



# **Virginia Department of Environmental Quality**

## **Overview of TMDL Program and TMDL Implementation Progress Report**

**(As Compiled February 23, 2005)**

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**Virginia Department of Environmental Quality**



*March 10, 2006*

# Total Maximum Daily Loads are Mandated

- **Federal 1972 Clean Water Act requires**
  - **Water Quality Monitoring**
  - **Periodic Assessment and Impaired Waters Listing**
  - **Develop TMDLs for Impaired Waters**
- **Virginia's 1997 Water Quality Monitoring Information and Restoration Act (WQMIRA) requires**
  - **TMDLs for Impaired Waters**
  - **An Implementation Plan**
- **1999 Consent Decree with EPA to develop TMDL Reports for all 1998 listed streams by 2010**

# Components of a TMDL Report and a TMDL Implementation Plan

## **Components of a TMDL Report:**

1. Executive Summary
2. Background description for listing segment
3. TMDL Target/Water Quality Standard
4. Watershed Characterization
5. Source Assessment
6. Model Calibration
7. Allocation Scenarios/TMDL
8. Reasonable Assurance /Implementation
9. Public Participation

## **Components of a TMDL Implementation Plan:**

1. Executive Summary
2. Introduction
3. State and Federal Requirements for Implementation Plans
4. Review of TMDL Development
5. Public Participation
6. Implementation Actions
7. Measurable Goals and Milestones
8. Stakeholders' Roles and Responsibilities
9. Integration with Other Watershed Plans
10. Potential Funding Sources

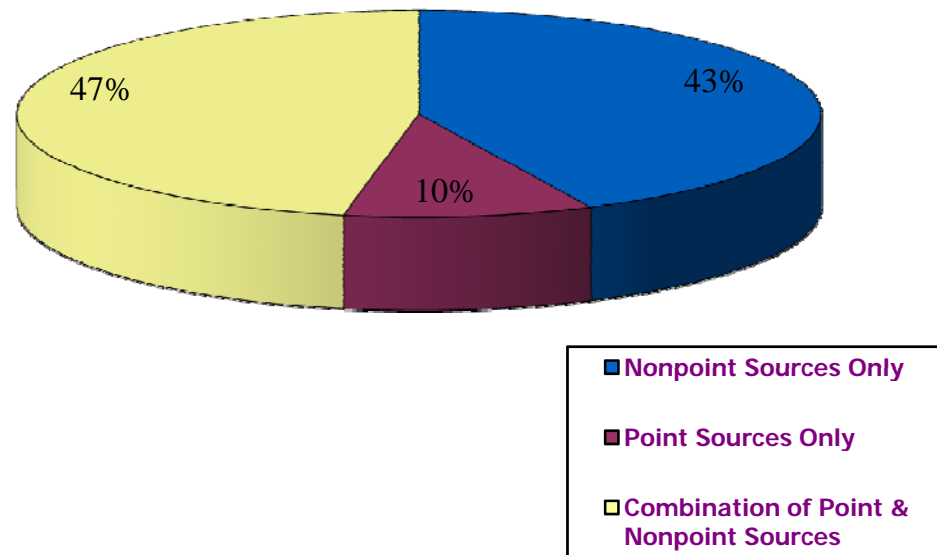


# Number of TMDL Segments on Virginia's 1998 TMDL List

	Number of Impaired Segments	Number of Segments for TMDL Action	Estimated Number of TMDLs
DEQ Waters	247	247	295
DEQ Shellfish Waters	285	260	260
EPA Additions	71	18	18
Consent Decree Additions	200	75	75
Totals	803	600	648

# Total Maximum Daily Loads

- Critical program for achieving healthy watersheds and clean water nationwide
  - States report over 40 percent of assessed waters are still too polluted for fishing or swimming even after 28 years of water pollution control efforts



# Status of TMDL Development

Total Waters under Consent Decree (CD)	672
Freshwater CD Waters Completed or Delisted in 1999 - 2004	141
Freshwater CD Waters Completed/Contracted for 2006	107
Shellfish CD Waters Completed or Delisted in 2004	61
Shellfish CD Waters Completed/Contracted for 2006	55
<b>Remaining CD Waters to be completed in 2008 and 2010</b>	<b>308</b>

Basin	Total CD Segments		CD Segments with completed TMDLs		Delisted and Closed CD Segments		CD segments scheduled for 2006	
	Fresh	Shellfish	Fresh	Shellfish	Fresh	Shellfish	Fresh	Shellfish
Bay/Coastal	25	127	0	4	0	30	1	43
Chowan	45	0	3	0	3	0	29	0
James	93	17	19	0	8	2	8	4
New	14	0	7	0	0	0	3	0
Potomac, Shenandoah	101	48	55	9	3	7	18	0
Rappahannock	30	37	4	0	2	3	11	8
Roanoke	53	0	21	0	4	0	14	0
Tennessee, Big Sandy	40	0	12	0	3	0	11	0
York	24	18	0	0	0	6	12	0
<b>Total</b>	<b>425</b>	<b>247</b>	<b>121</b>	<b>13</b>	<b>23</b>	<b>48</b>	<b>107</b>	<b>55</b>

# Status of Implementation Plan Development

Basin	IPs Completed	Number of segments in completed IPs	Number of different impairments in completed IPs	IPs proposed for completion 1	Number of segments in proposed IPs	Number of different impairments in contracted IPs
Bay/Coastal	0	0	0	0	0	0
Chowan	0	0	0	2	9	1
James	0	0	0	2	2	1
New	0	0	0	2	3	1
Potomac/Shenandoah	4	10	2	4	9	3
Rappahannock	0	0	0	2	7	1
Roanoke	1	4	1	2	8	1
Tennessee/Big Sandy	1	4	1	2	3	2
York	0	0	0	0	0	0
Shellfish	0	0	0	1	2	1
Total	6	18	n/a	16	42	n/a

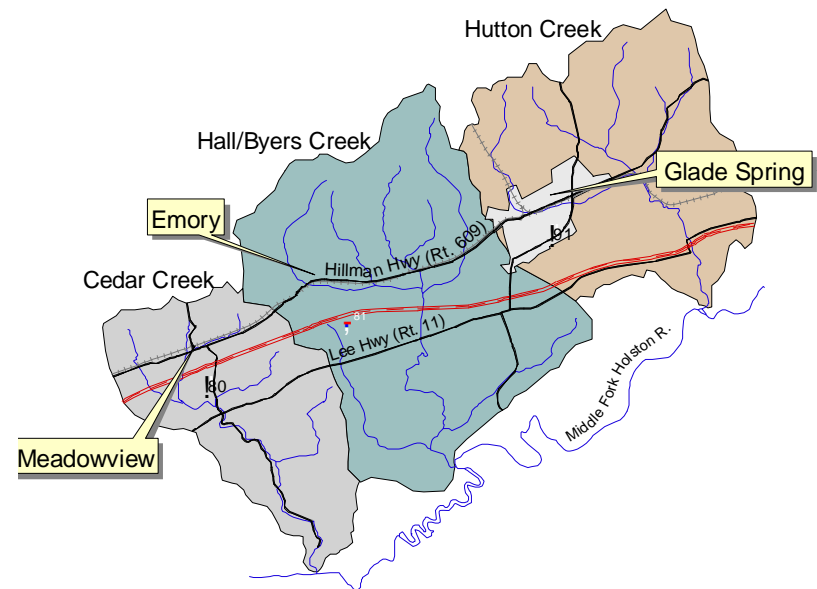
# Implementation Plan Case Studies

## Measuring Success

- M.Fk. Holston River - Wash. Co.-Ag.NPS
- Middle Ck. - Tazewell Co.-Coal Mining
- North River - Rockingham Co.-Ag.NPS
- Blackwater River - Franklin Co.-Ag.NPS
- Four Mile Run - Arlington, Fairfax Cos.-  
Urban NPS
- Quail Run - Rockingham Co. - Point  
Source

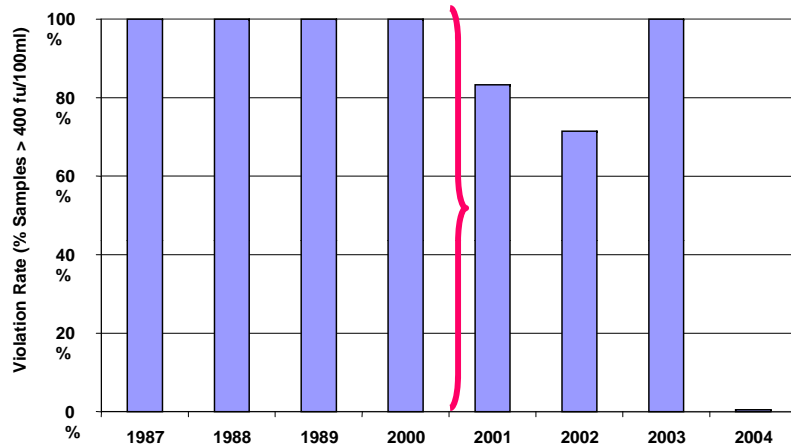
# Middle Fork Holston River TMDL

- Bacteria TMDL completed
  - Cedar Creek - 2000
  - Hall/Byers Creek - 2000
  - Hutton Creek - 2000
- Benthic TMDLs completed
  - Cedar Creek - 2003
  - Hall/Byers Creek - 2003
  - Hutton Creek - 2003

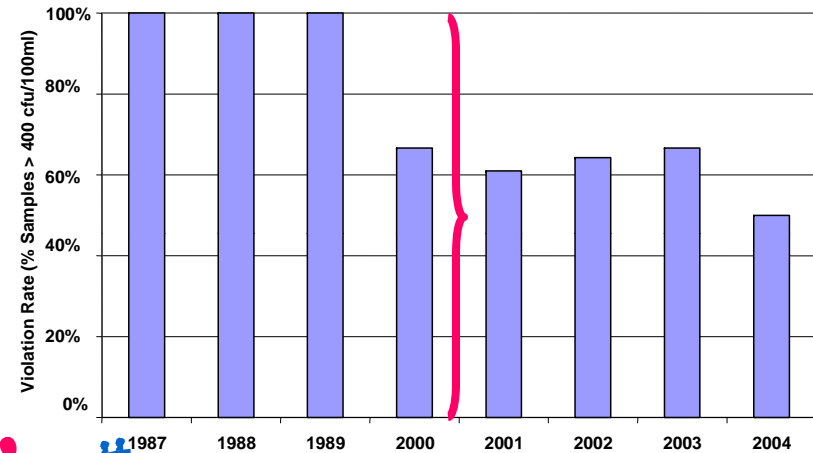


# Middle Fork Holston River Water Quality

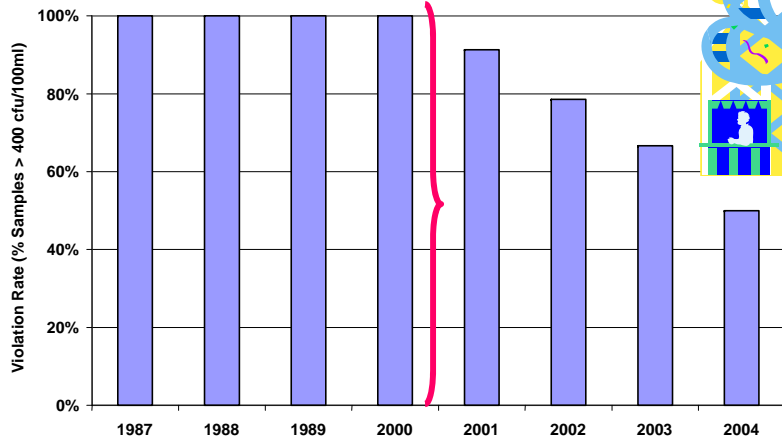
## Cedar Creek



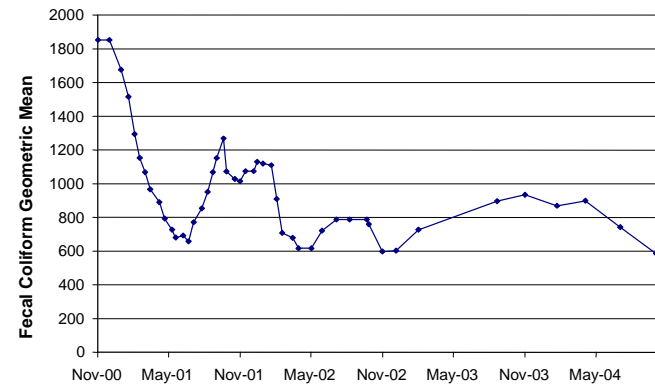
## Hall/Byers Creek



## Hutton Creek



## Cedar Ck Running Geometric Mean



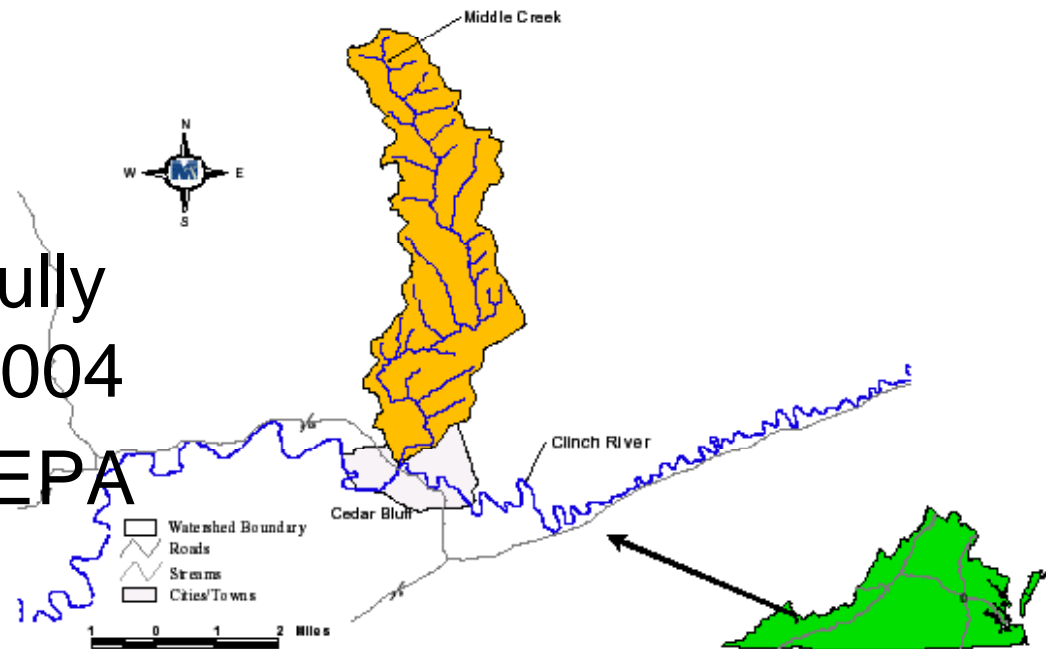
# Middle Fork Holston River (3 Creeks) IP

- Completed in 2001 for Bacteria, amended in 2003 to include BMPs for Sediment reduction

Control Measure	Units	Estimated Units Needed 1	Units Completed	Percent Completed
<i>Agriculture Program</i>				
Stream Exclusion Fencing	feet	205,920	74,791	<b>36%</b>
Vegetative Cover on Critical Areas	acres	0.5	0	
Forested Riparian Buffer	acres	0	n/a	
<i>Residential Program</i>				
Septic System Pump Out	system	0	120	
Septic System Repair	system	67	9	
Sewer Connections	system	8	2	
Septic System Installation	system	67	4	
Alternative Waste Treatment System	system	67	1	
<i>Total On-Site System Installation &amp; Repairs</i>	system	209	16	<b>8%</b>

# Middle Creek TMDL

- Implementation Efforts Begin 1999 (Close Mining Facilities)
- Benthic TMDL contracted 2003
- Aquatic Life Use Fully Supporting 2003-2004
- Delist Package to EPA January 2005



# North River TMDL Background

- Bacteria TMDL completed
  - Muddy Creek - 1999
  - Dry River - 2001
  - Mill Creek - 2001
  - Pleasant Run - 2001
- Benthic TMDLs completed
  - Mill Creek - 2002
  - Pleasant Run - 2002
  - Muddy Creek - 2003



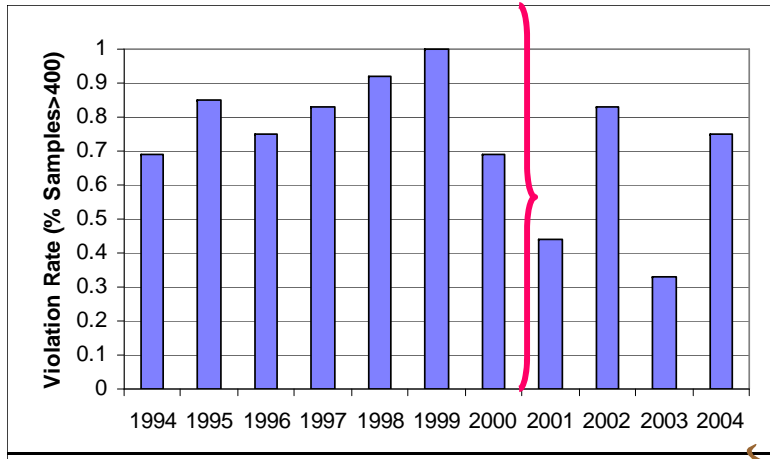
# North River Implementation Plan

- Completed in 2001 for Bacteria, amended in 2003 to include BMPs for Phosphorus and Sediment reduction

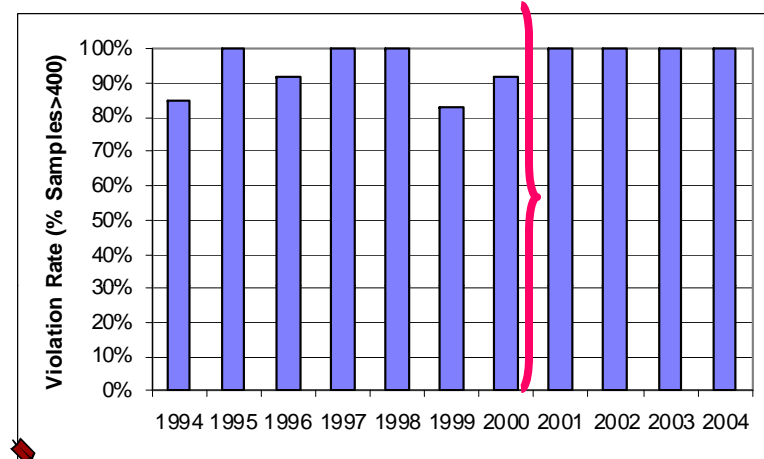
Control Measure	Units	Estimated Units Needed 1	Units Completed 2	Percent Completed
<i>Agriculture Program</i>				
Stream Exclusion Fencing	feet	612,480	30,093	5%
Vegetative Cover on Critical Areas	acres	5,154	876	17%
Forested Riparian Buffer	acres	0	10.3	
Nutrient Management Practices	acres	0	358	
Grassed Waterways	feet	0	4,785	
<i>Residential Program</i>				
Septic System Pump Out	system	0	7	
Septic System Repair	system	10	6	
Sewer Connections	system	0	0	
Septic System Installation	system	17	3	
Alternative Waste Treatment System	system	27	3	
<i>Total On-Site System Installation</i>	system	54	12	22%

# North River Water Quality

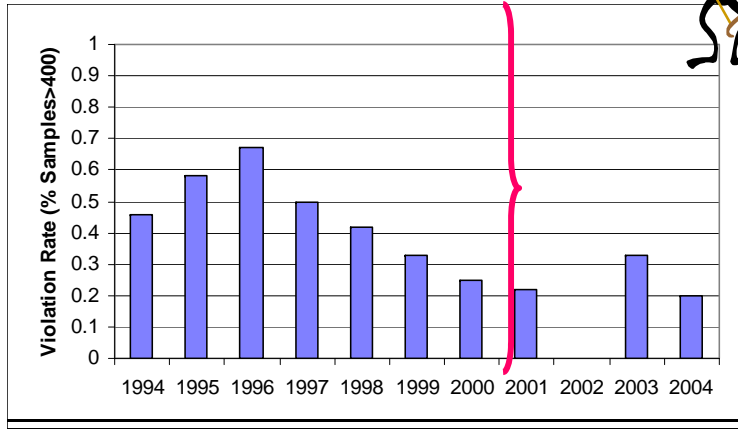
## Muddy Creek



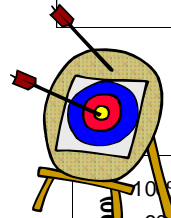
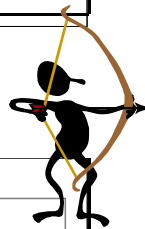
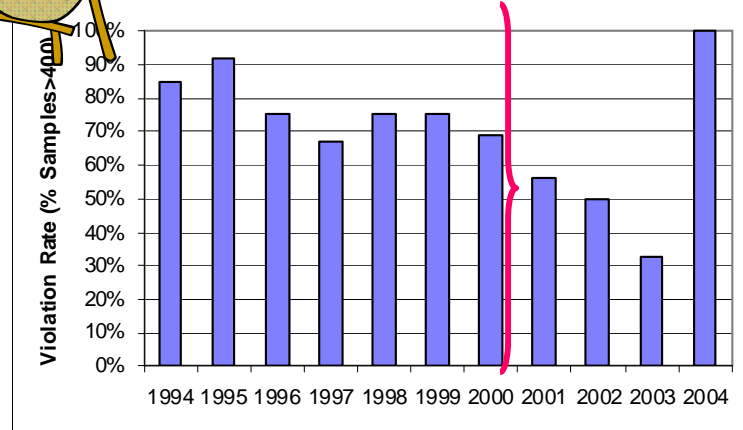
## Pleasant Run



## Lower Dry Run



## Mill Creek



# Blackwater River TMDL

- Bacteria TMDLs complete
  - North Fork - 2000
  - South Fork - 2000
  - Upper Blackwater - 2000
  - Middle Blackwater - 2000
- Benthic TMDLs complete
  - North Fork - 2004
  - Upper Blackwater - 2004



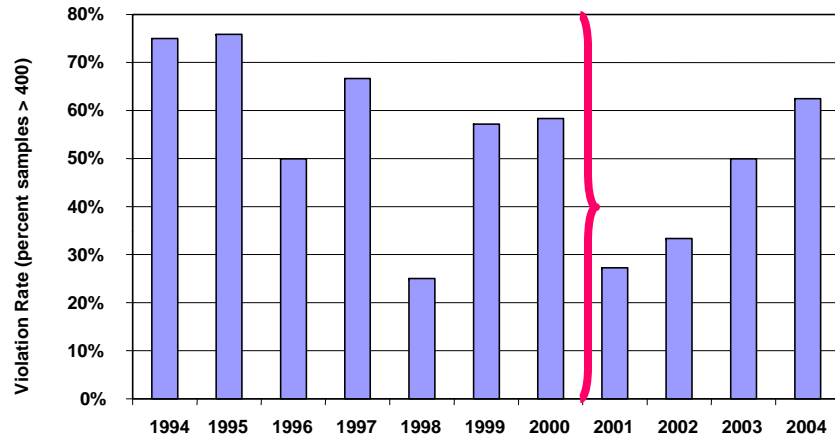
# Blackwater River IP

- Completed in 2001 for Bacteria, amended in 2003 for the Upper Blackwater and North Fork Blackwater River to include BMPs for Sediment reduction

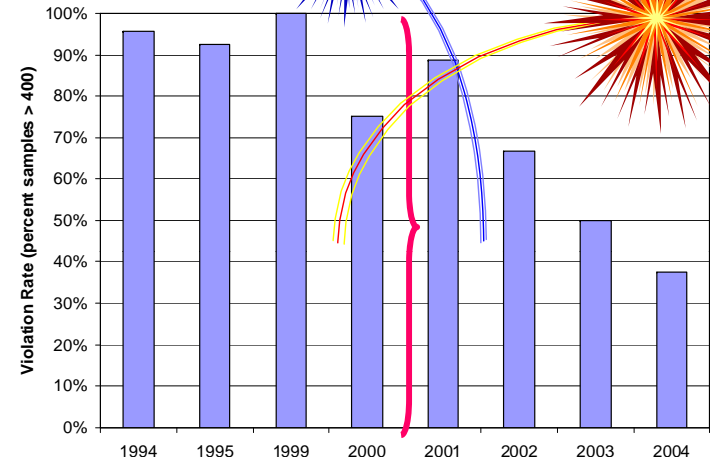
Control Measure	Units	Estimated Units Needed 1	Units Completed	Percent Completed	
<i>Agriculture Program</i>					
Stream Exclusion Fencing	feet	369,600	34,561	<b>9%</b>	
Vegetative Cover on Critical Areas	acres	0	4.7		
Forested Riparian Buffer	acres	0	5.2		
<i>Residential Program</i>					
Septic System Pump Out	system	0	0	<b>93%</b>	
Septic System Repair	system	0	3		
Sewer Connections	system	0	0		
Septic System Installation	system	7	14		
Alternative Waste Treatment System	system	8	0		
<i>Total On-Site System Installation</i>					
	system	15	14		

# Blackwater River Water Quality

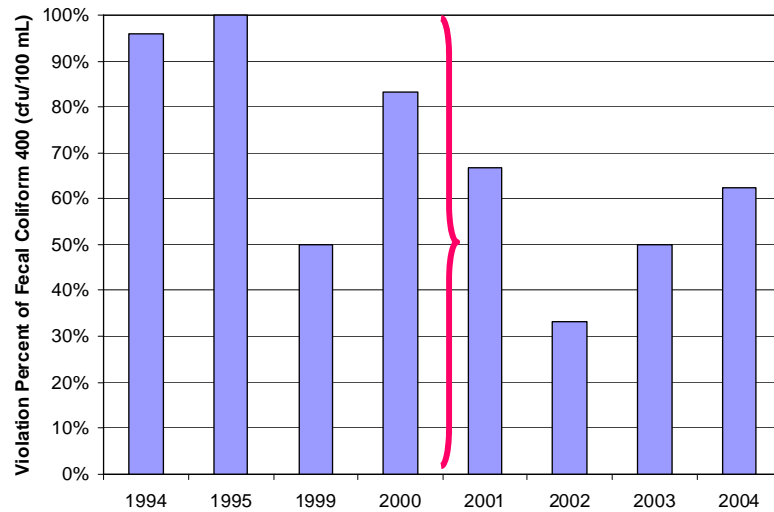
## Mainstem Blackwater



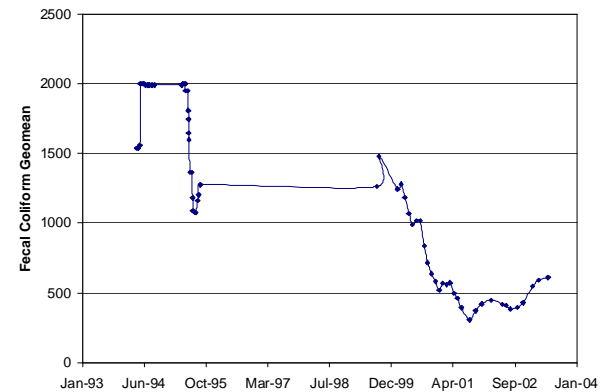
## Middle Blackwater (Teels Ck)



## Middle Blackwater (Little Creek)

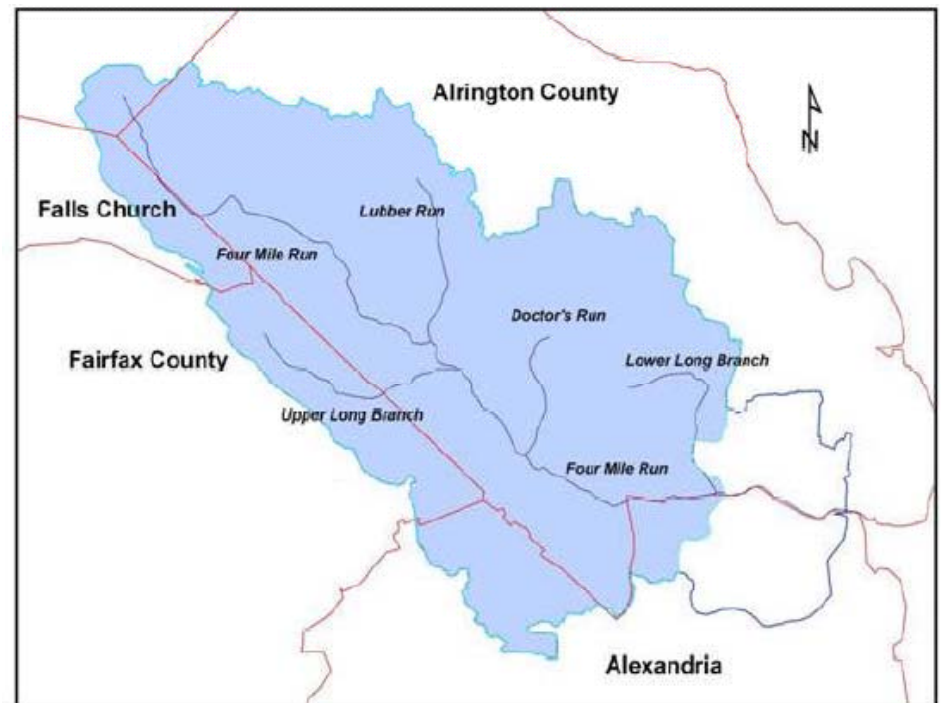


## Little Ck. Running Geometric Mean



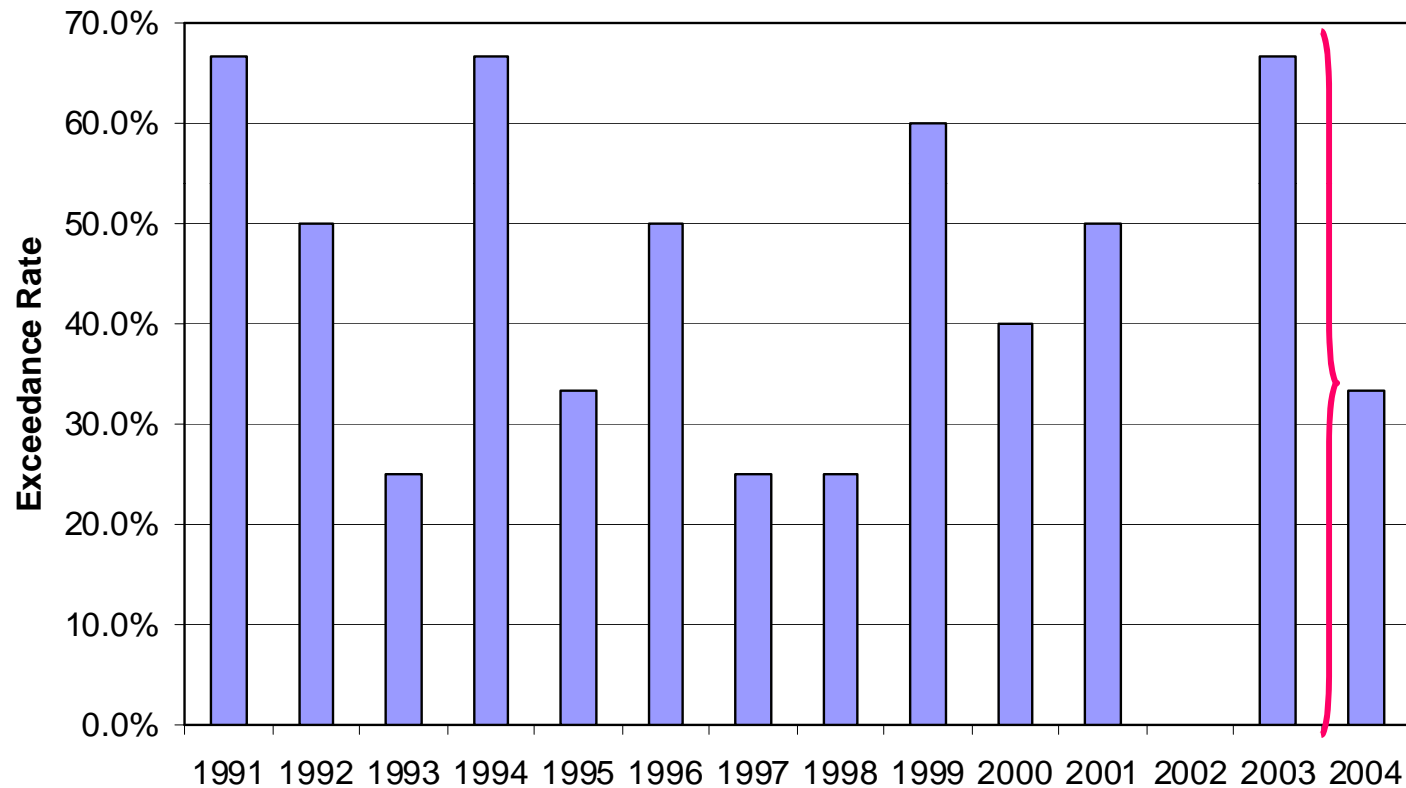
# Four Mile Run TMDL

- Bacteria TMDL complete 2002
- Implementation Plan complete 2004
  - Requires Urban BMPs



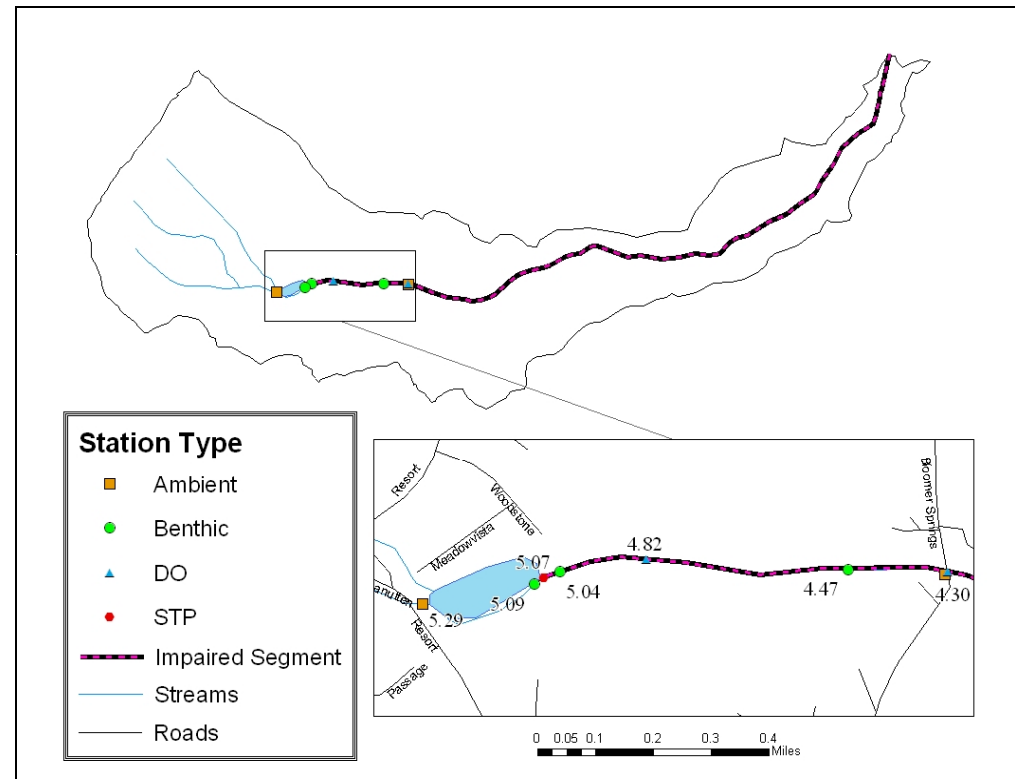
# Four Mile Run Water Quality

Four Mile Run 1AFOU001.92 and 1AFOU004.22



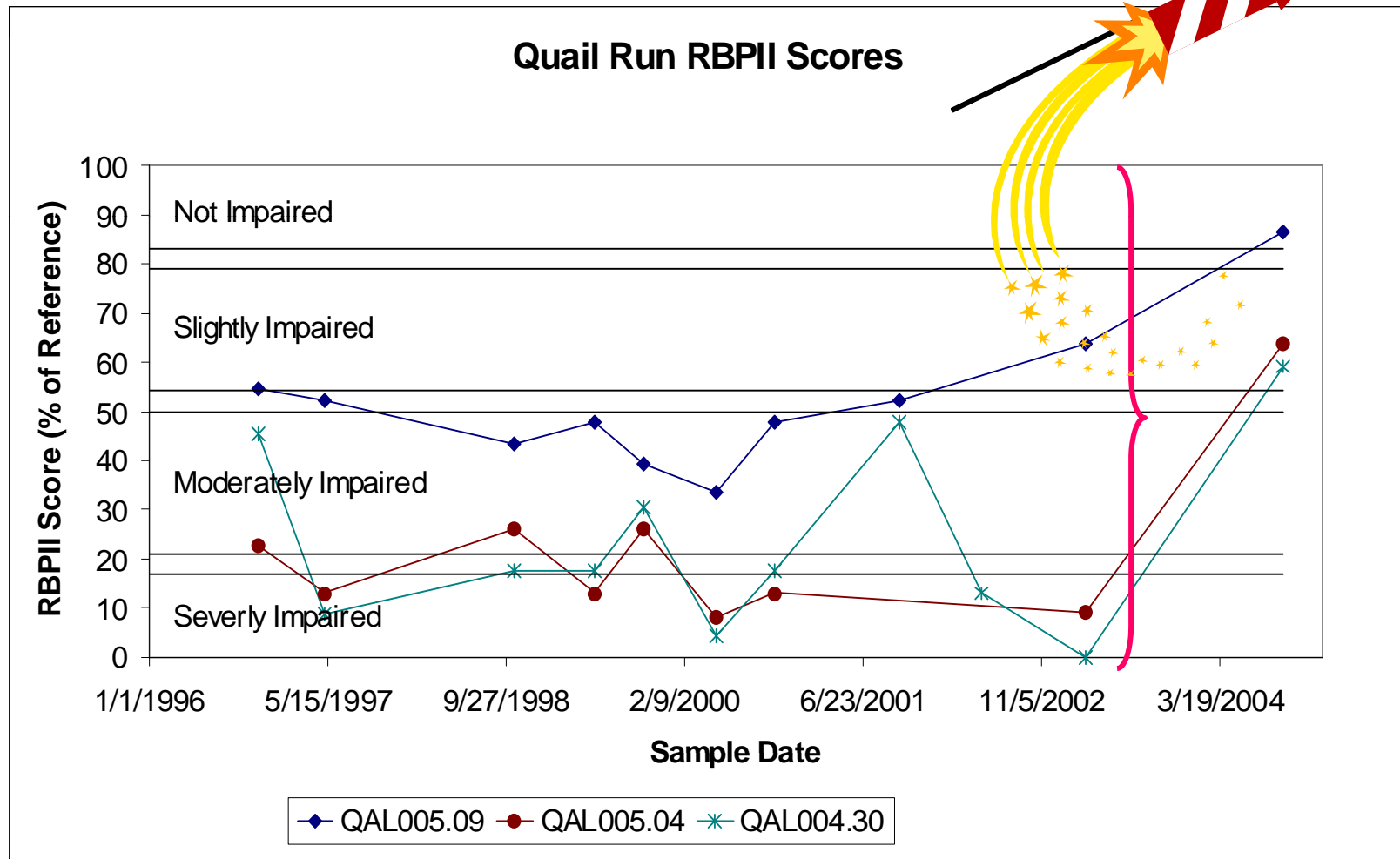
# Quail Run TMDL

- Benthic Stressor TMDL: Ammonia, Residual chlorine and chlorine byproducts complete 2003
- Implementation Plan- Massanutten STP treatment system upgrade first phase began operation 2003



# Quail Run Water Quality

- Biological Monitoring



# Implementation Plan Case Studies

## Measuring Success

- M.Fk. Holston River - \$1.5 million Moderate Improvement
- Middle Ck. - \$400,000 - Definite Improvement
- North River -Some Improvement
- Blackwater River -\$700,000- Some Improvement
- Four Mile Run - Too early
- Quail Run - Definite Improvement

# Estimated total TMDL costs through 2010

**Over the past 5 years Virginia has spent an estimated \$10 million in TMDL development and implementation**

Total Costs through 2010	
Total estimated costs for Consent Decree TMDLs	\$5,065,000.00
Total estimated costs for Non Consent Decree TMDLs added to the 10 year schedule	\$429,000.00
Bacteria Source Tracking Costs	\$1,003,200.00
Staff	\$4,232,500.00
Total Costs for TMDL Development through 2010	\$10,729,700.00

# Cooperation is a Key to Success

- Stakeholder Groups have assisted in the successes seen in Virginia
- Important Southwest Stakeholder Groups Include:
  - Upper Tennessee River Roundtable
  - Boone Watershed Partnership
  - Beaver Creek Watershed Alliance
  - Guest River Group
  - Virginia/Tennessee Partnership involving Beaver Creek TMDL
  - Tennessee Valley Authority

# Contact Information

- TMDL Coordinator Southwest Regional Office

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- Virginia DEQ TMDL Website
  - <http://www.deq.state.va.us/tmdl/>