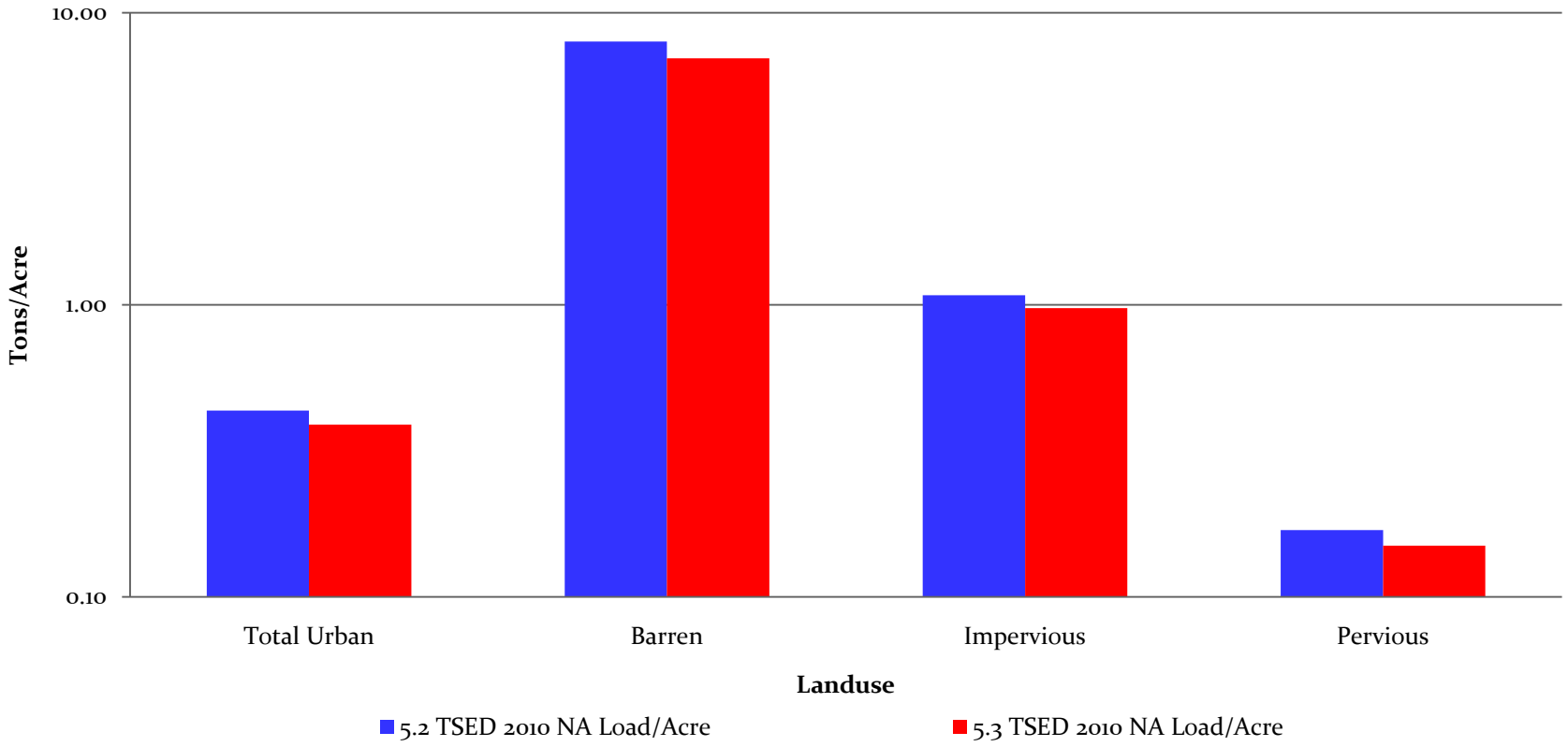
Rock Creek Total Sediment Load (Tons/Acre)
Phase 5.2 (2008 Progress) vs. Phase 5.3 (2009 Progress)



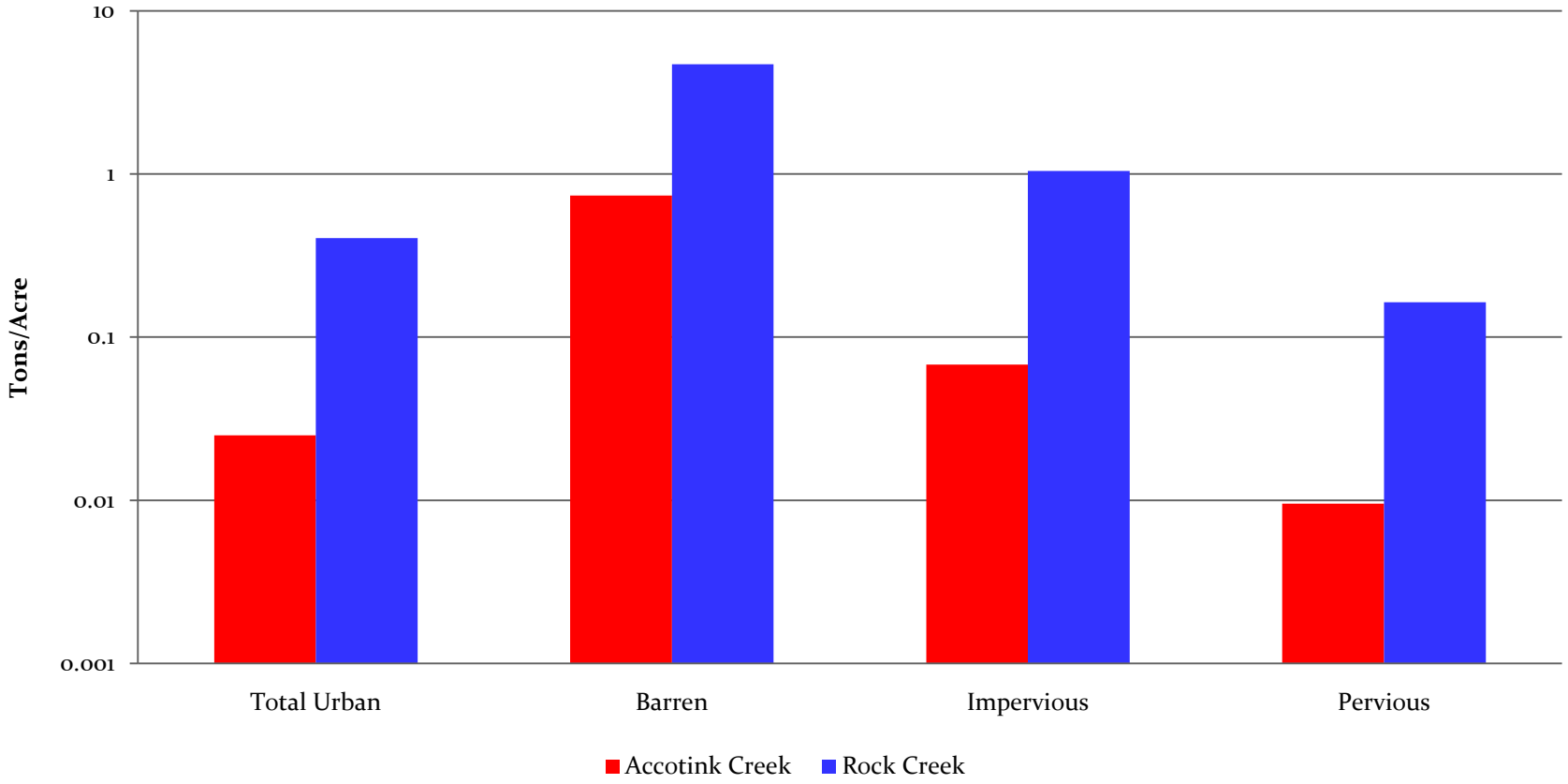
Accotink Creek Total Sediment Load (Tons/Acre)
Phase 5.2 (2010 No Action) vs. Phase 5.3 (2010 No Action)



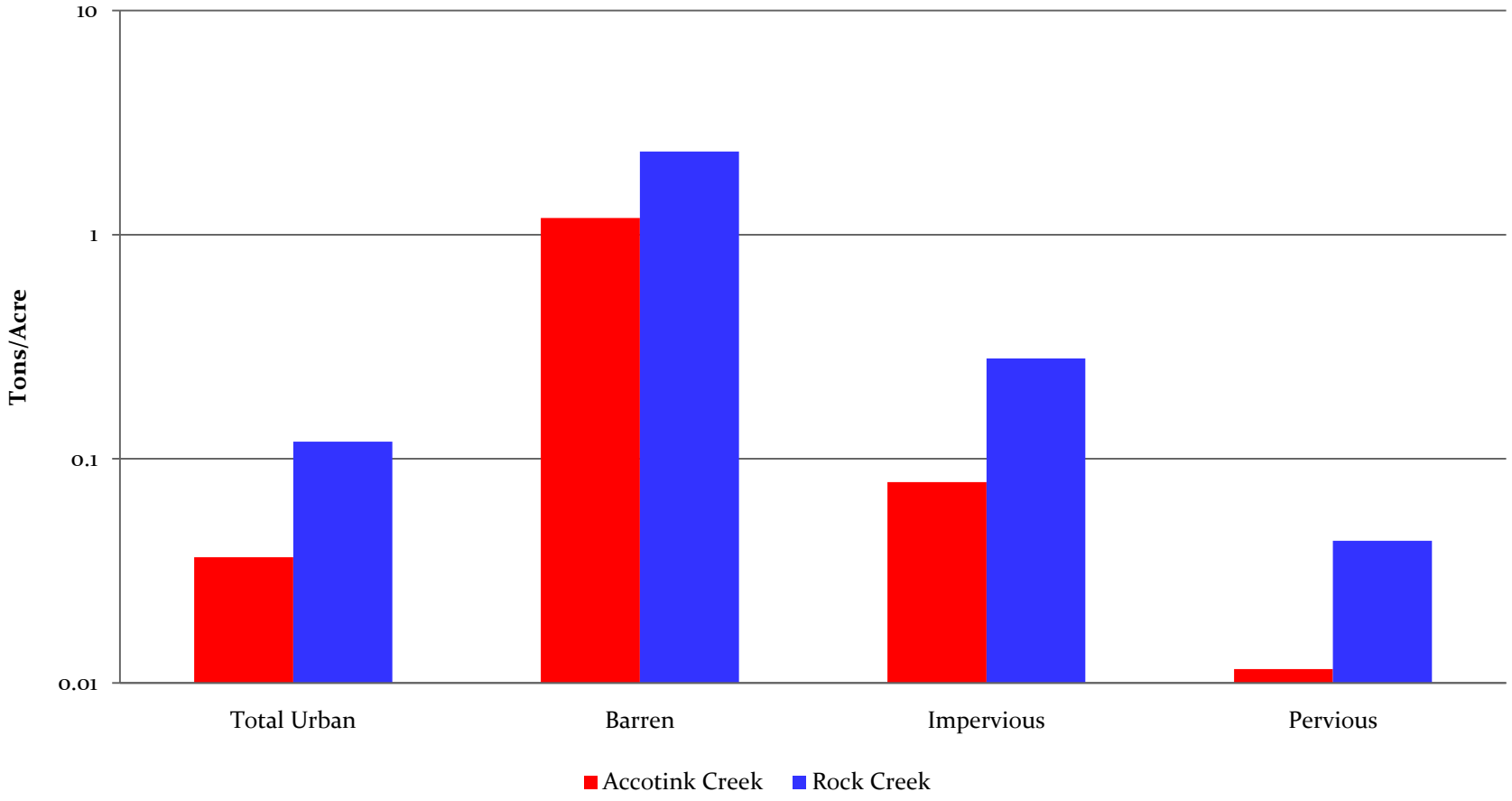
Rock Creek Total Sediment Load (Tons/Acre)
Phase 5.2 (2010 No Action) vs. Phase 5.3 (2010 No Action)



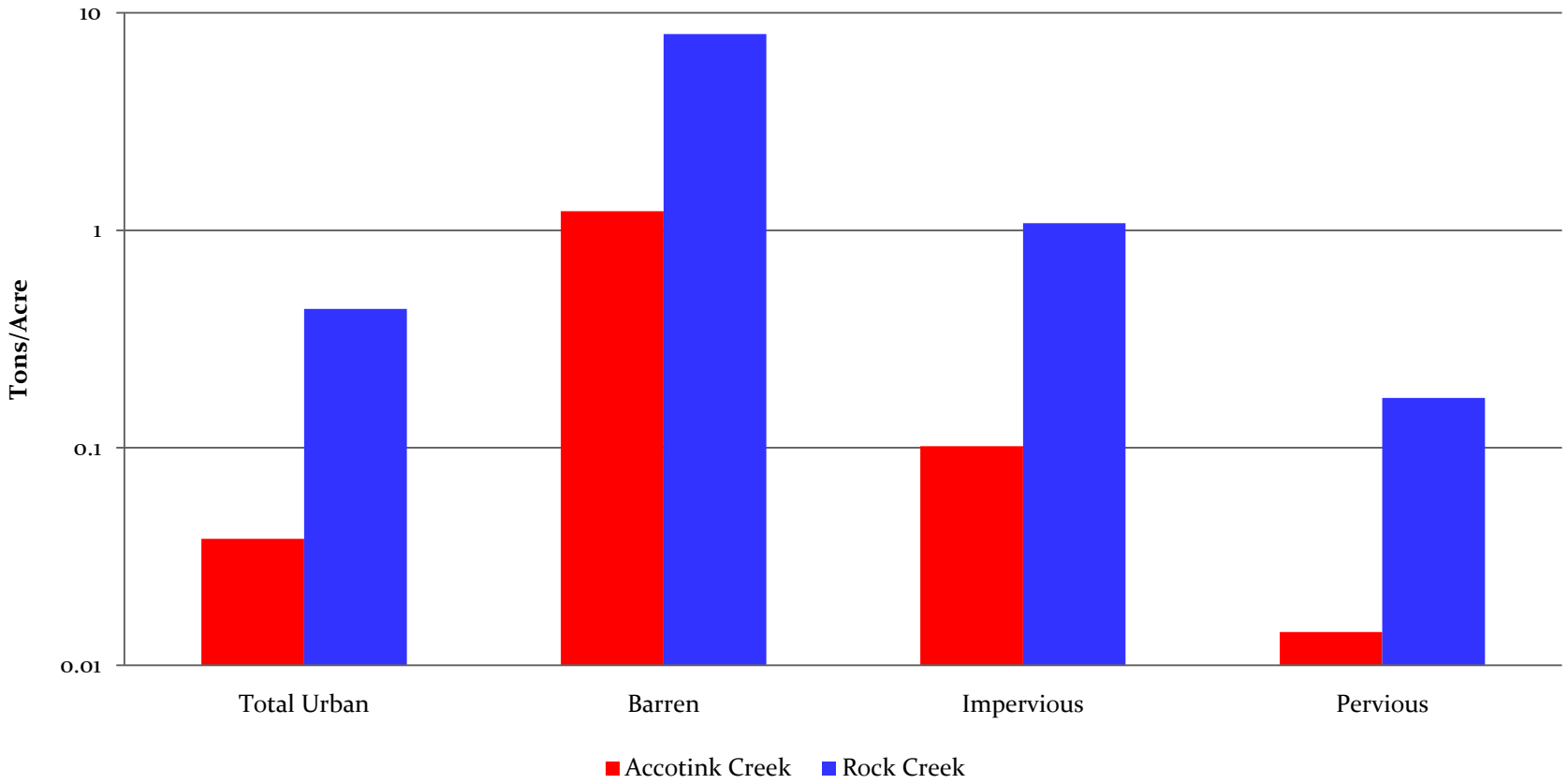
Phase 5.2: 2008 Progress Total Sediment Load (Tons/ Acre)
Accotink Creek vs. Rock Creek



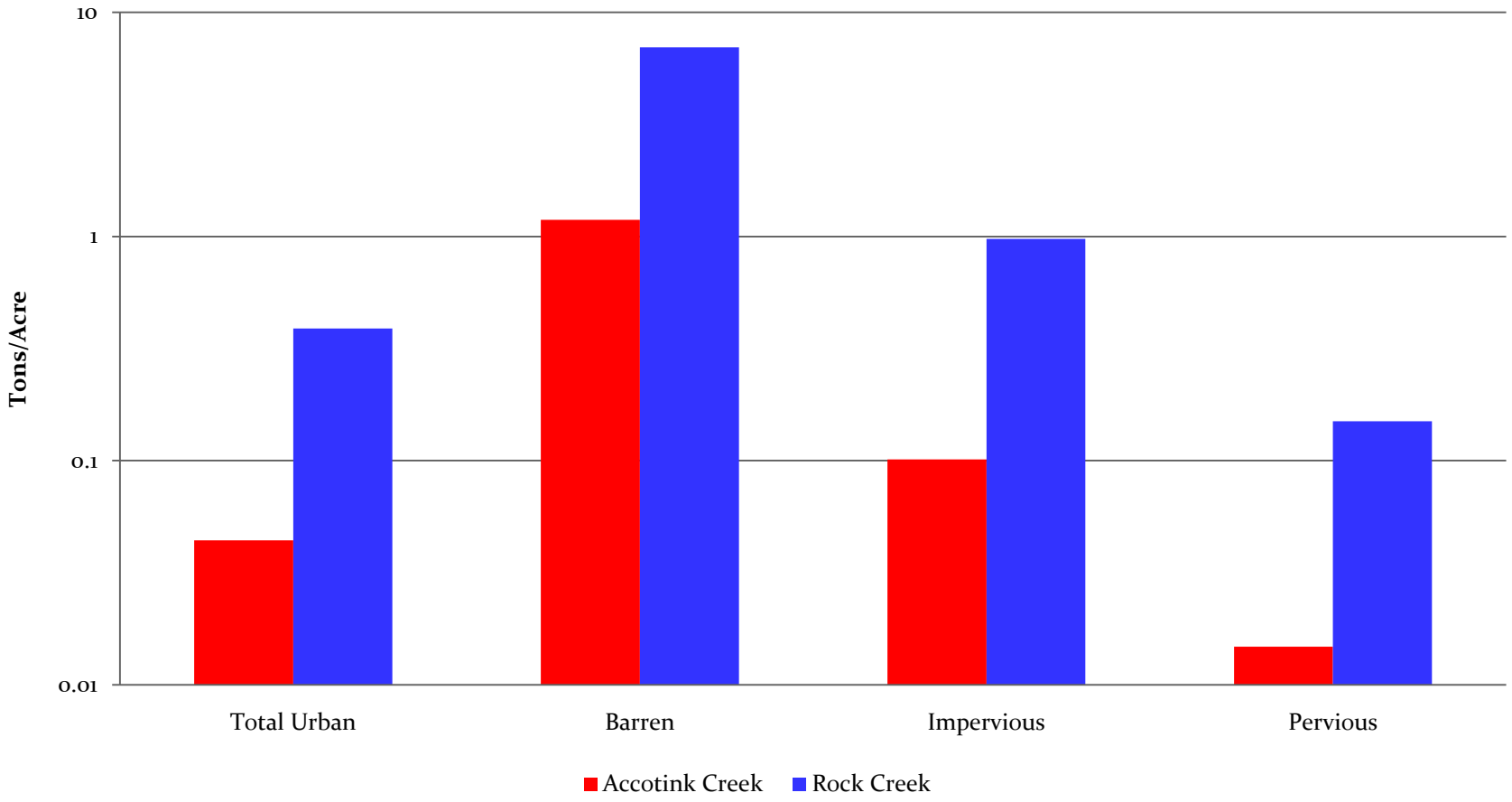
Phase 5.3: 2009 Progress Total Sediment Load (Tons/ Acre)
Accotink Creek vs. Rock Creek



Phase 5.2: 2010 No Action Total Sediment Load (Tons/ Acre)
Accotink Creek vs. Rock Creek



Phase 5.3: 2010 No Action Total Sediment Load(Tons/ Acre)
Accotink Creek vs. Rock Creek



Sediment Wrapup

- Appear to be issues at local segment level with earlier versions of sediment loads
  - Phase 5.3.2 - ?
  - Do sediment allocations matter or do they "fall out" from achievement of urban P allocations?

For more information:

ftp://ftp.chesapeakebay.net/

Next Steps

- Where should COG focus its watershed model analysis efforts?
  - Effort to date has examined model output, not model processing

<u>3 main possibilities</u>

- Interest in MAST/CAST scenario analysis work?
- Examination of target load decisions?
- Interest in outside modelling analysis capability?
  - Limno-Tech work on water quality model/criteria development may be precedent