

ATTACHMENT C

**From “Rooftop to Bay” Workshop
Center for Watershed Protection & Chesapeake Stormwater Network
March 9 – 11, 2010, Staunton, VA**

PowerPoint Presentations:

**Session 5B: The Ball’s in Your Court
Part 2: Offsite Compliance/Trading**

**Stream Assessment and Watershed Management Program
Henrico County Department of Public Works**



Session 5B: The Ball's In Your Court – Part 2: Offsite Compliance/Trading

Kurt Stephenson, Virginia Tech

Doug Beisch, Williamsburg Environmental Group

Keith White, Henrico County, VA



Times, They Are a Changin'

New Control Requirements for Stormwater Quality and Quantity

- Ongoing revisions to state regulations
- Possible Changes to State Law
- Chesapeake Bay TMDL
- Proposed New Federal Stormwater Rule making

Session Overview

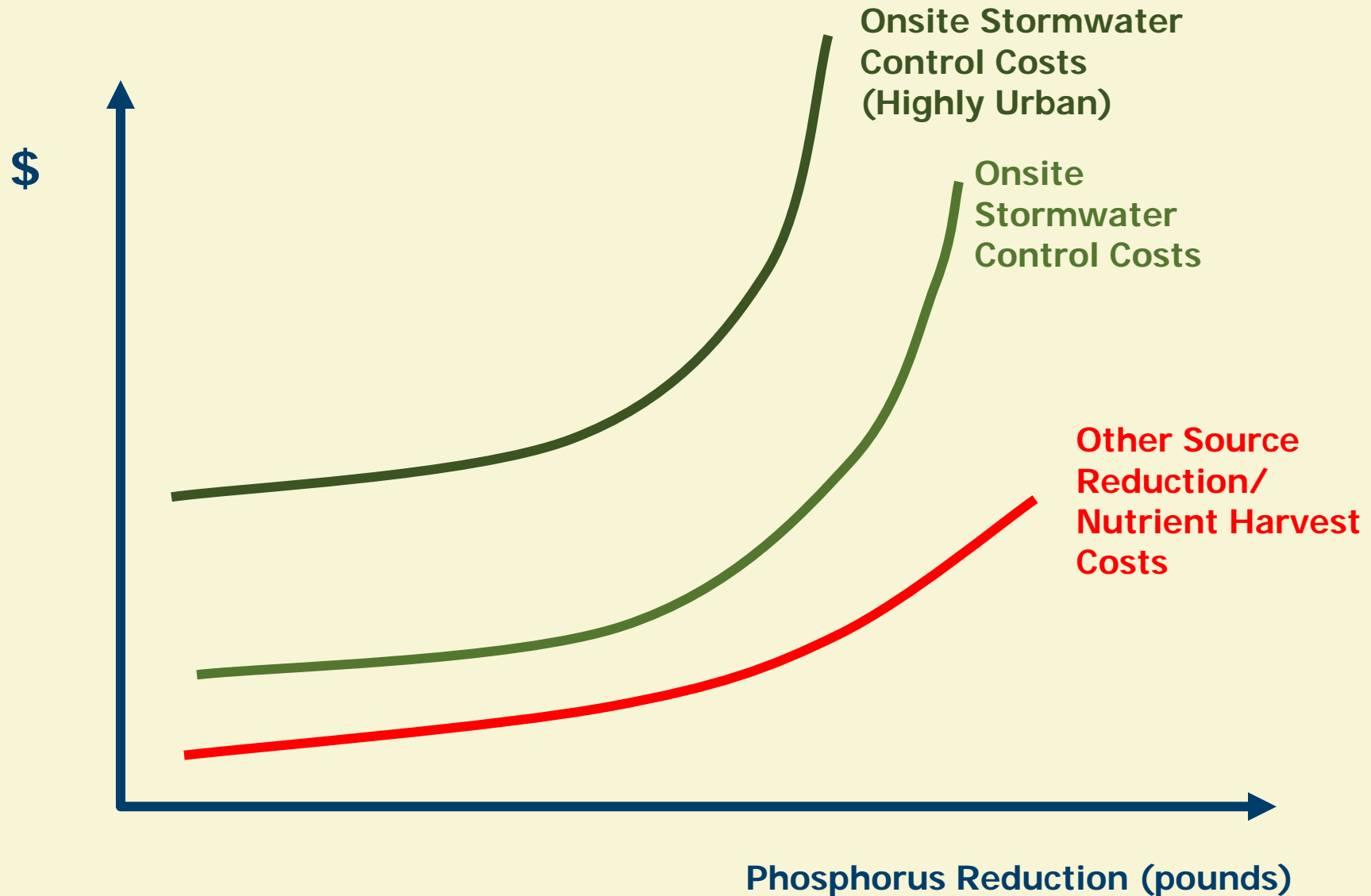
- Trading Programs Overview – Kurt Stephenson
- Trading, Offset & Buydowns – Offsite Compliance Regulatory Context – Doug Beisch
- Offsite Compliance Case Study – Keith White

Interest and Application of Trading

- Air Emissions (Clean Air Act)
- Carbon
- Wetlands
- EPA, Region, State Water Quality Trading

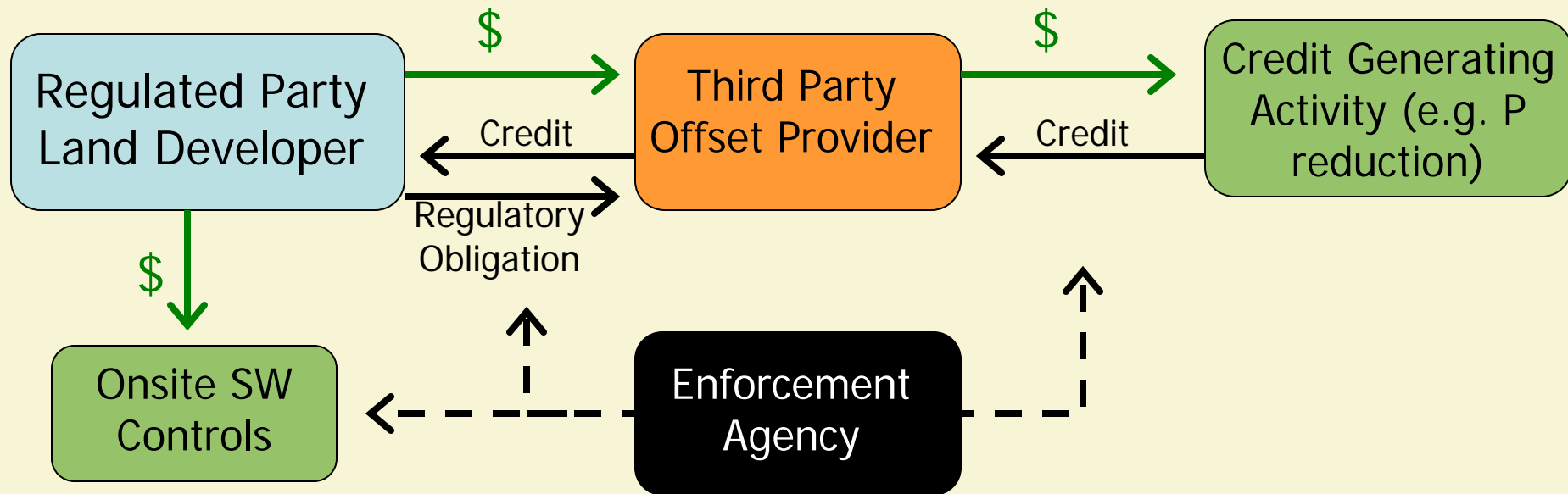
Trading programs have different motivations & exhibit a tremendous diversity of designs

The Changing Times Won't be Cheap

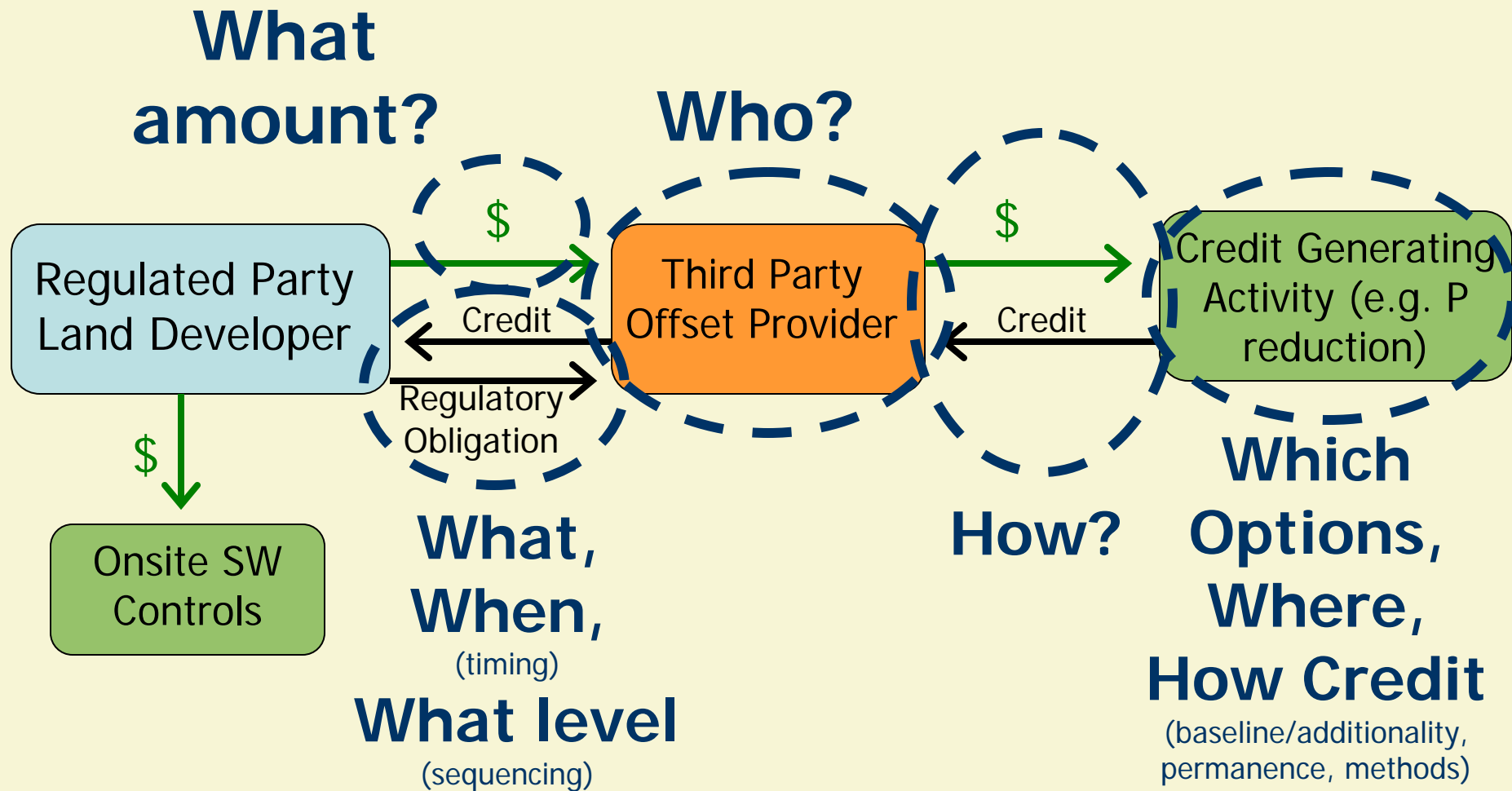


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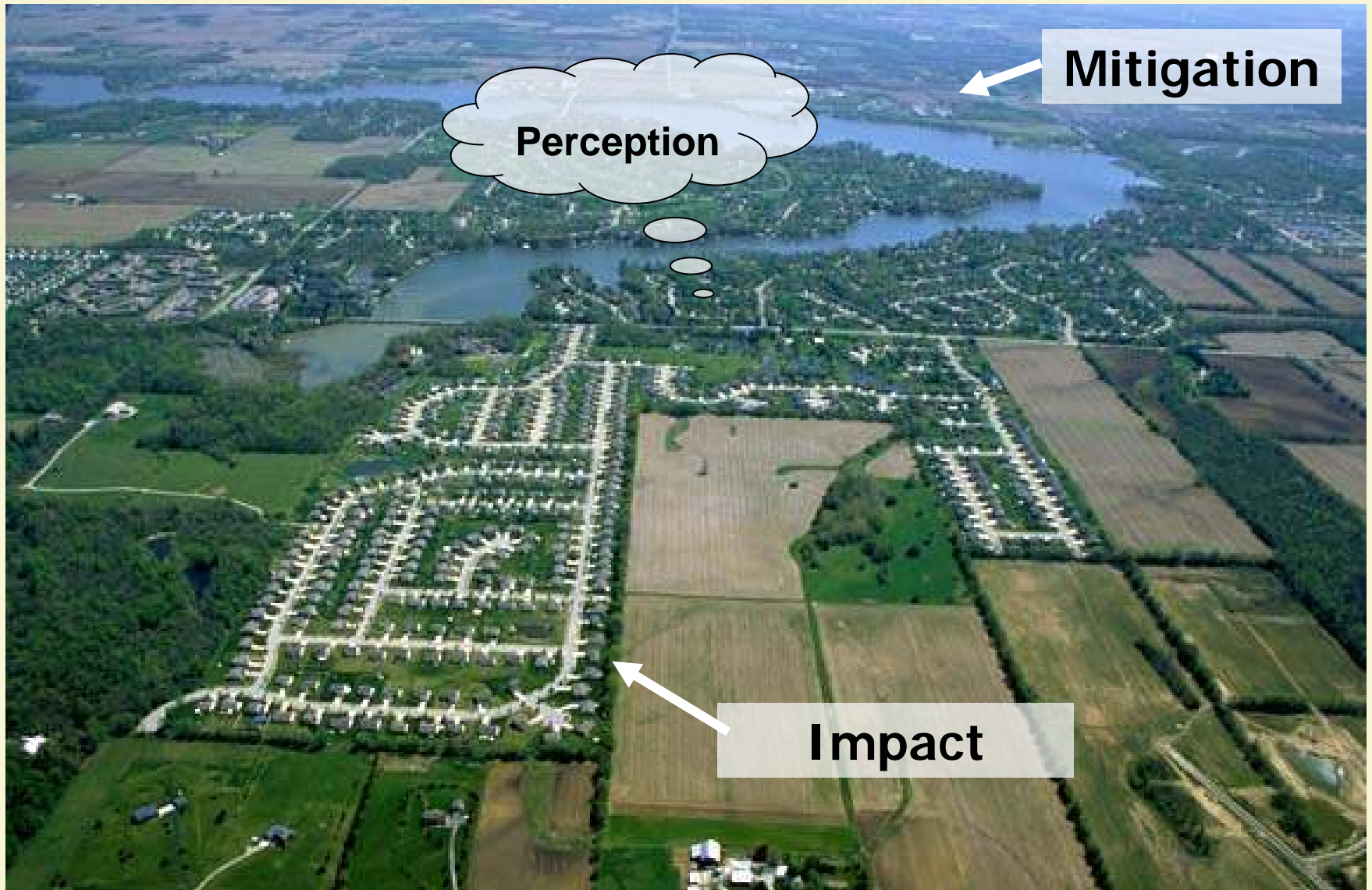
Managing Costs: Offsite Compliance



Offsite Compliance: Design Questions



Geographic Scale of Offsite Mitigation



From the Rooftop to the Bay, March 9 -11, 2010

Should We Implement an Offset Program?

Evaluative Criteria to Consider

- Cost
- Benefits
 - Cost reduction/savings
 - Opportunities for Innovation
- Risks
 - Financial risk
 - Temporal risk
 - Regulatory risk

Nutrient Trading in a Nutshell

- Local/Regional/National watershed protection/improvement initiatives
 - Ambitious surface water quality improvement targets
- Costs of on-site treatment are growing/disproportionate
- “Coin of the realm” varies
- Trading Programs are gaining favor throughout U.S.
- Credits derived from treatment, land conversion, reduction of existing discharges



PHOSPHORUS LOADS TO THE BAY BY STATE (Annually, in millions of pounds)			
State	1985	2008	Target
District of Columbia	1.26	0.14	0.13
Delaware	0.55	0.34	0.28
Maryland	6.27	3.10	3.04
New York	1.26	0.83	0.56
Pennsylvania	5.73	3.98	3.16
Virginia	12.42	7.18	7.05
West Virginia	0.93	0.72	0.62
Total	28.42	16.29	14.84

Driving Forces

- MS4 Retrofitting Objectives
- Watershed Restoration Objectives
- Ambitious Nutrient Reduction Goals
- Resource Restoration Goals
- Municipal Infrastructure Management
- Escalating On-site treatment costs
- Reliability
- O&M Costs
- TMDLs

Off-site Compliance Options (4VAC50-60-69)

1. Comprehensive Watershed Stormwater Management Plan (4VAC50-60-92)
2. Pro-rata Fee (Code of Virginia §15.2-2243)
3. Nonpoint Nutrient Offset Program (Code of Virginia § 10.1-603.8:1)
4. Operator Off-site Facilities
 1. Within HUC or Upstream HUC
 2. Only if 1 & 2 are not available
 3. Quantity on site and at off-site location
5. State Payment (*"buy down"*) – * * * * *
 1. Where 1/2/3/4 are not available, or:
 2. Where pro-rata fee exceeds \$23,900/lb TP

<http://dcr.virginia.gov/lr2d.shtml>

Credit Generation

- Regional Facilities
- Retrofit Programs
- Source Reduction/Pollution Prevention
- Agricultural Nutrient Trading
- Open Space Offset (TDR/PDR/etc.)
- Stream Restoration

Agricultural Nutrient Offsets

- DCR Policy Guidance – July, 2009
- DEQ Agricultural Trading Guidance
- Offset Credit Generation generally constrained to Land Conversion
- Service area defined (similar to mitigation banking)
- Only one bank in place
 - (Appomattox County)

www.deq.virginia.gov/vpdes/nutrienttrade.html



Trading Nutrient Reductions from Nonpoint Source Best Management Practices in the Chesapeake Bay Watershed: Guidance for Agricultural Landowners and Your Potential Trading Partners



Stream Restoration/Stabilization

- Established precedent in VA (Henrico, SWM Regs “buydown” reference)
- Additional studies underway
- Component of Bay Model
- Incentivizes urban SR
- Credit determination:
 - Sediment wedge method (CEM)
 - BEHI/Sampling
 - Sed. Transport modeling
 - Physical Sampling
 - Comparative Studies



Pre-Restoration (Station 25)



Post-Restoration (Station 25)

Stormwater Retrofitting

- Costs may range widely
 - Small Scale Retrofits
 - Large Pond Retrofits
 - “LID” Retrofits
- Typical costs:
\$10,000-\$40,000/lb/acre
- CWP has valuable retrofit resources on the web



Non-traditional Credit Opportunities

- Land/Mine Reclamation
- Pollution Abatement
- Nutrient Management
- Large scale ecological improvements
(constructed/created wetland complexes)



Examples from Around the Country

Henrico County, VA	\$8,000/lb of P
Maine	\$25,000/lb of P
Neuse River, NC	\$11/lb of N
Austin, TX	\$35K -- \$60K/acre of impervious + land acquisition
MD Critical Area	\$38,400/lb of P

Offset Program Structure

- Evaluate Local Watershed Protection Objectives
- Establish “Baseline” Practices
- Identify Credit Demand/Availability
- Develop Program Trading Structure
 - Delivery Ratios
 - MOS
 - Credit/Debit Ledger
 - Assurances/Banking Process

Typical Steps to Set Up An Offset Program

- Step 1 – Ordinance & Policy: which sites are eligible, scale of trading, etc.
- Step 2 – Administrative Set-Up: collecting, tracking, and spending \$\$\$
- Step 3 – ID specific projects & costs: retrofits, restoration, land preservation, etc.
- Step 4 – Set rate for unmet load: e.g., \$/pound of P
- Step 5 – Start banking, tracking & building (or build and then bank)

Challenges

- Funding/Startup Costs
- Perception Issues
- Planning
- Permitting
- Implementation
- Tracking and Administration
- Monitoring and Maintenance

Private Sector Involvement

- Leverage Venture Capital – Private Investment for Public Benefit
- Formalize Process for Participation and Verification
 - Prospectus
 - Banking Instrument
 - Success Criteria
 - Financial Assurances
 - Trading Guidelines
 - Credit and Debit Administration

VA Soil and Water Conservation Board GUIDANCE DOCUMENT ON STORMWATER NONPOINT NUTRIENT OFFSETS

http://www.townhall.virginia.gov/L/GetFile.cfm?File=E:\townhall\docroot\GuidanceDocs\199\GDdoc_DCR_4007_v1.pdf

Small Group Discussions

- Is it a good idea?
- Who benefits? Developers, local program, water resources?
- Worth administrative burden?
- Best practices to use?
- Right for your community?

STREAM ASSESSMENT AND WATERSHED MANAGEMENT PROGRAM

Henrico County
Department of Public Works
Engineering and Environmental Services Division



Why develop a comprehensive stormwater management program?

The Problems

State and federal regulations require stormwater management on development activities

Site-by-site compliance often led to small, ineffective, and sometimes very expensive BMPs

Site-by-site compliance did not address existing problems in the watershed

The County's Solution

Evaluate the needs of watersheds throughout the County

Provide more cost effective alternatives for development while still meeting intent of water quality requirements

Provide a funding mechanism for correcting existing problems in the watershed

Site-by-Site approach resulted in numerous small and ineffective BMPs



Limited Drainage Areas
Maintenance Issues
Mosquito Breeding Habitat

Aesthetic Concerns
Property Values
Safety Concerns



Site-by-Site requirements were costly on a per pound basis

- Redevelopment within built-out areas:
 - Removal Requirement low compared to pollutants generated by overall watershed
 - Program does not encourage redevelopment (relative to water quality) due to relatively high BMP cost



Site-by-Site approach did not address existing problems



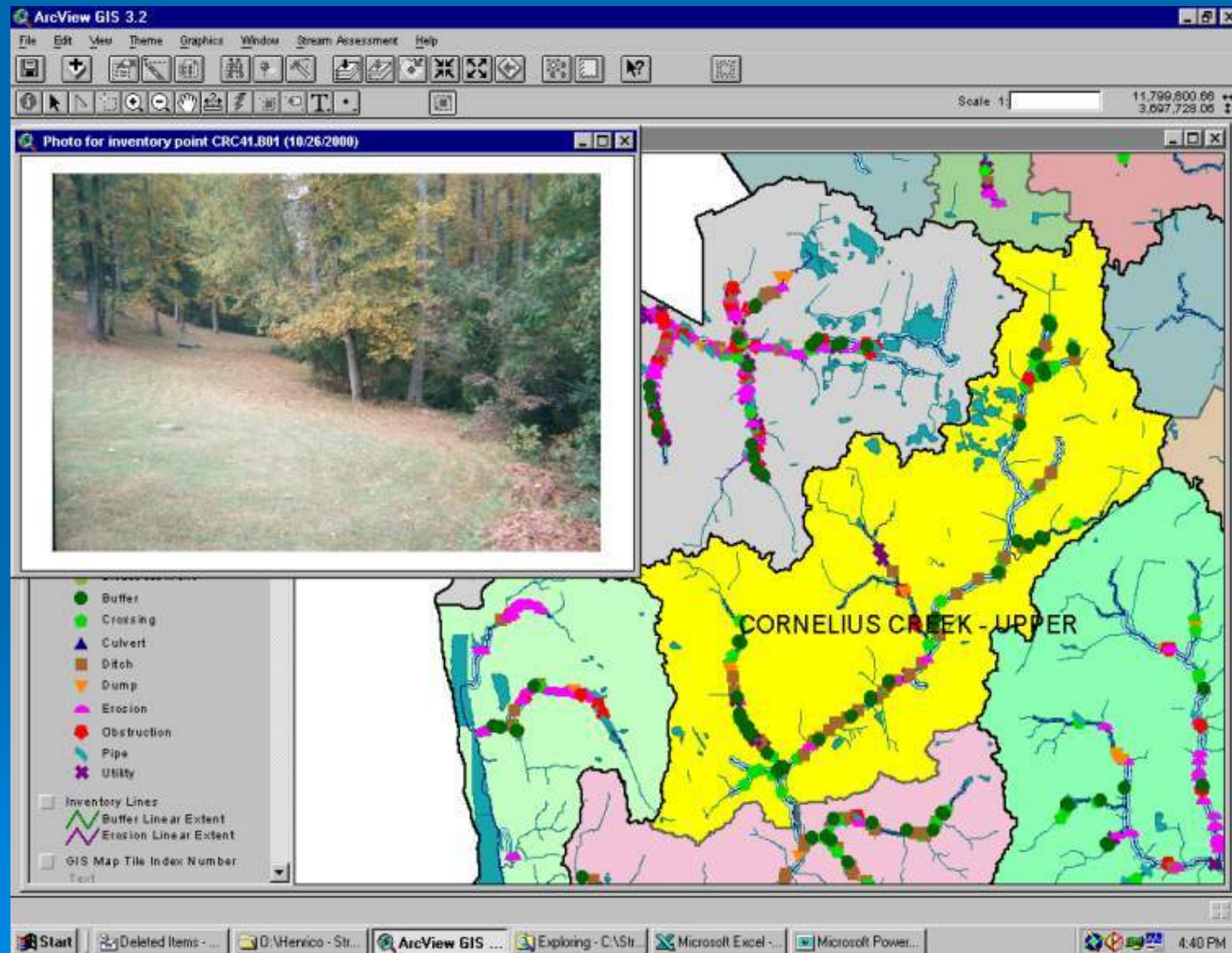
The County's Comprehensive Approach

- Step back from site-by-site
- Assess the condition of the streams
- Base water quality requirements on the needs of the streams

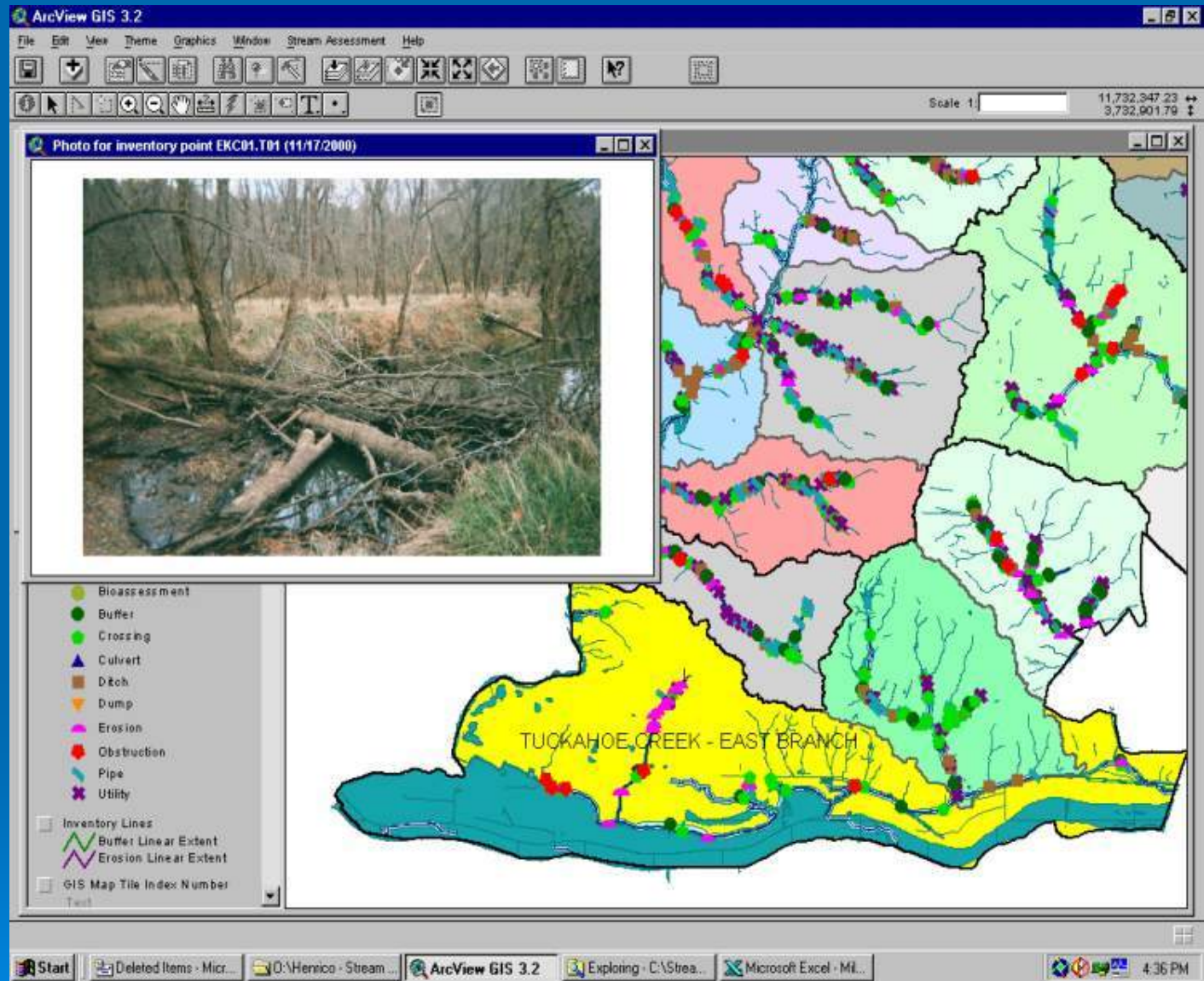


In 2000, the County evaluated 440 miles of streams and...

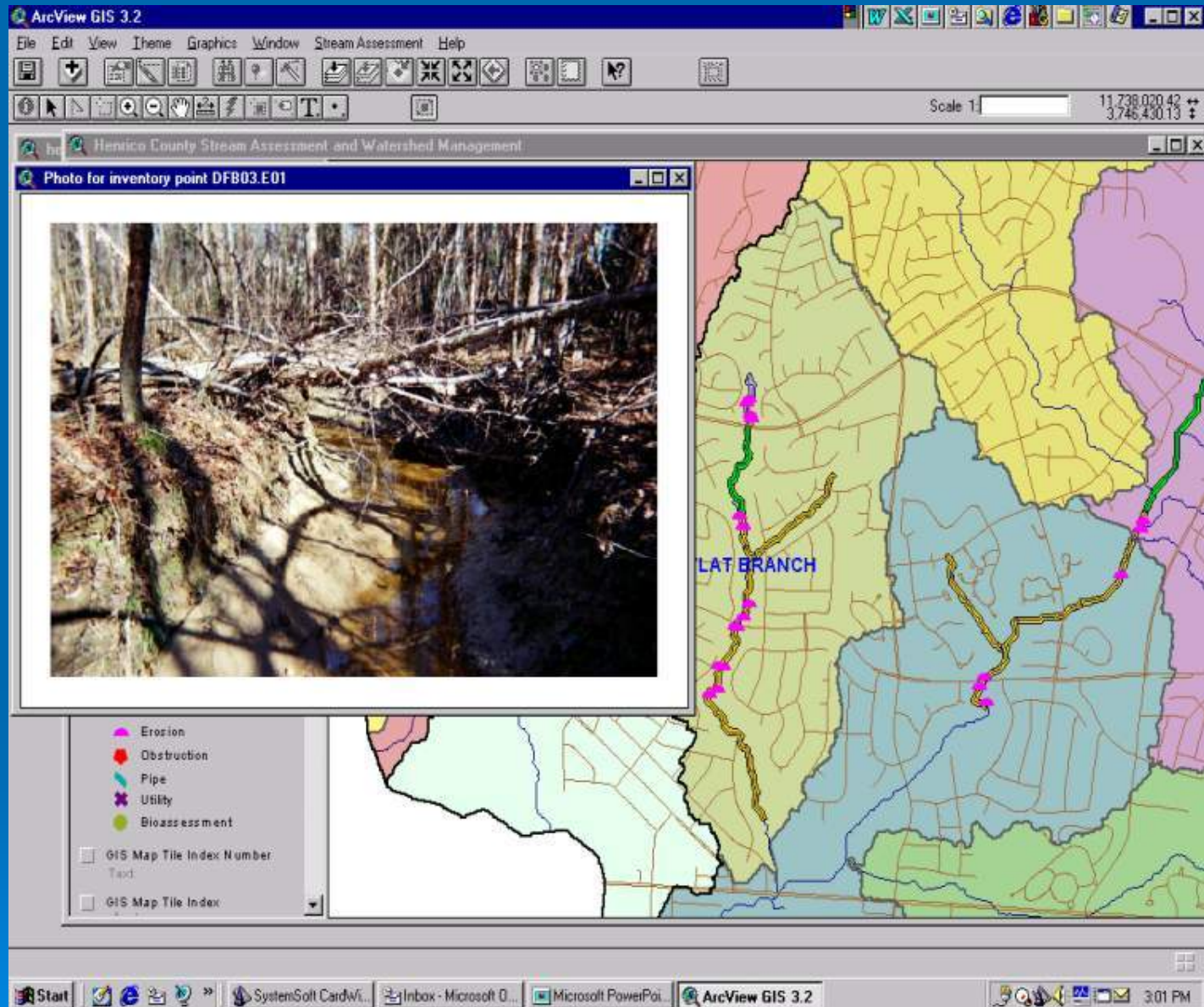
Identified over 69.4 miles where a streamside buffer was not present



Identified over
97 stream
obstructions
causing
significant
impacts to
stream



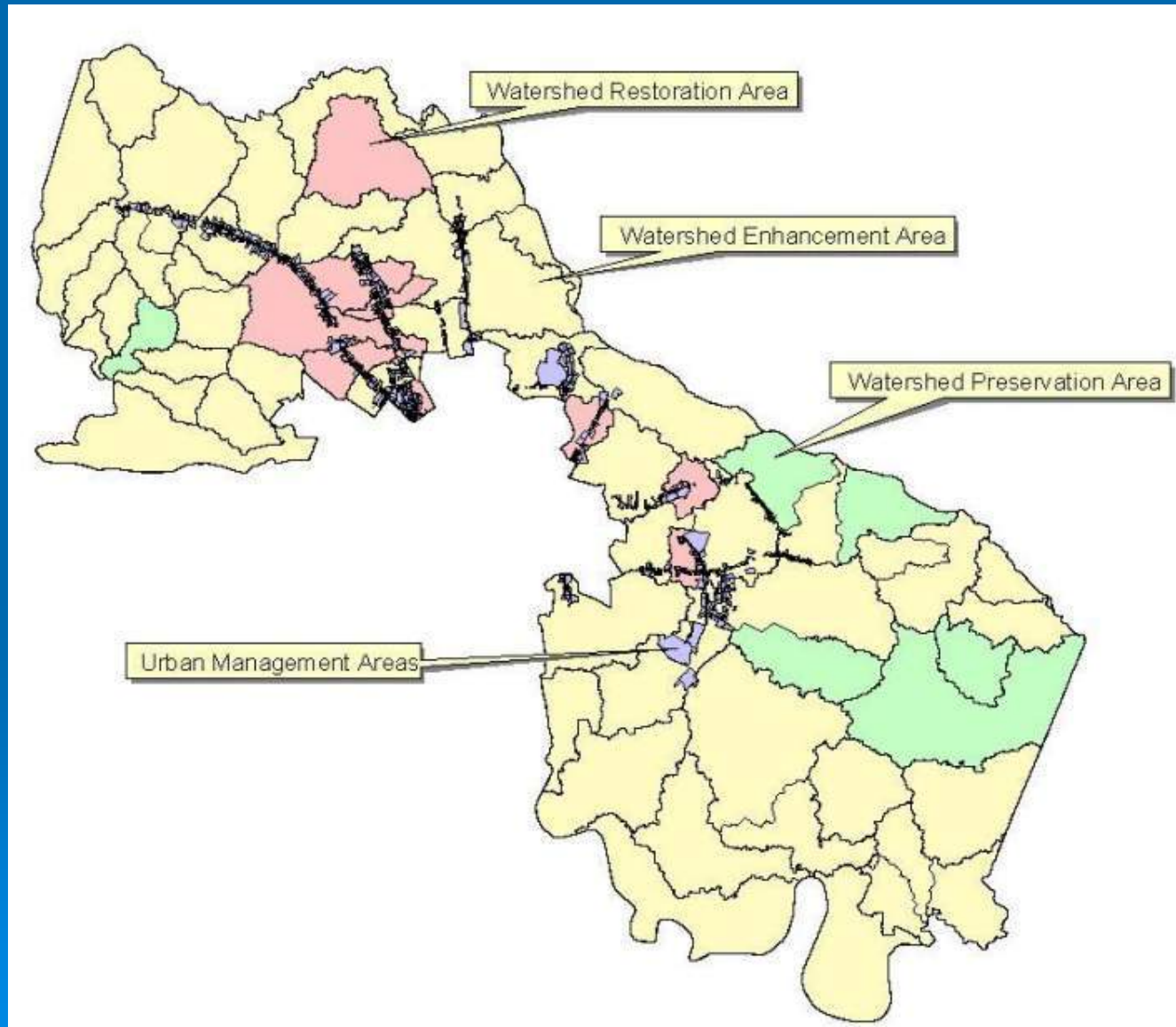
Identified 478
sections of
streambank
that were
experiencing
significant
erosion



Watershed Management Areas

- Used assessment data to score reaches and divide watersheds into management areas
 - Watershed Preservation Areas
 - Watershed Enhancement Areas
 - Watershed Restoration Areas
- Create 4th group based on existing developed corridors
 - Urban Management Areas

Watershed Management Areas



Watershed Management Areas

➤ Watershed Preservation Areas

- Streams are typically in good condition
- Few corrective actions are needed in the streams in these watershed
- BMPs are required

➤ Watershed Enhancement Areas

- Streams are in fair condition
- Corrective actions are needed in the watershed
- Development may qualify to pay into the Environmental Fund in lieu of a BMP

Watershed Management Areas

➤ Watershed Restoration Areas

- Streams are in poor condition
- Extensive corrective actions are needed in the watershed
- Development may qualify to pay into the Environmental Fund in lieu of a BMP

➤ Urban Management Areas

- Corridors of intensely developed sites
- Streams are in fair to poor condition
- Extensive corrective actions are needed in the watershed
- Development will be required to pay into the Environmental Fund

Watershed Projects

- The Environmental Fund is used to:
 - Conduct stream restoration projects
 - Restore riparian buffers
 - Stabilize eroding streambanks
 - Develop educational materials/programs



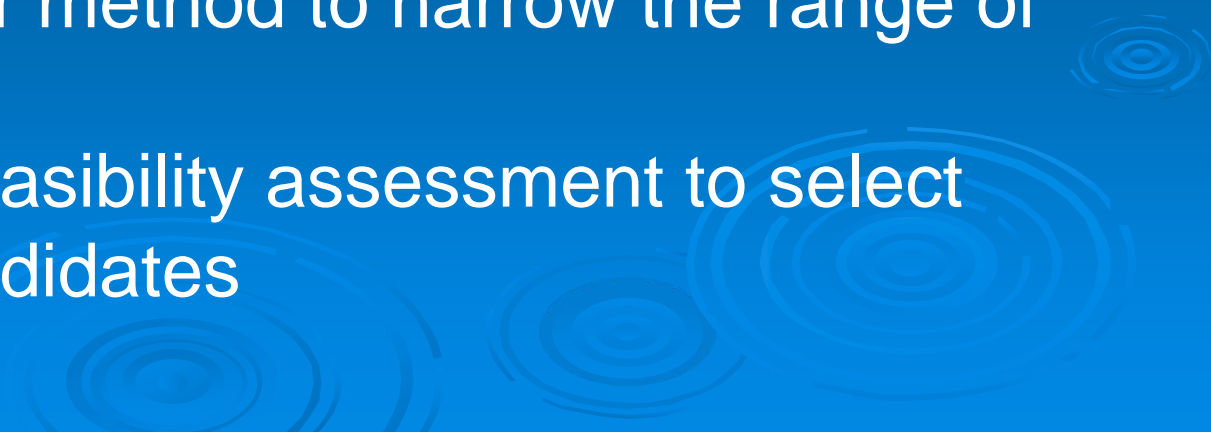
Watershed Management Program

- Water Quality Requirements are now based on site specific data PLUS the health of the streams in the watershed
- Our Program allows us to take money that would have been spent on ineffective BMPs and apply that to watersheds that need repair
- Through a Watershed approach, we have added Stream Restoration to our Water Quality Requirements

Prioritizing Stream Restoration Projects

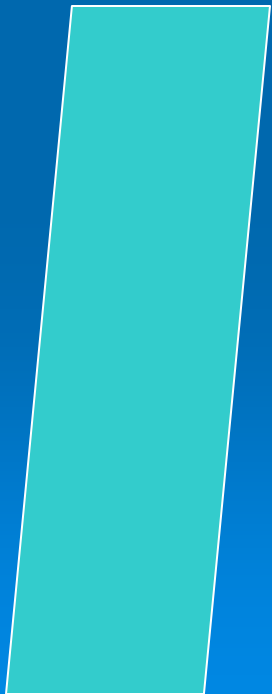
Approximately 900 stream reaches were identified during the stream assessments

Which stream reaches are the best candidates for stream restoration projects?

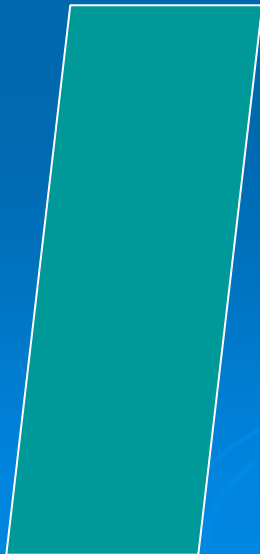
1. Use filter method to narrow the range of choice
 2. Use a feasibility assessment to select final candidates
- 
- The background of the slide features several concentric, light blue circular ripples that resemble water droplets or stones thrown into a stream, positioned primarily in the lower right and bottom center areas.

The Prioritization Process

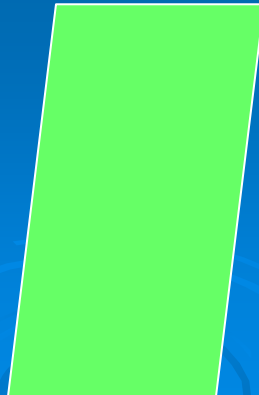
Watershed
Impervious
Surface



Habitat
Score



Upstream
Impacts



Inventory
Data

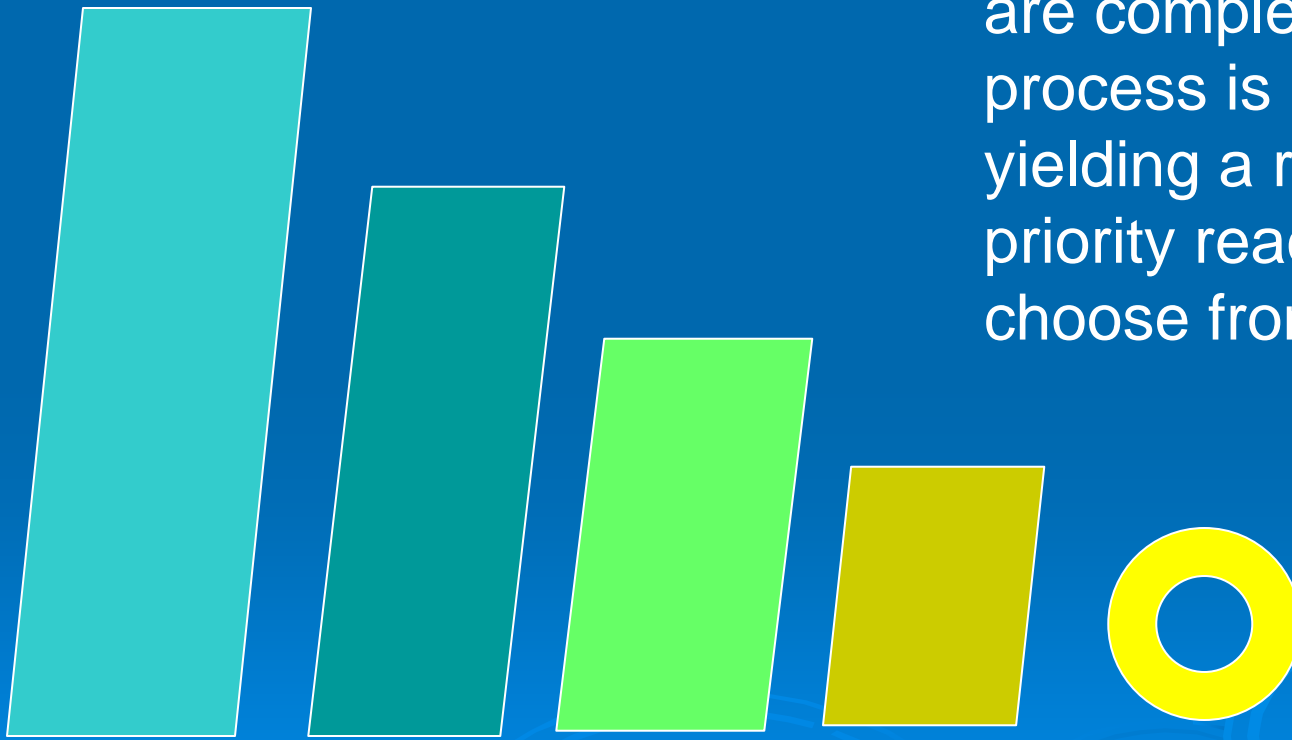


Feasibility
Assessments



An Iterative Process

After several projects are completed, the process is repeated, yielding a revised list of priority reaches to choose from



Jamestown Apartments Stream Restoration Project

- Drainage area of approximately 100 acres
- Predominant land use is older single family residential (approximately 35% impervious)
- Eroding channel threatened buildings and parking areas
- Project consisted restoring approximately 1400 feet the stream using natural channel design concepts
- Also restored significant lawn area to a riparian buffer
- Design: \$78,000 / Construction: \$236,000









Henrico Communications Stream Restoration Project

- Drainage area of approximately 125 acres
- Predominant land use is retail / commercial (approximately 60% impervious)
- Project consisted restoring approximately 1400 feet the stream using natural channel design concepts
- Approximately 700 feet of the restored channel was along new alignment
- Also included a walking trail and interpretive signage (Design: \$40,000 / Construction: \$166,000)
- Design: \$135,000 / Construction: \$490,000











Keith O White, P.E.
Senior Engineer
Engineering and Environmental Services Division
Henrico County Department of Public Works

P.O. Box 90775
Henrico, Virginia 23273
(804) 501-7475
whi24@co.henrico.va.us

[http://www.co.henrico.va.us/departments/works/engineering---
environmental-services/](http://www.co.henrico.va.us/departments/works/engineering---environmental-services/)