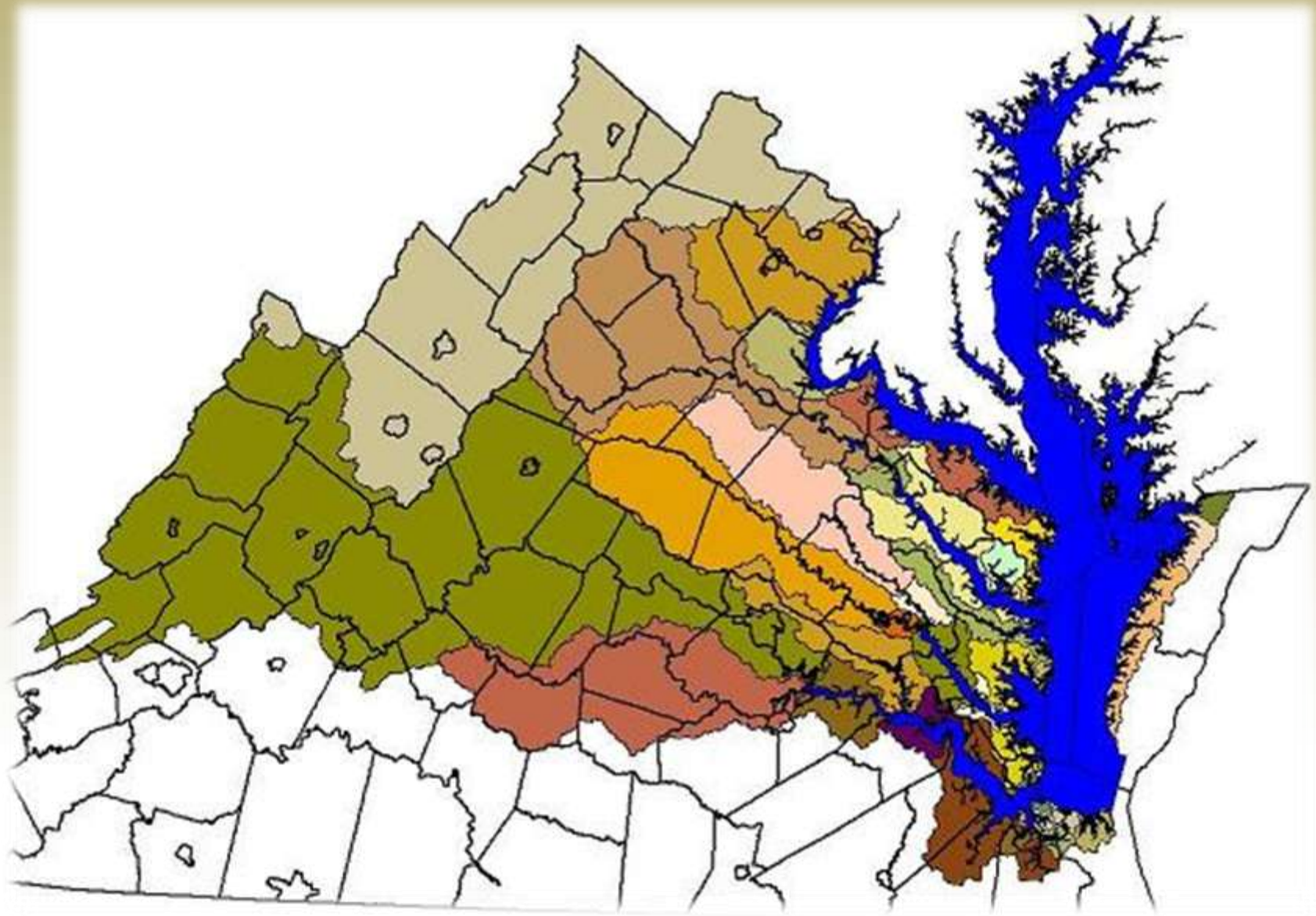
Chesapeake Bay TMDL

- An overview of the program

Chesapeake Bay Watershed

Virginia Chesapeake Bay Drainage Segments



What is a TMDL?

- TMDL - **T**otal **M**aximum **D**aily **L**oad
  - Maximum amount of a pollutant allowed to enter a waterbody by law so that the waterbody will meet and continue to meet the water quality standards for that particular pollutant.
  - Pollutants are anything that prevents a waterbody from attaining the national goal of being "fishable and swimmable.“
  - EPA sets allocations (lbs/yr) for each basin segment in the Bay

More on TMDL

- Pollutant quantity is the sum of the individual wasteload allocations (WLAs) for
  - Point sources (e.g., sewage treatment plant and industrial discharges)
  - Load allocations (LAs) for nonpoint sources (e.g., pollutants carried by rainfall runoff from forests, agricultural lands, and abandoned mine lands)
  - Natural background levels
  - Safety factor to maintain the integrity of the water sources (margin of safety (MOS)).

How Are TMDLs Developed?

- Accepted mathematical methods that represent what is happening in nature are used to develop the TMDL.
  - Computer-based models, such as EPA's BASINS or EPA Region 3's MDAS, are used for the more complex situations to predict how certain pollutants behave in the waterbody.
  - A GIS (geographic information system) may also be used to provide the framework for the model's information, such as land use distributions and the locations of flow gages and water quality monitoring stations.
  - Data and information may include the relative contribution of various point and nonpoint sources of pollution in the watershed.
- All of this information is then used to develop and propose a TMDL that is appropriate for the specific waterbody.

Other Definitions

- Allocation
  - Limit of pounds of nutrients or sediment that can be discharged annually
- Sector
  - Source of discharge to the Bay including wastewater facilities and industries (point sources), agriculture, stormwater, septic tanks, atmospheric deposition
- WIP: Watershed Implementation Plan
  - Virginia sets allocations for each sector and individual significant point sources
    - Note: significant point sources are above 40,000 gpd

TMDL History

- Law suits with EPA settled in 1999 requiring final TMDL by May, 2011
- Tributary Strategies completed in 2005 as well as new water quality standards for the Bay
  - Trib Strat consists of allocations for significant point source discharges and other sectors
- Point source allocations established in late 2005, compliance due in 2011
- Nutrient Credit Exchange Program also established in 2005
  - Exchange designed to facilitate buying/selling nutrient credits amongst members, which are only point sources
- EPA and states begin developing TMDL in 2007
- EPA sets basin allocations in August, 2010
  - Virginia formed Stakeholder Advisory Group in 2010 to provide input on the WIP

TMDL History

- Draft VA WIP submitted to EPA on Sept 3rd
  - EPA has reviewed the WIP and provided comments to VA on necessary changes
  - EPA “Not Happy”
- EPA TMDL published Sept 24th
  - Public comments were due November 8th
  - York County submitted copy of HRPDC comments with cover letter
- VA must address EPA WIP concerns by Nov 29th
- EPA finalizes TMDL by Dec 31st
- 2011
  - **June 1** – VA submit draft Phase II Watershed Implementation Plans.
  - **November 1** - The states and the District submit their final Phase II Watershed Implementation Plans.
  - **December** - EPA modifies the Bay TMDL, if necessary.
  - **December 31, 2011** - The first set of two-year milestones is completed.

TMDL In Brief

- Designed to ensure that all pollution control measures to fully restore the Bay and its tidal rivers are in place by 2025
  - 60 percent of the actions completed by 2017.
- Draft Bay watershed limits
  - **Nitrogen** 187.4 million pounds per year
  - **Phosphorus** 12.5 million pounds per year
  - Range of allowable **sediment** pollution levels at between 6.1 and 6.7 billion pounds per year.
  - These pollution limits were further divided by jurisdiction and major river basin
    - EPA based on *"…state-of-the-art modeling tools, extensive monitoring data, peer-reviewed science, and close interaction with state partners"*

TMDL In Brief

- Federal backstop measures in the draft TMDL due to deficiencies in WIPs submitted by the states
  - Backstops are what worries VA – they are “worst case scenario” and therefore costly.

Table ES-1. Chesapeake Bay TMDL watershed nutrient and sediment draft allocations by jurisdiction and by major river basin [proposed standards]

Jurisdiction	Basin	Nitrogen draft allocations (million lbs/year)	Phosphorus draft allocations (million lbs/year)	Sediment draft allocations (million lbs/year)
Virginia	Eastern Shore	1.21	0.16	10.91
	Potomac	17.46	1.47	810.07
	Rappahannock	5.84	0.90	688.51
	York	5.41	0.54	107.09
	James	23.48	2.34	852.77
	VA Total	53.40	5.41	2,469.35

Virginia WIP

- Phase I WIP
  - 60% of allocations met by 2017 and 100% by 2025
- Phase 2 WIP
  - Divides all sector allocations among smaller geographic areas
  - Due to EPA by June 1, 2011
- Phase 3 WIP
  - Due in 2017
  - Refine actions and controls to achieve 100% goal in 2025
- Overall Plan Items:
  - Proposed broad expansion of nutrient credit exchange
  - Includes study of chlorophyll standard proposed by EPA for James River
- EPA Review of VA WIP
  - *"Serious deficiencies – Does not meet allocations for nitrogen (6 percent over) and phosphorus (7 percent over), but does meet allocations for sediment (12 percent under)."*

Backstop Summary

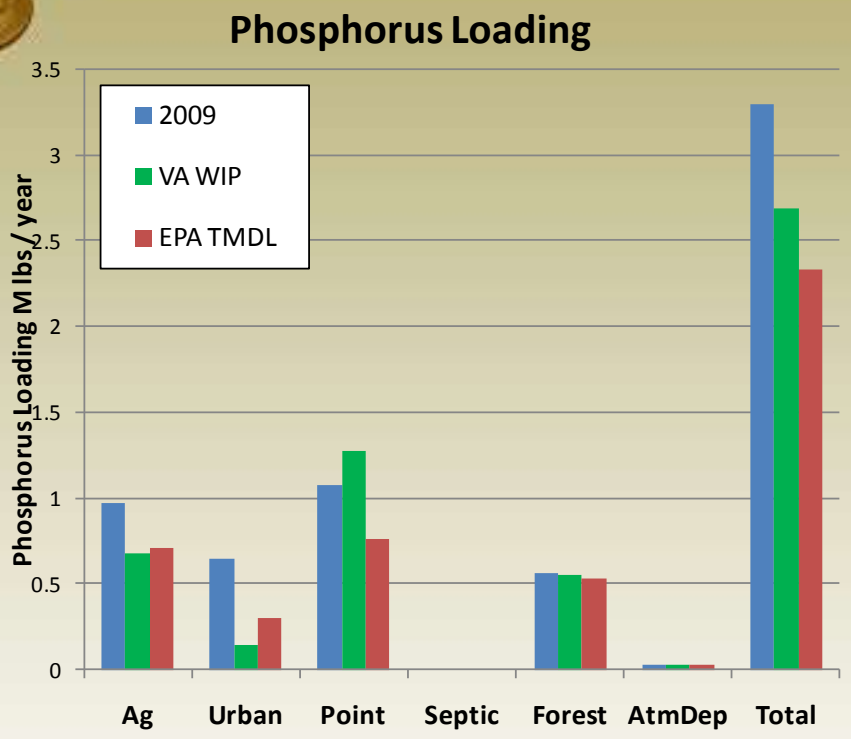
- **Virginia: Moderate-level backstop allocations for Virginia point sources**
- **Wastewater treatment plants:** 4 mg/L TN and .3 mg/L TP and design flow for significant municipal plants consistent with most aggressive WIP proposal
- **MS4s:** 50 percent of urban MS4 lands meet aggressive performance standard through **retrofit/ redevelopment**; 50 percent of unregulated **land treated as regulated**, so that 25 percent of unregulated land meets aggressive performance standard; designation as necessary.
- **Construction**: Erosion and sediment control on all lands subject to Construction General Permit.
- **CAFO production areas**: Waste management, barnyard runoff control, mortality composting. Precision feed management for all animals. Same standards apply to AFOs not subject to CAFO permit except no feed management on dairies; designation as necessary.
- Additional **adjustments to agriculture nonpoint** sources as necessary to exactly meet nitrogen, phosphorus and sediment allocations.

Ches Bay TMDL Possible Impacts

- Bay TMDL *will cost* Hampton Roads citizens up to $1,400 per household each year using backstop requirements
- Implementing stormwater nutrient reductions is logistically challenging.
  - Only 15 years to plan, negotiate, finance, and construct $3-9B of stormwater treatment facilities.
- Reductions will be enforced with MS4 stormwater permits.
- If localities don't meet permit milestones:
  - Fines
  - Enforcement actions

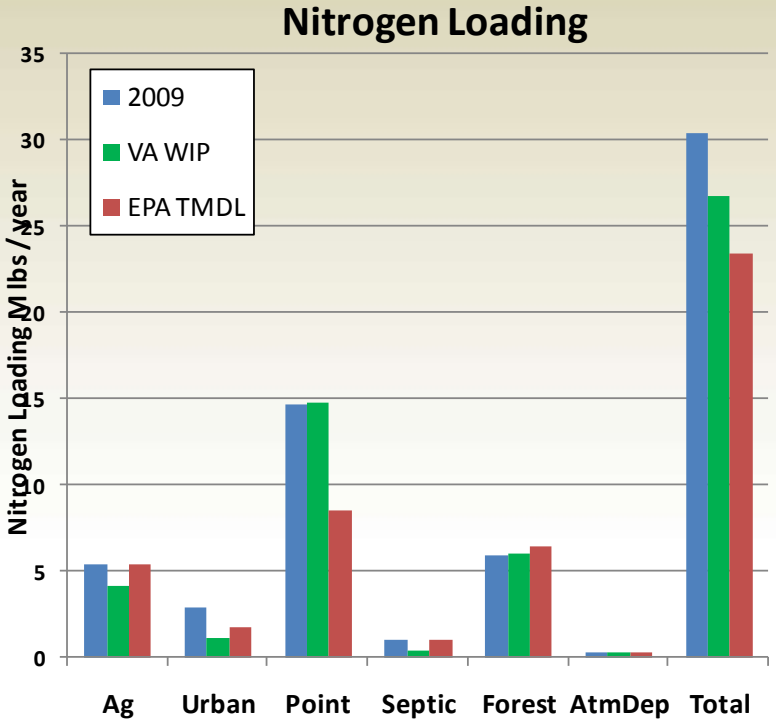
EPA and VA Gap

- 2009 nutrient loads in blue
- Virginia's proposed loads in green
- EPA's proposal in red.



Phosphorus
Total EPA cut = 0.35 Mlbs

Point source cut = 0.509 Mlbs
Urban increase = 0.156 Mlbs
Ag increase = 0.03 Mlbs



Nitrogen
Total EPA cut = 3.31 Mlbs

Point source cut = 6.24 Mlbs
Urban increase = 0.64 Mlbs
Ag increase = 1.2 Mlbs

Preliminary Estimated Capital Cost to comply with EPA TMDL Allocations for Urban Stormwater *

Community	Total cost			Annual Cost			
	BMP Costs (Millions)	Storage & Reuse Costs (Millions)	Total (Millions)	BMP Costs (Millions)	BMP Costs per capita	Total (Millions)	Total per capita
Chesapeake	$210	$1,157	$1,367	$15	$67	$98	$437
Hampton	$148	$905	$1,053	$11	$71	$75	$509
Newport News	$172	$994	$1,166	$12	$68	$83	$461
Norfolk	$208	$1,176	$1,384	$15	$63	$99	$419
Portsmouth	$100	$566	$666	$7	$71	$48	$472
Virginia Beach	$264	$1,474	$1,737	$19	$43	$124	$284
Isle Of Wight	$35	$196	$231	$3	$70	$17	$460
James City	$75	$427	$501	$5	$81	$36	$546
Poquoson	$12	$77	$90	$1	$72	$6	$526
Suffolk	$95	$533	$628	$7	$80	$45	$528
Williamsburg	$14	$80	$94	$1	$74	$7	$510
York	$82	$512	$594	$6	$91	$42	$658
TOTAL	$1,414	$8,096	$9,510	$101		$679	

*Based on retrofitting 19% of land with BMPs and remaining reductions achieved with storage and reuse.

Example Impacts

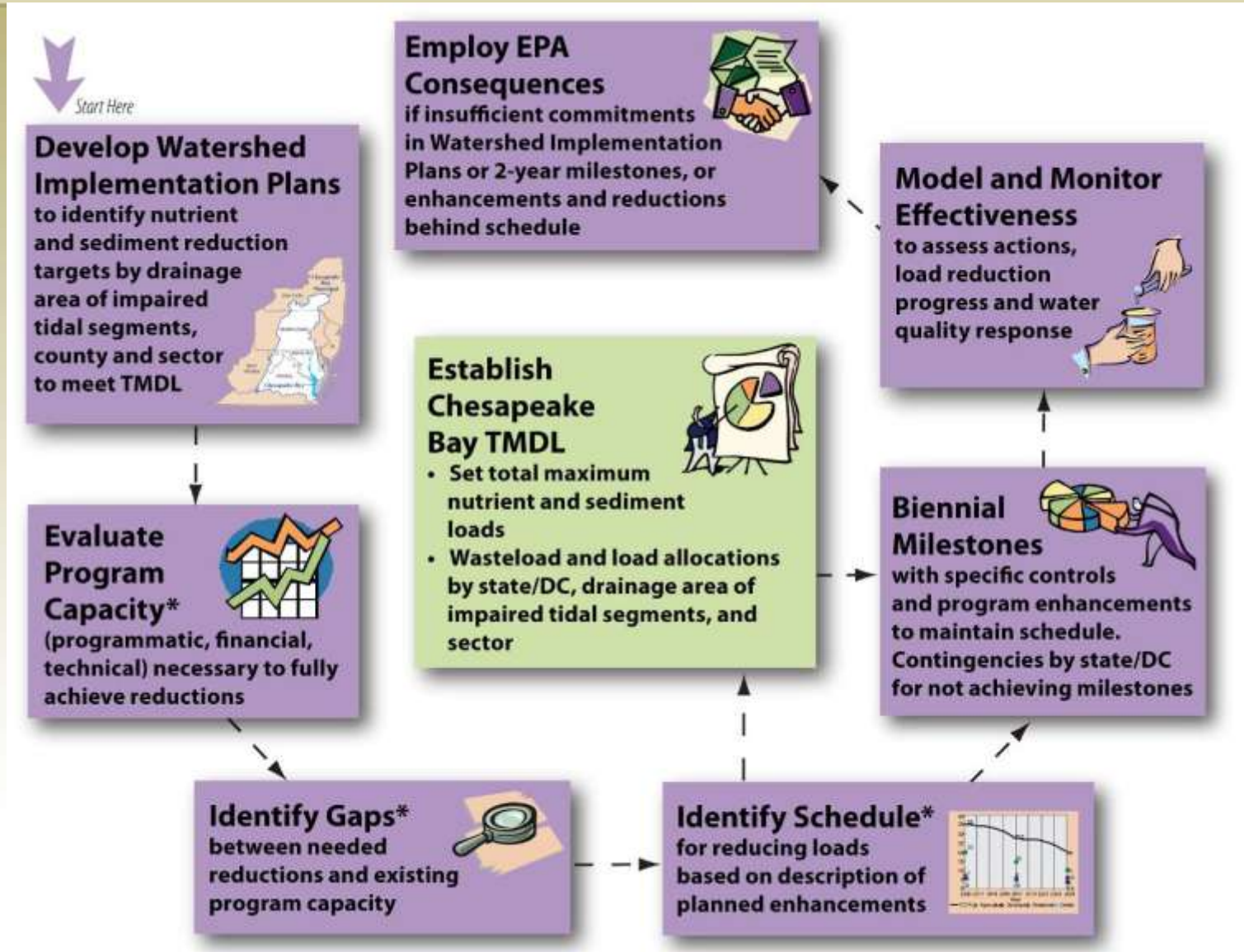
- HRSD Treatment Plants
  - If VA WIP is not “strengthened”
  - Significant wastewater plants go to 4 mg/l TN and 0.3 mg/l TP
  - Will require millions of dollars of plan improvement

	James River Watershed		York River Watershed	
	Current	Possible	Current	Possible
WLA TN (lbs/yr)	6,000,000	2,187,000	288,315	191,650
TN conc. (mg/l)	11.0	4.0	6.0	4.0
WLA TP (lbs/yr)	582,258	164,023	33,660	14,370
TP conc. (mg/l)	1.1	0.3	0.7	0.3

Some Virginia Comments on TMDL

- VA Secretary of Natural Resources & WIP:
  - *The Bay model "continues to experience fundamental flaws"*
  - *EPA's use of the model "assumes a level of precision far beyond what the model is capable of"*
  - *Model has flaws and limitations which make it a "rough approximation" of changes needed in Virginia*
  - *"specific and defensible criteria levels" for chlorophyll are not currently clearly supported*
  - *The resulting allocation for the James River due to the chlorophyll criteria "has not been adequately justified"*

The TMDL Process…



Summary

- The story is still being written…
  - EPA needs to respond to public comments
  - VA needs to modify its WIP
  - Lawsuits will probably be filed…

Sources

- Hampton Roads Planning District Commission
  - http://www.hrpdc.org/
- Hampton Roads Sanitation District
  - Commission Meeting Presentation
  - http://www.hrsd.com/commission.htm
- EPA
  - http:// www.epa.gov/chesapeakebaytmdl
- DEQ
  - http:// ww.deq.virginia.gov/tmdl/chesapeakebay.html VA
- DCR
  - http:// www.dcr.virginia.gov/soil_and_water/baytmdl.shtm