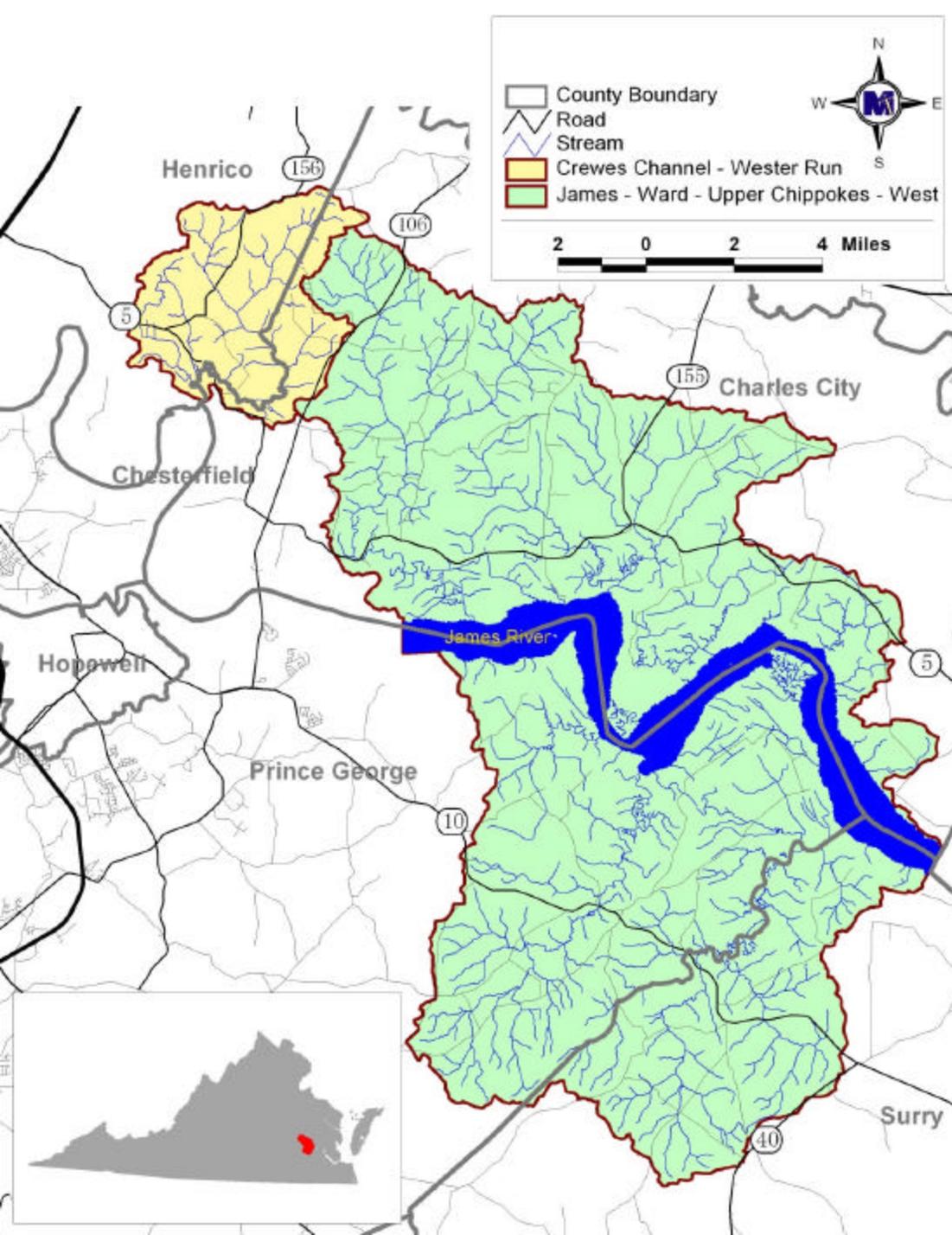




James River and Tributaries TMDL First Public Meeting

August 2, 2011



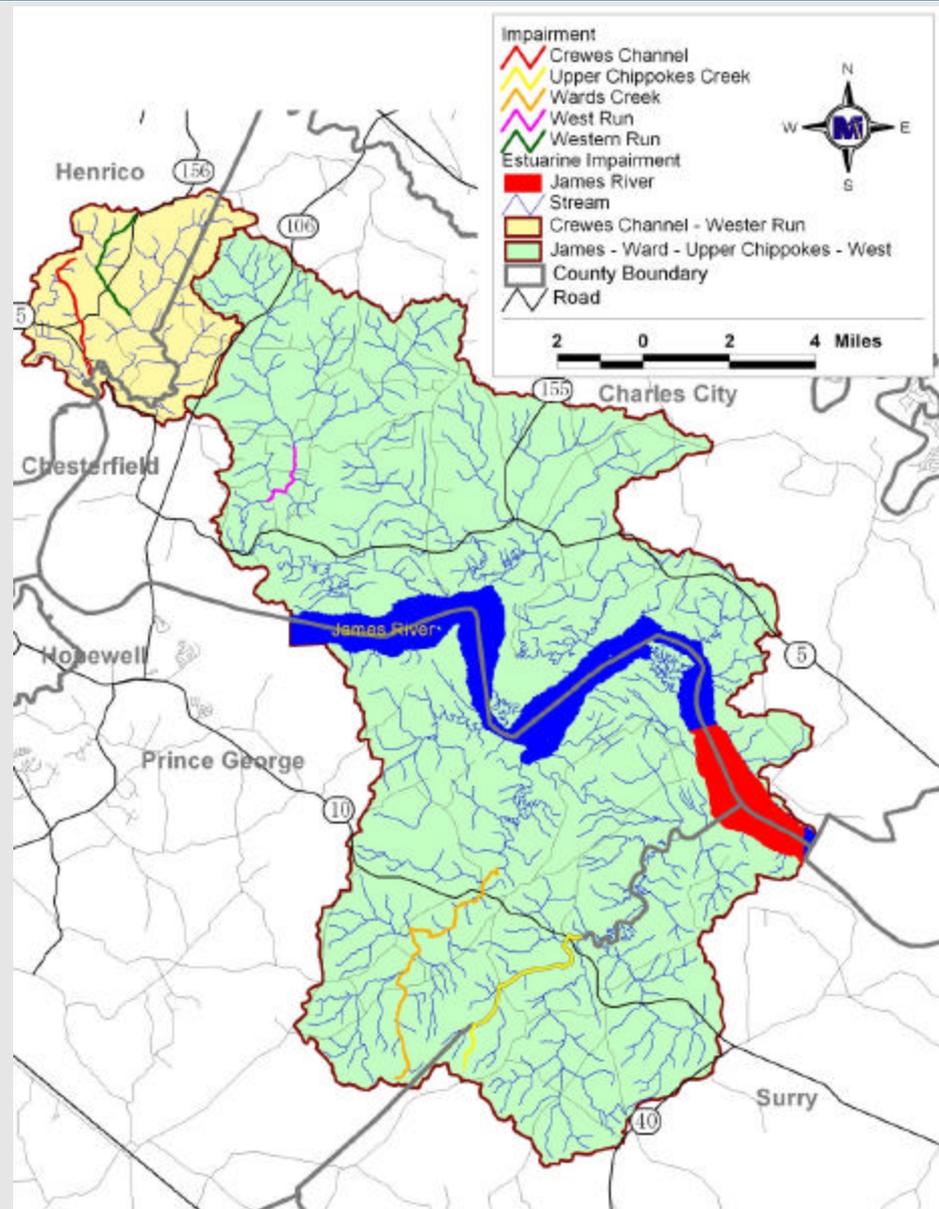
Location of Study Area

E.coli Impairments

Stream Name Impairment ID	Initial Listing Year	2010 Size of Impairment	EC 2010 Listing Violation %	Impairment Location Description
James River VAP-G04E_JMS03A04	2010	3.76 sq. mile	20	From Brandon Point downstream to the transition boundary (~river mile 52.08).
Crewes Channel VAP-G02R_CCH01A00	2008	3.19 mile	12.5	From its headwaters downstream to the tidal limit.
Wards Creek VAP-G04R_WRD01A00	2006	8.46 mile	18	From its headwaters to the tidal limit.
Upper Chippokes Creek VAP-G04R_UCK01A08	2008	5.61 mile	20	From its headwaters downstream its tidal limit.
West Run VAP-G03R_WER03A00	2010	1.86 mile	16.7	From its confluence with East Run downstream to backwaters of Harrison Lake.
Western Run VAP-G02R_WSN01A00	2006	1.84 mile	37.5	From its headwaters downstream to confluence with Turkey Island Creek.

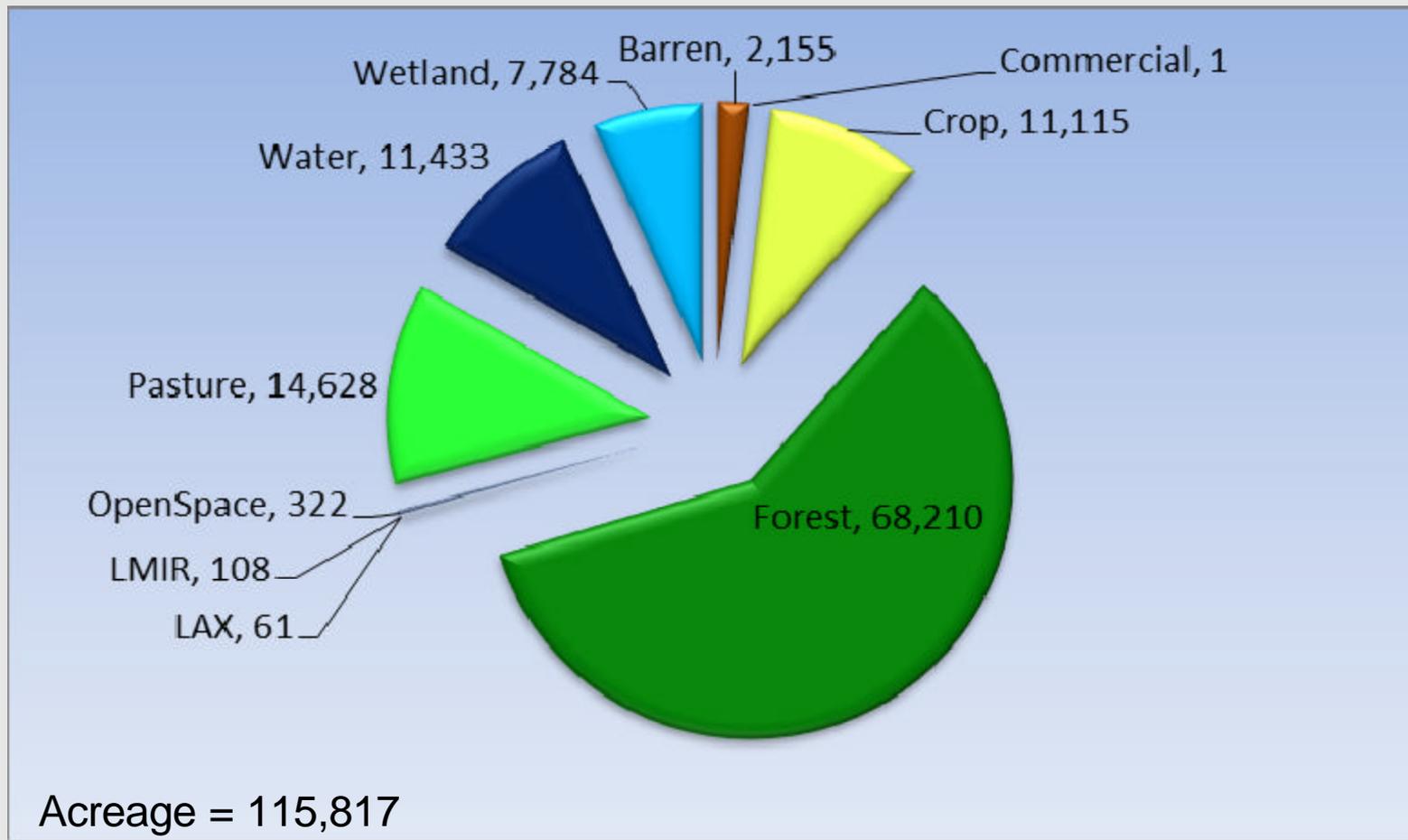
E. coli Impairments

- **Crewes Channel and Western Run**
 - Are tribs to the recently completed TMDL for the James River (City of Richmond in 2010)
 - Watershed data for the two streams is utilized from the completed TMDL
 - impairments were grouped together.
 - Analysis was extended downstream to cover the entire Turkey Island Creek watershed to the confluence with the James River.
- **The remaining four impairments were grouped together as James and tributaries**
 - The downstream end of the area of interest for these impairments is the James Estuarine impairment
 - The upstream end of the area of interest is the same as the downstream end of another recently developed EC TMDL (Hopewell to Westover EC TMDL in 2008)
 - All source assessment data shown in this presentation represents this portion of the area of interest.



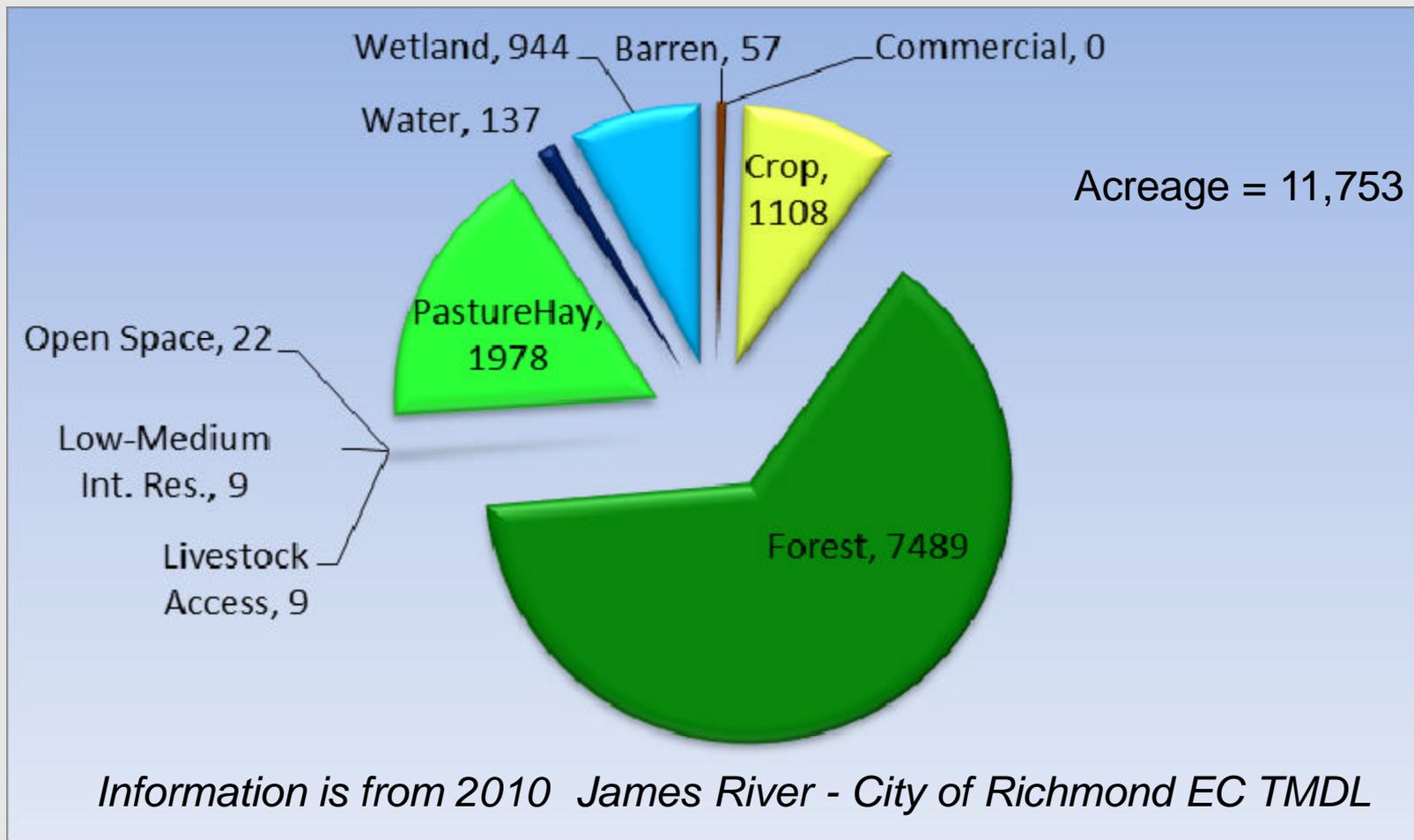
Land Use-

James R., Upper Chippokes Creek, West Run, Wards Creek



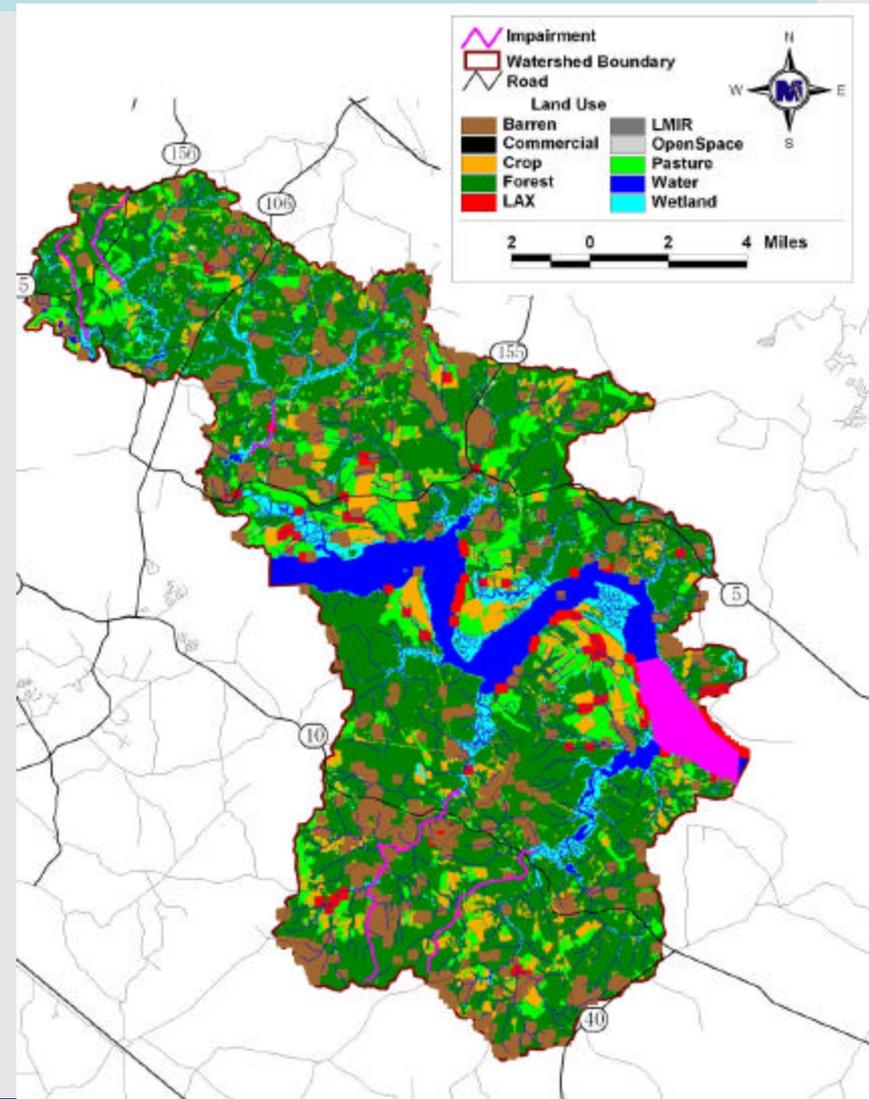
Land Use-

Turkey Island Creek watershed (Crewes Channel and Western Run)

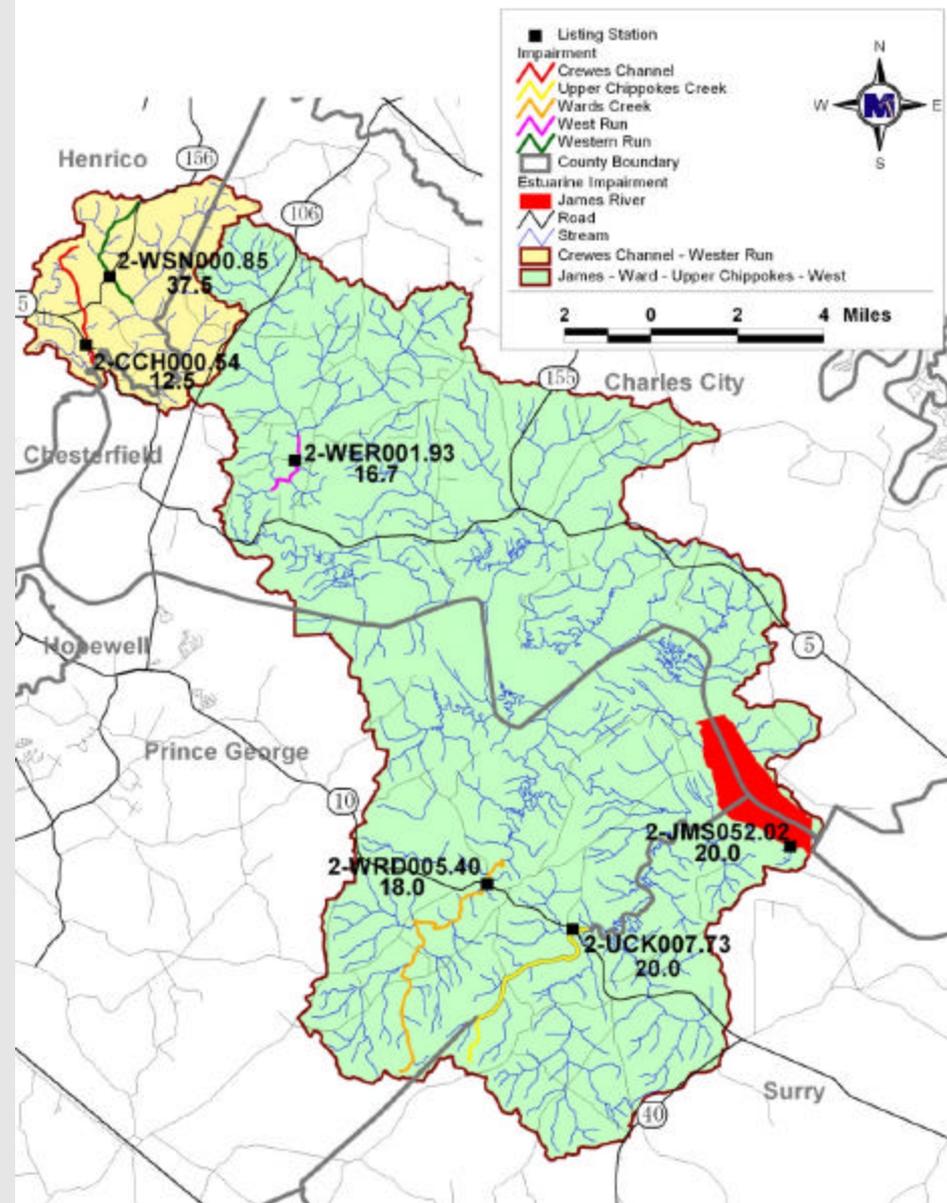


Land Use

- Sources of data is the 2001 Multi-Resolution Land Cover (MRLC) Data



Bacteria Data DEQ Monitoring Station Locations



Water Quality Data Analysis

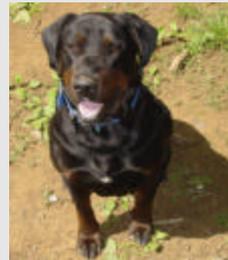
- *E.coli* -

Stream	Station	Date	Count	Minimum	Maximum	Mean	Median	Standard Deviation	Violation ¹ %
Crewes Channel	2-CCH000.54	5/2004 - 11/2006	16	25	500	136	88	152	12.50
James River	2-JMS052.02	6/2007 -12/2010	22	25	300	105	100	80	9.1
Upper Chippokes Creek	2-UCK007.73	5/2005-11/2006							
Wards Creek	2-WRD005.40	8/2003-							
West Run	2-WER001.93	1/2007-11/2008							
Western Run	2-WSN000.85	5/2004-11/2006							

Bacteria Source Assessment

Source Assessment

- Permitted discharges
 - Wastewater treatment facilities
 - Other Permitted Discharges
- Human
 - Biosolids
 - Failed Septic Systems
 - Straight Pipes
 - Overflows
- Pets
- Livestock
- Wildlife



Permitted Discharges

Permit Number	Facility Name	Type	Permitted for EC	Design Flow (MGD)	Receiving Waterbody
VA0021261	Ruthville Community Center WWTP	Municipal	Yes	0.01	U.T. to Glebe Creek
VA0060585	Charles City Administration Building	Municipal	Yes	0.0045	Courthouse Creek
VA0086673	Charles City County Schools WWTF	Municipal	Yes	0.025	Courthouse Creek
VA0079057	Sign Post Estates WWTP	Municipal	Yes	0.0072	East Run
VAG404206	Residence	General	Yes	0.001	UT Turkey Island Creek
VAG404253	Farm	General	Yes	0.001	UT Wards Creek

Human Source

Population, housing units, and onsite treatment system based on U.S. Census

- **Septic Systems**
 - Failure to soil surface throughout year or during wet season only
 - Lateral movement continuously to stream
- **Straight Pipes**
 - Direct continuous input into stream
- **Biosolids (DEQ Permitting Database)**
 - Land-applied

Human Source (2011)

Local health departments assisted in validating the initial estimates

Human Population	Housing Units (HU)	HU on Sewer	HU on Septic	Straight Pipes	Failing Septic Systems
5,910	2,664	92	2,554	18	84

Pet Sources

- Population/household based on literature values, veterinarians, and animal control
- Translated to housing units based on U.S. Census
 - 0.53 dog per housing unit
 - 0.6 cat per housing unit
- Land-applied

Pet Source (2011)

Dog Population	Cat Population
1,423	1,593

Livestock Sources

- Population
 - Virginia Agricultural Statistics
 - Consultation with SWCD, NRCS, VADCR, and VCE
 - Watershed surveys
- Distribution of waste
 - Pastured
 - Confined, waste collected, spread
 - Direct deposition to the stream
- Seasonal varying applications

Livestock Population (2011)

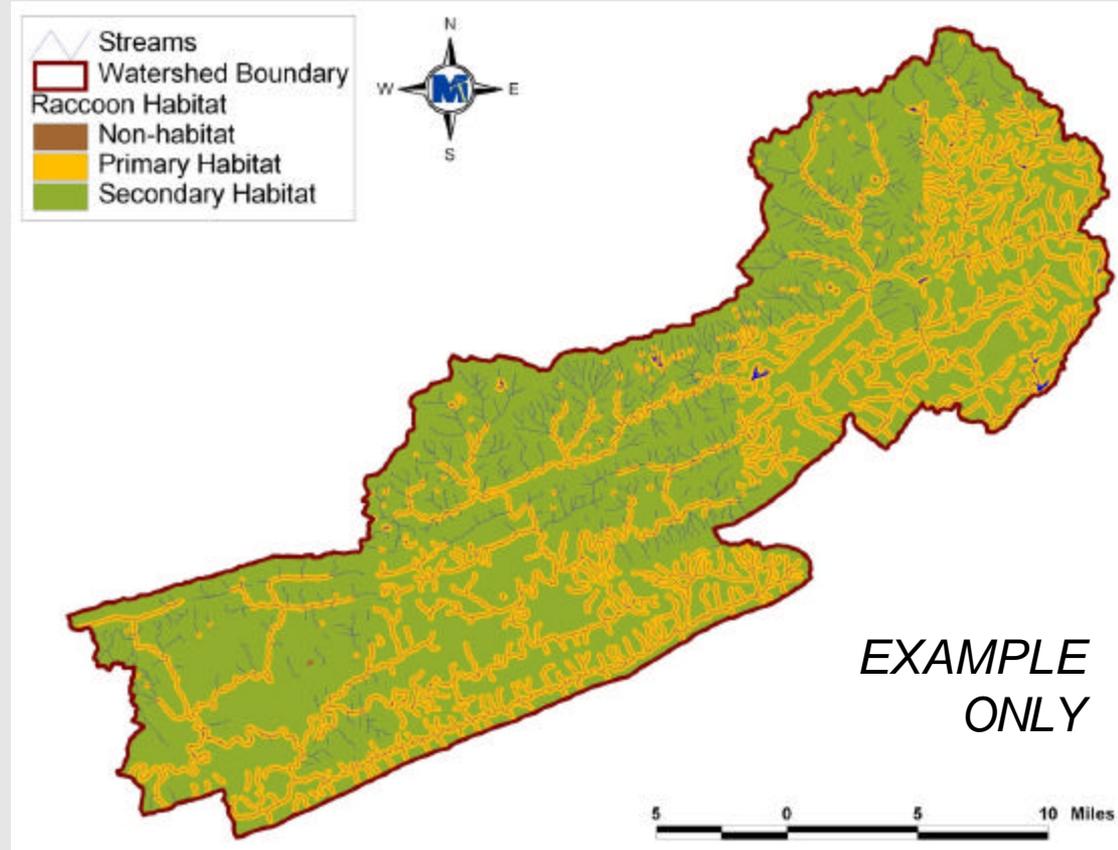
Beef	Beef Calves	Horse	Sheep	Hog
184	563	311	18	3,500*

*USDA Census/VA DCR AFO Database indicated one farm in Courthouse Creek with 3500 Hogs

Wildlife Source

- Population
 - Animal densities from VDGIF biologists
 - Habitat from literature values and GIS
- Distribution of waste based on habitat
 - Land-applied
 - Direct deposition to the stream
- Seasonal variations based on migration patterns and food sources

*Example: If raccoon density were 0.0343 animal per acre of habitat, and there were 103,032 acres of raccoon habitat, then raccoon population would be $0.0343 * 103,032 = 3,534$ raccoon.*



Wildlife Population (2011)

Deer	Turkey	Beaver	Raccoon	Muskrat	Duck	Goose

How do we Determine the TMDLs?



+

Watershed data

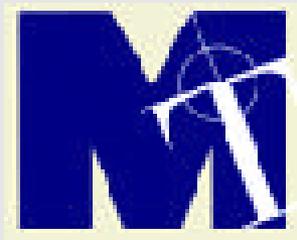


TMDL



- Conduct the Analyses
- Public Meeting 2 (late Fall)
- Public Review
- Submit to EPA
- State Approval
- Implementation Plan Development (early Spring)
- Implementation





We appreciate that you're taking the time to come to the meeting!

We 'd also appreciate your feedback!

Public comment period begins August 3rd, 2011 and ends September 1st, 2011

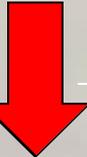
Comments may be mailed, faxed, emailed (contact info on next page).

Presentation will be available at the DEQ web site at

<http://www.deq.virginia.gov/tmdl/mtgppt.html>

Contact Information

Send Comments to



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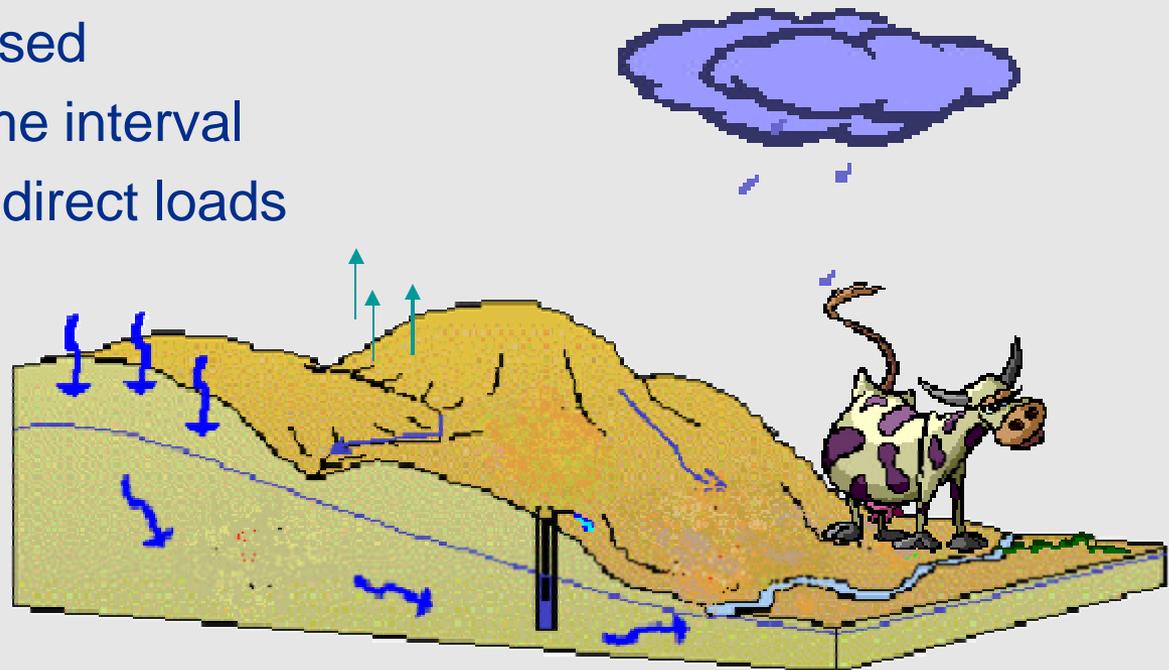
Web: www.maptech-inc.com

Appendix B

Modeling

Modeling - Bacteria

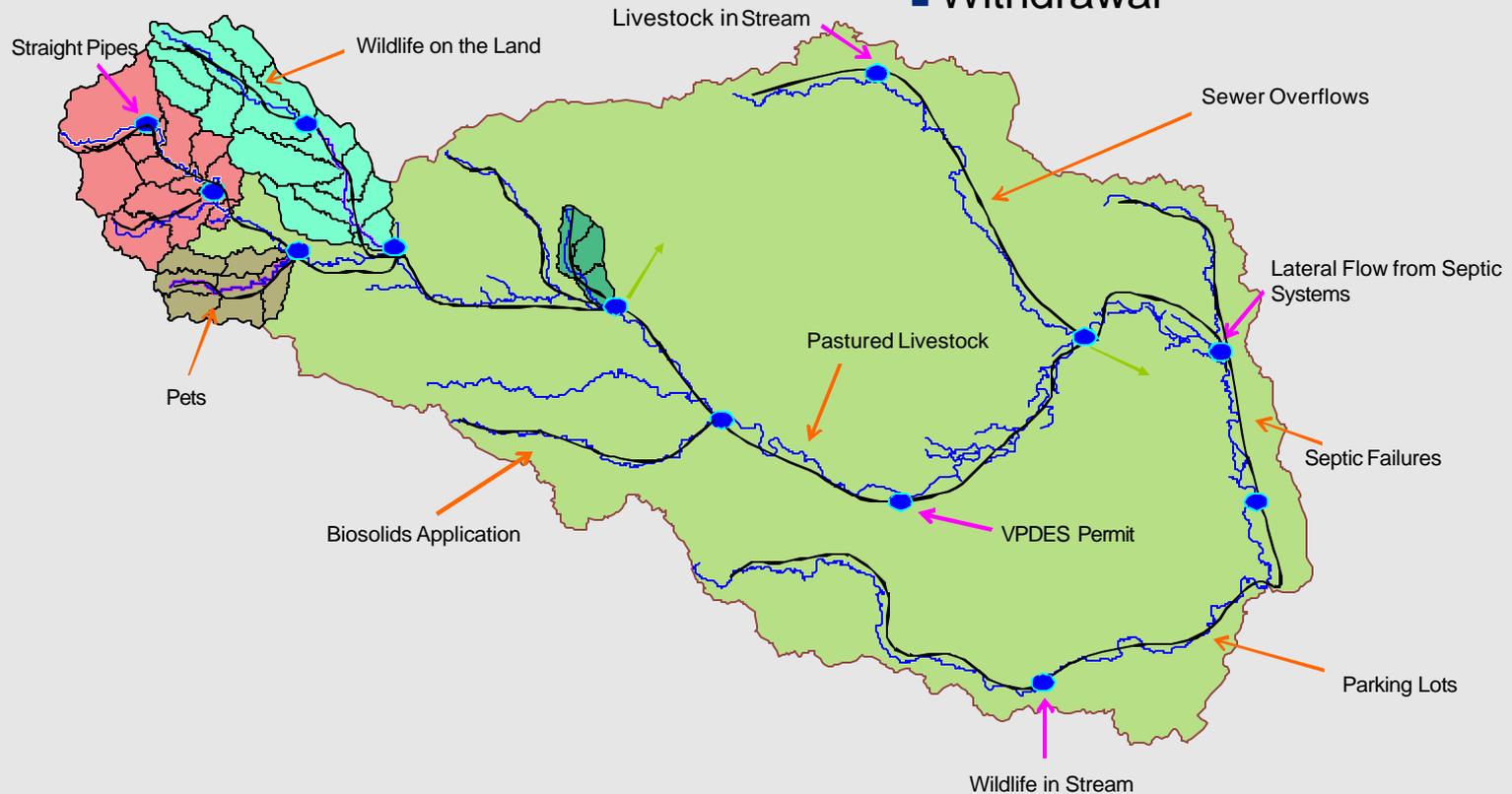
- Rainfall-Runoff-Water Quality
 - Hydrologic Simulation Program – Fortran (HSPF)
 - ◆ Watershed-based
 - ◆ Continuous time interval
 - ◆ Land-applied, direct loads



Conceptual Model

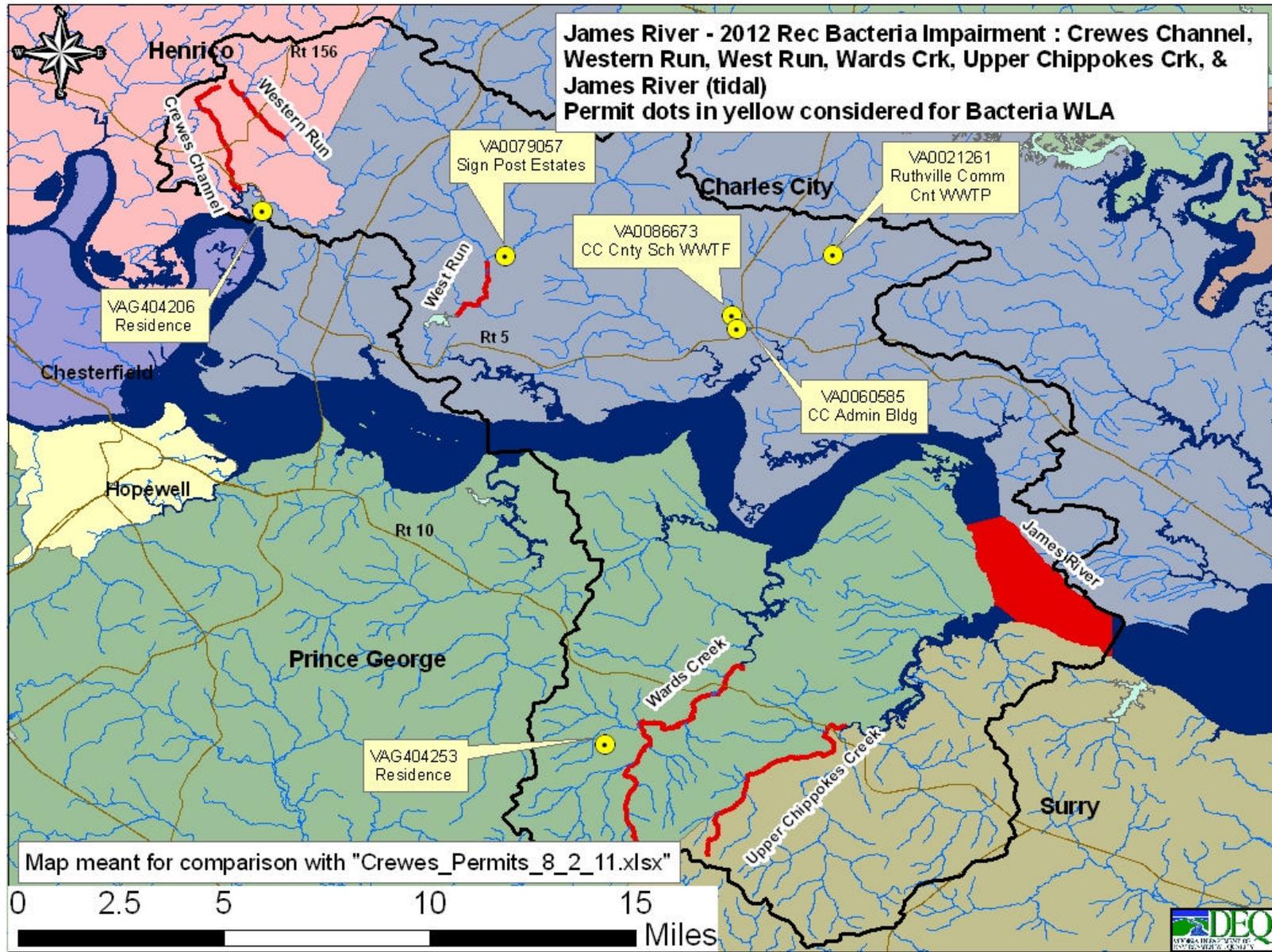


- Mathematical Representation
- Overland
- Direct discharges
- Withdrawal



Appendix C

Permit Map



Appendix C

Livestock – Farm in Courthouse Creek watershed

