An ounce of prevention is worth a pound of cure (and millions of dollars in savings):

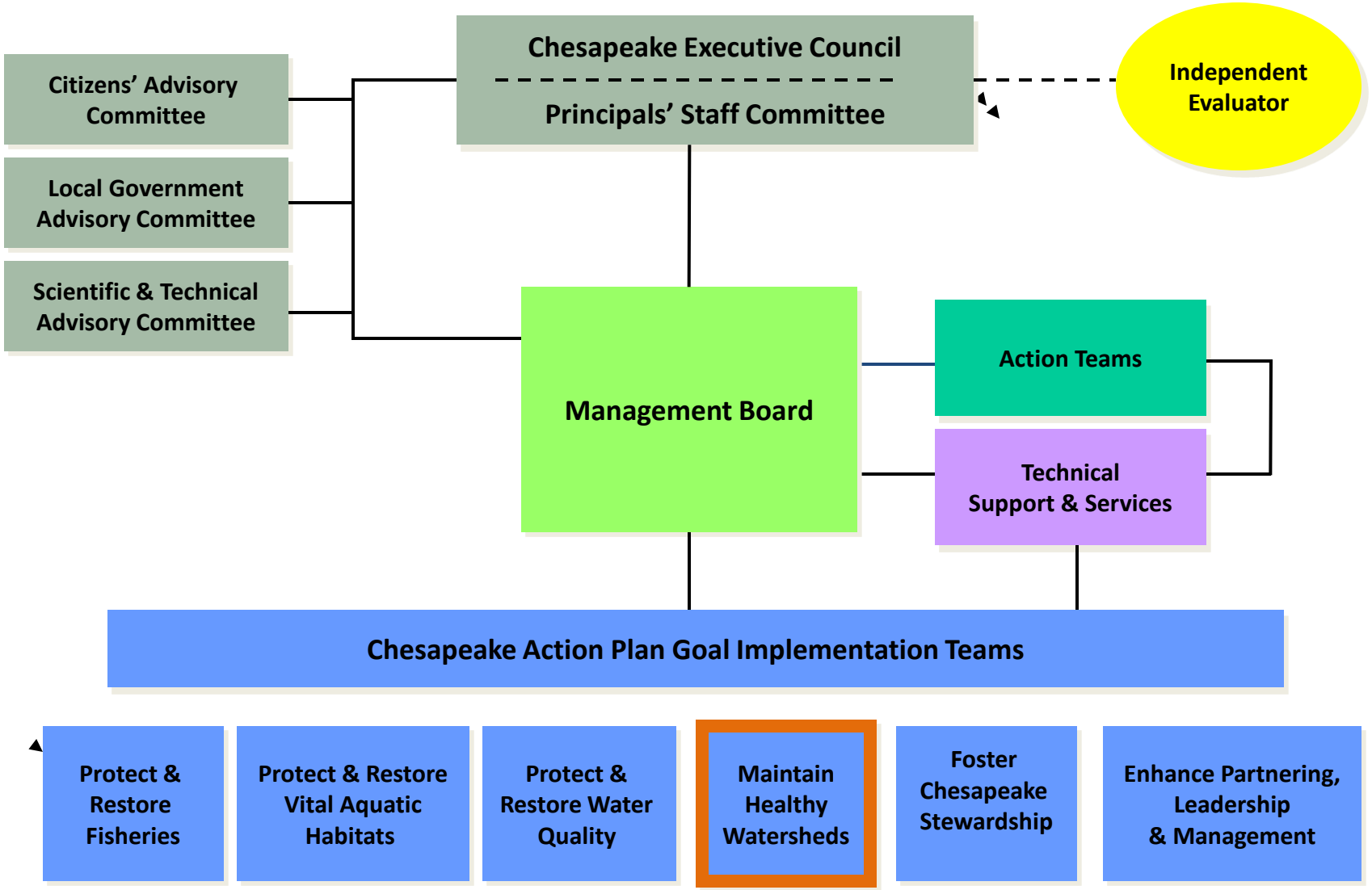
Balancing our investment in the Chesapeake by maintaining healthy watersheds

September 6, 2012

Mark Bryer
The Nature Conservancy
Chair, Healthy Watershed Goal Team


DA Farm Service Agency, PA Department of Conservation and Natural Resources-PAMAP/USGS, GeoEye, U.S. Geological Survey - Terms

CBP Organization Chart



Committee membership

- State agencies
  - MD Department of Planning (Vice Chair) and DNR, MDE, PA DEP and DCNR, VA DEQ and DCR, Chesapeake Bay Commission, DC DOE, NY DEC
- Federal agencies
  - EPA, USGS, USFWS, USFS, NRCS, NPS, DOD
- Academic
  - VCU, VA Tech
- Non-profits
  - The Conservation Fund, Chesapeake Bay Foundation, American Farmland Trust, Trust for Public Land, The Nature Conservancy

Maintain Healthy Watersheds Goal Implementation Team

Goal: Maintain local watershed health across a range of landscape contexts

What is a Healthy Watershed?

There are many ways to define a healthy watershed, here are a few examples:

EPA Healthy Watershed Initiative Definition

- Natural land cover
- Sufficient habitat
- Aquatic/riparian connectivity
- Natural, dynamic hydrologic and geomorphic processes

State Classifications

- Water quality
- Good benthic index of biotic integrity score (BIBI)
- Antidegradation designations

Why focus on healthy watersheds?

Balanced investment strategy - Restoration of the Bay depends on the protection of resource lands that maintain watershed health.

Cheaper than restoration - protecting what's still good is far more cost effective than trying to restoring it.

Meaningful "up-watershed" - majority of people in the watershed connect to the health of their local streams, not the Bay.

Benefits of Healthy Watersheds

Healthy watersheds provide:

- Clean water for healthy ecosystems and human use
- Habitat for fish and wildlife
- Recreation opportunities
- Increased quality of life
- Better adaptation to climate change and land use change
- Nutrient cycling
- Carbon sequestration
- Economic benefits

An ounce of protection…

Economic benefits of protecting Healthy Watersheds

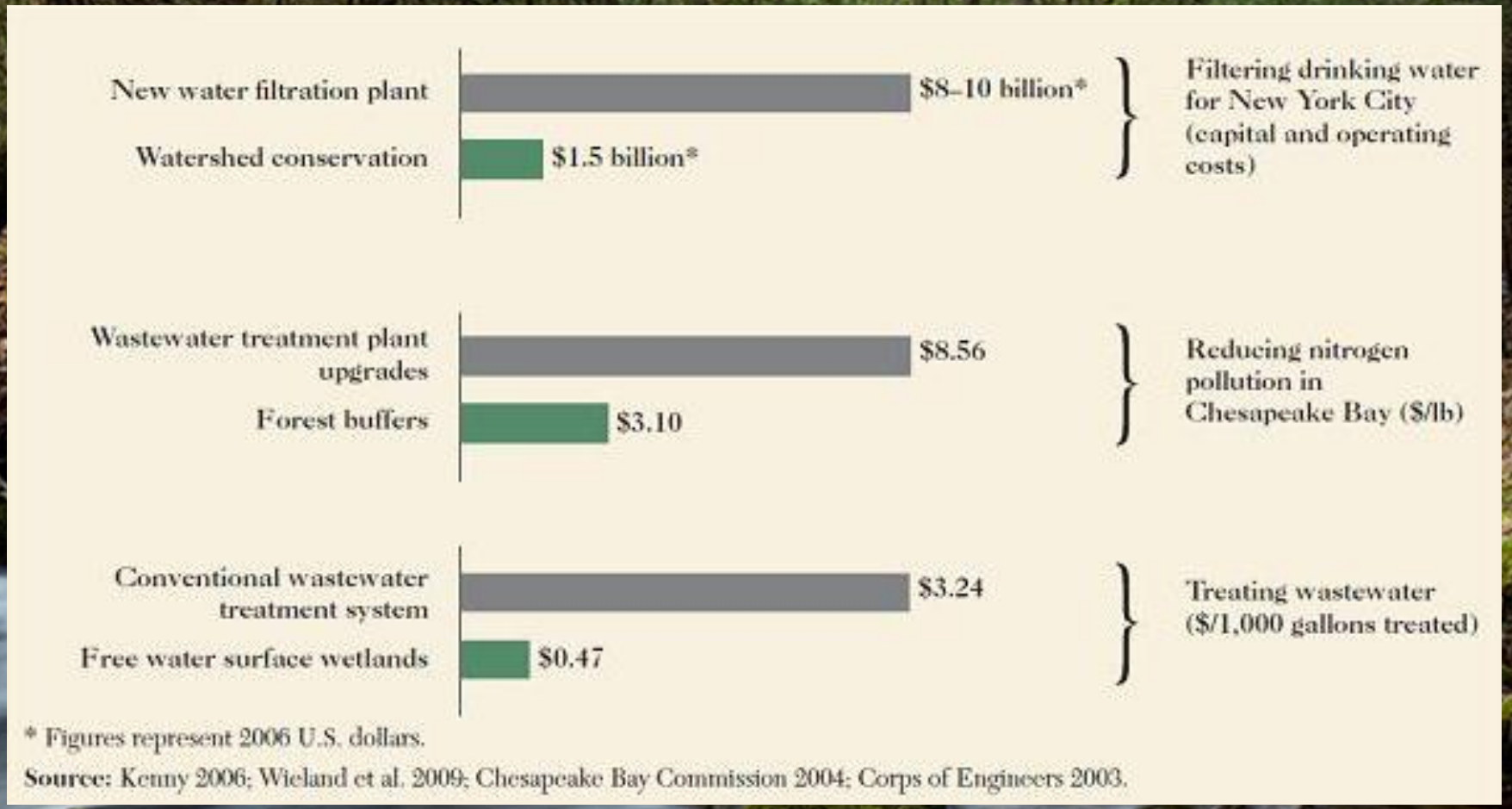
- Lower water treatment costs
- Flood mitigation
- Fishing, boating, eco-tourism
- Increased property values

The challenges and costs of restoring these services are often much greater than the costs of protecting them.

Economics of protection

- For every 10% increase in forest cover of source drinking water area, treatment costs decreased by 20% (Earnst, C., 2004)
- In PA, homes near green space are worth 30% more ($16.3 billion)
- Existing wetlands surrounding Boston have been valued at $72,000 per hectare pre year based on the cost avoidance they provide by preventing flood damage (Myers 1996)

Economics of protection



* Figures represent 2006 U.S. dollars.

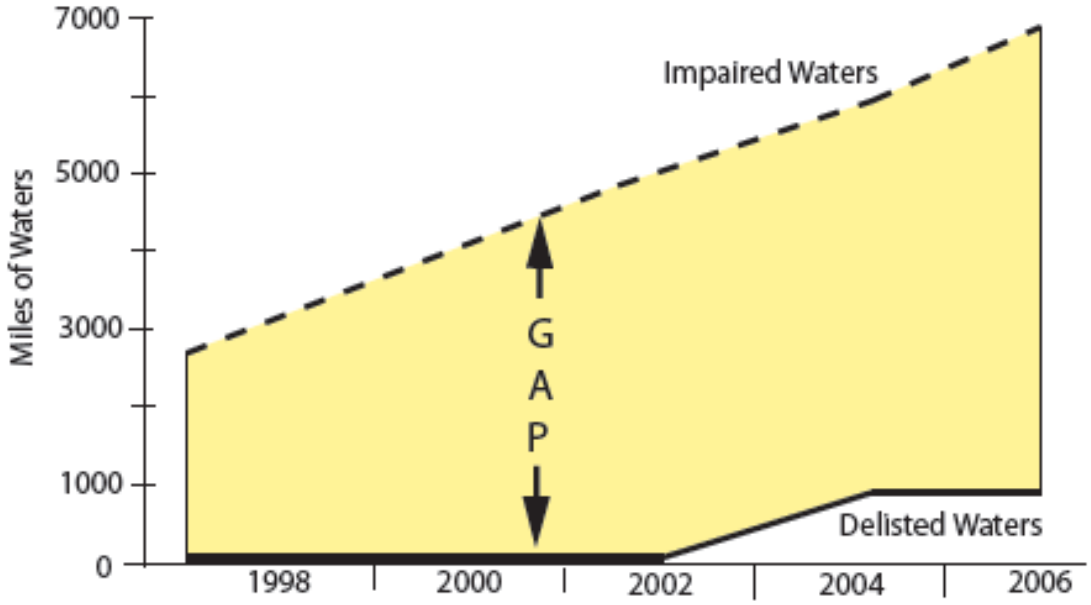
Source: Kenny 2006; Wieland et al. 2009; Chesapeake Bay Commission 2004; Corps of Engineers 2003.

Maintaining HW: How are we doing?

- We don't exactly know…but we do know:
  - We have a snapshot of current health based on bugs in our streams
  - The number of impaired streams is increasing
  - We don't know how effective management interventions are at keeping our streams healthy

Restoration is not an easy answer

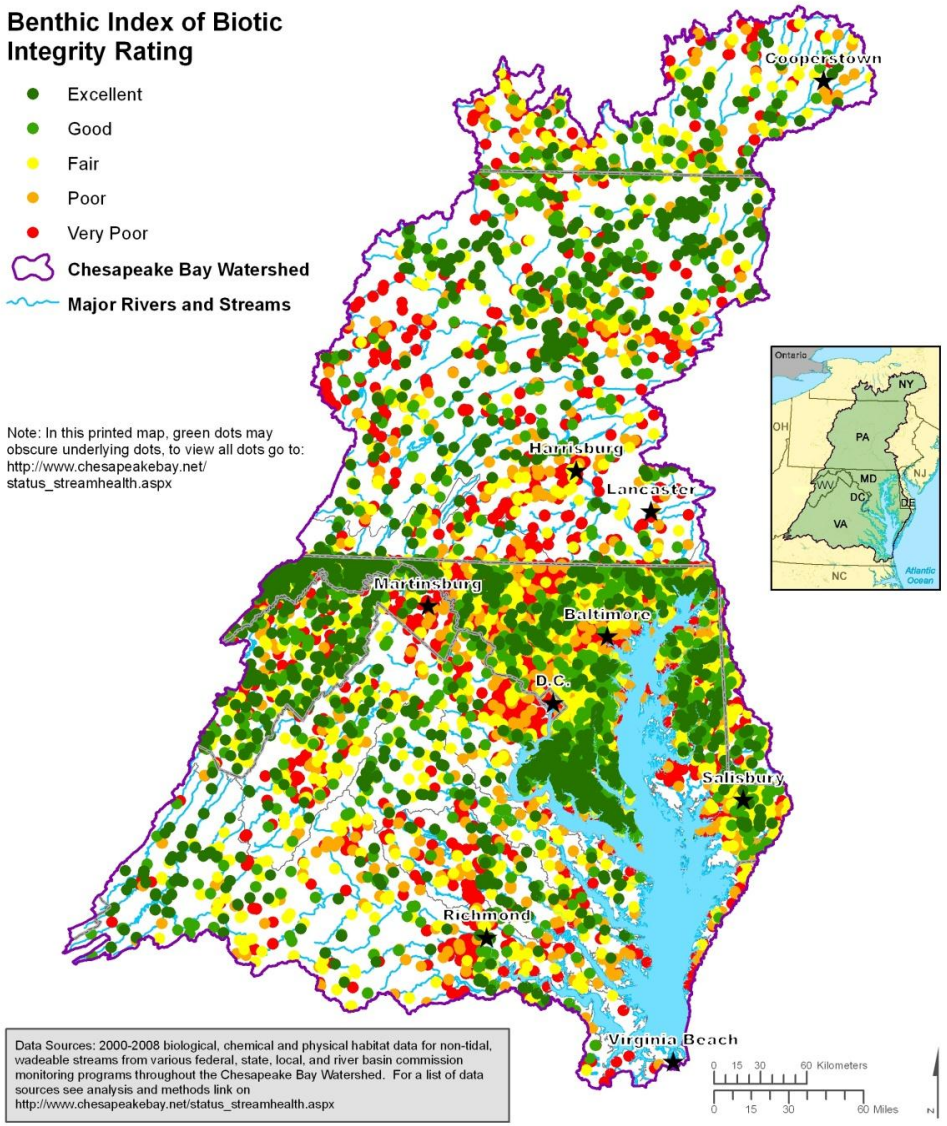
The cost of repairing damaged ecosystems is high and has a low success rate



Gap between impaired and restored waters in EPA Region 3.

Average 2000-2008 Stream Health in the Chesapeake Bay Watershed

Chesapeake Bay Program
A Watershed Partnership

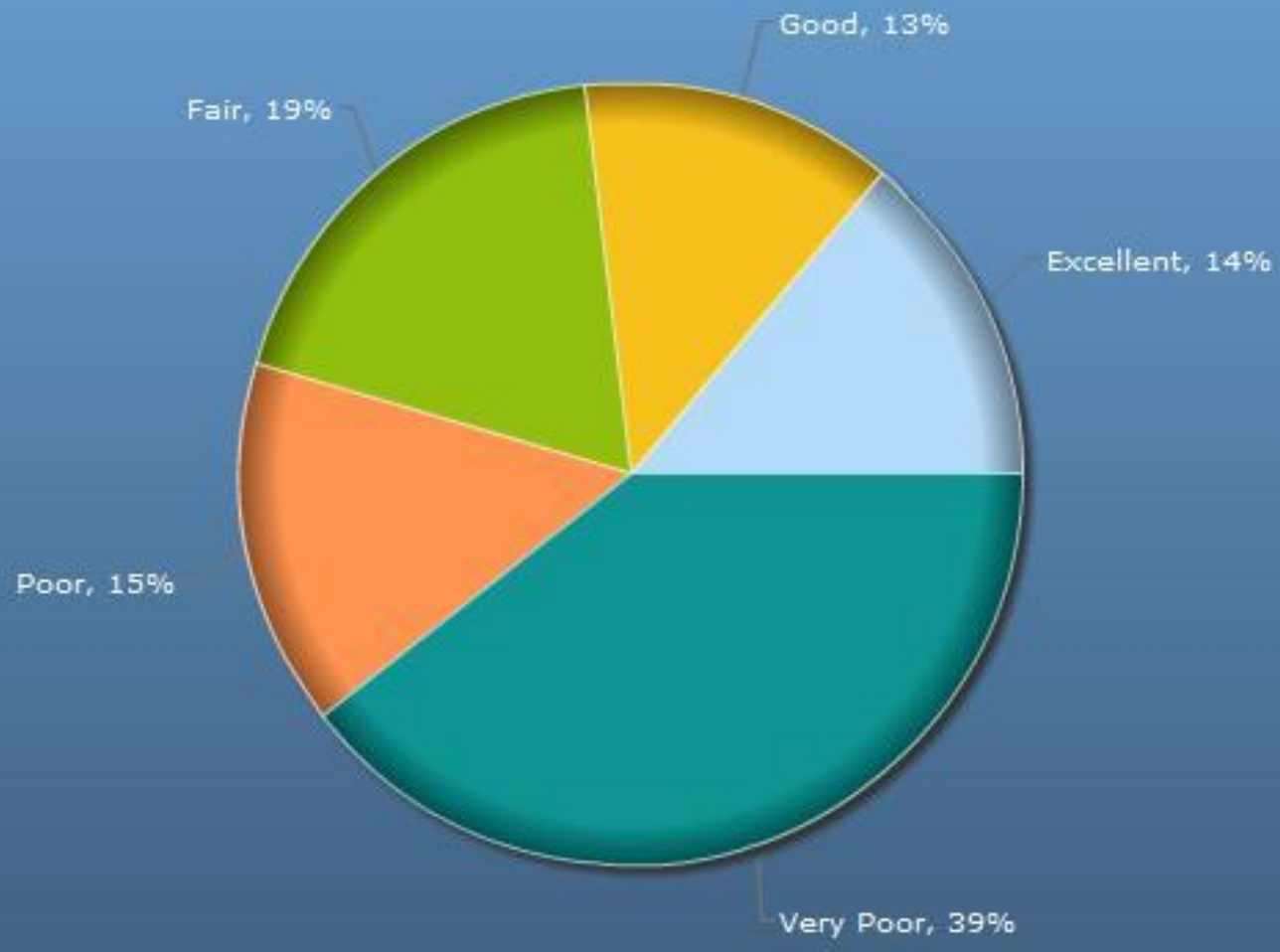


Created by FMI, 03/07/2011

UTM Zone 18N, NAD 83

Stream Health, 2000-2008

Average Benthic Index of Biotic Integrity Rating of 7,886 Random Design Monitoring Sites



Presidential Executive Order:

Improve the health of streams so that 70% of the streams throughout the Chesapeake watershed have quality that is fair or better by 2025.

Current condition: 45% are fair, good or excellent.

So, in other words, in the next 13 years:

- Restore 25%

  and

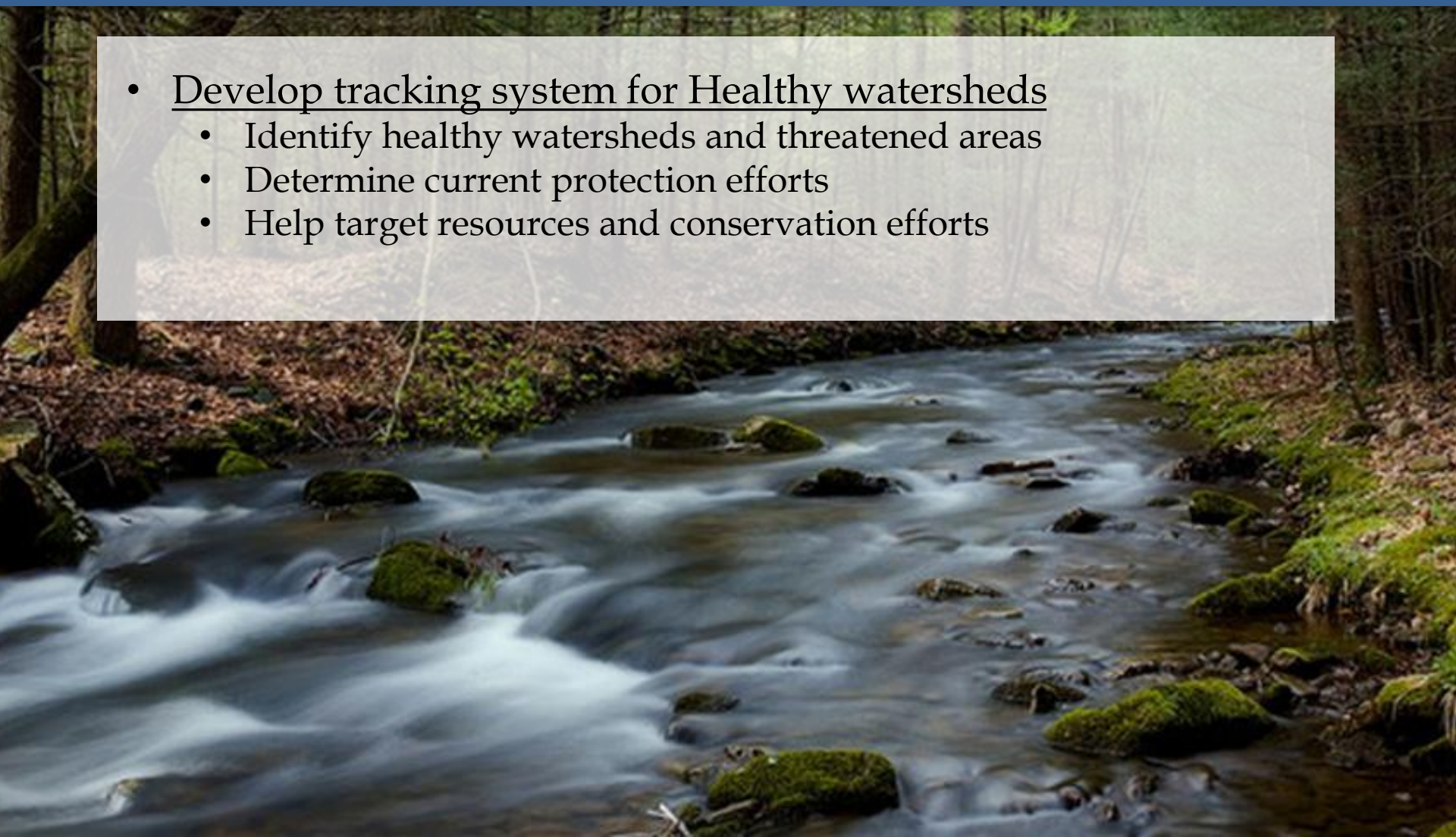
- Don't lose any of the current 45%!!

An essential role for Maintaining Healthy Watersheds

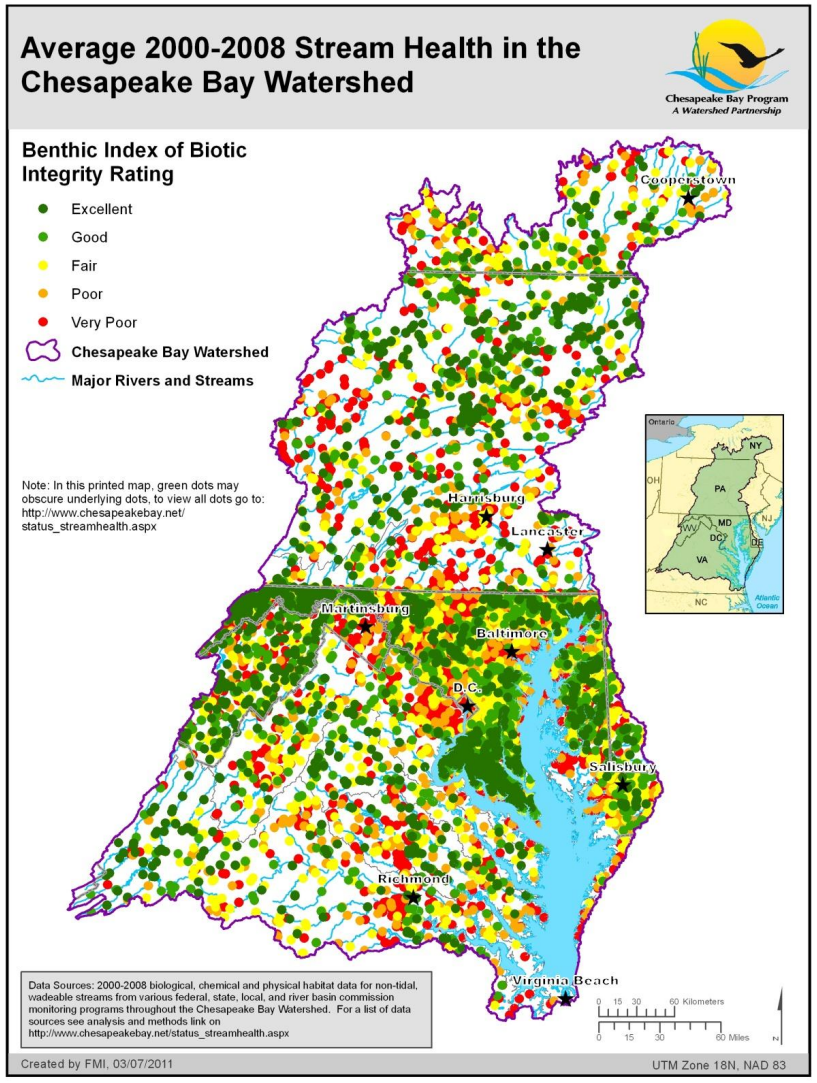
Why do we need a balanced strategy of protection and restoration?

- Ecosystem services provided by *healthy watersheds* are expensive or even impossible to replace
- Restoration is expensive and not always effective, although necessary
- Ultimately, if healthy watersheds are degraded or lost, the price tag for Bay recovery goes up and the "reasonable assurance" of success goes down

What's GIT4 doing?



- Develop tracking system for Healthy watersheds
  - Identify healthy watersheds and threatened areas
  - Determine current protection efforts
  - Help target resources and conservation efforts



1. Where are the healthy watersheds?

2. Which healthy watersheds are at the greatest risk of being degraded?

3. What management actions are we taking to protect healthy watersheds, and are they working?

What's GIT4 doing?

- Develop tracking system for Healthy watersheds
  - Identify healthy watersheds and threatened areas
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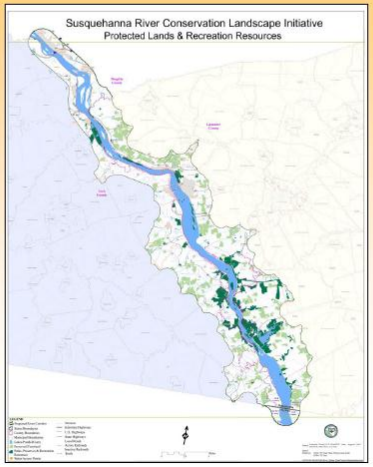
  - Help target resources and conservation efforts

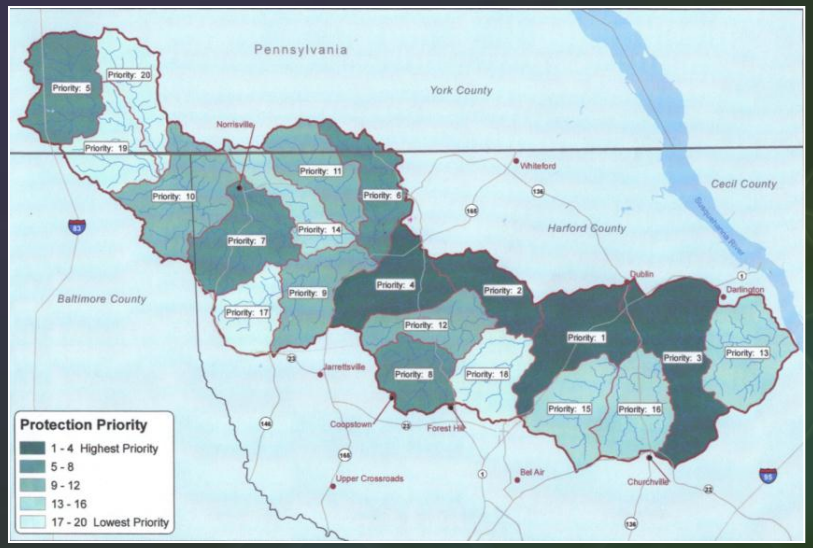
- Advocacy communications
  - Create forum for discussion and information sharing about what works
    - Compile and publish case studies, existing state programs, including anti-degradation
    - Track at the 2012 Watershed Forum

Sharing knowledge

Susquehanna River Landscape Conservation Initiative



Deer Creek – PA/MD



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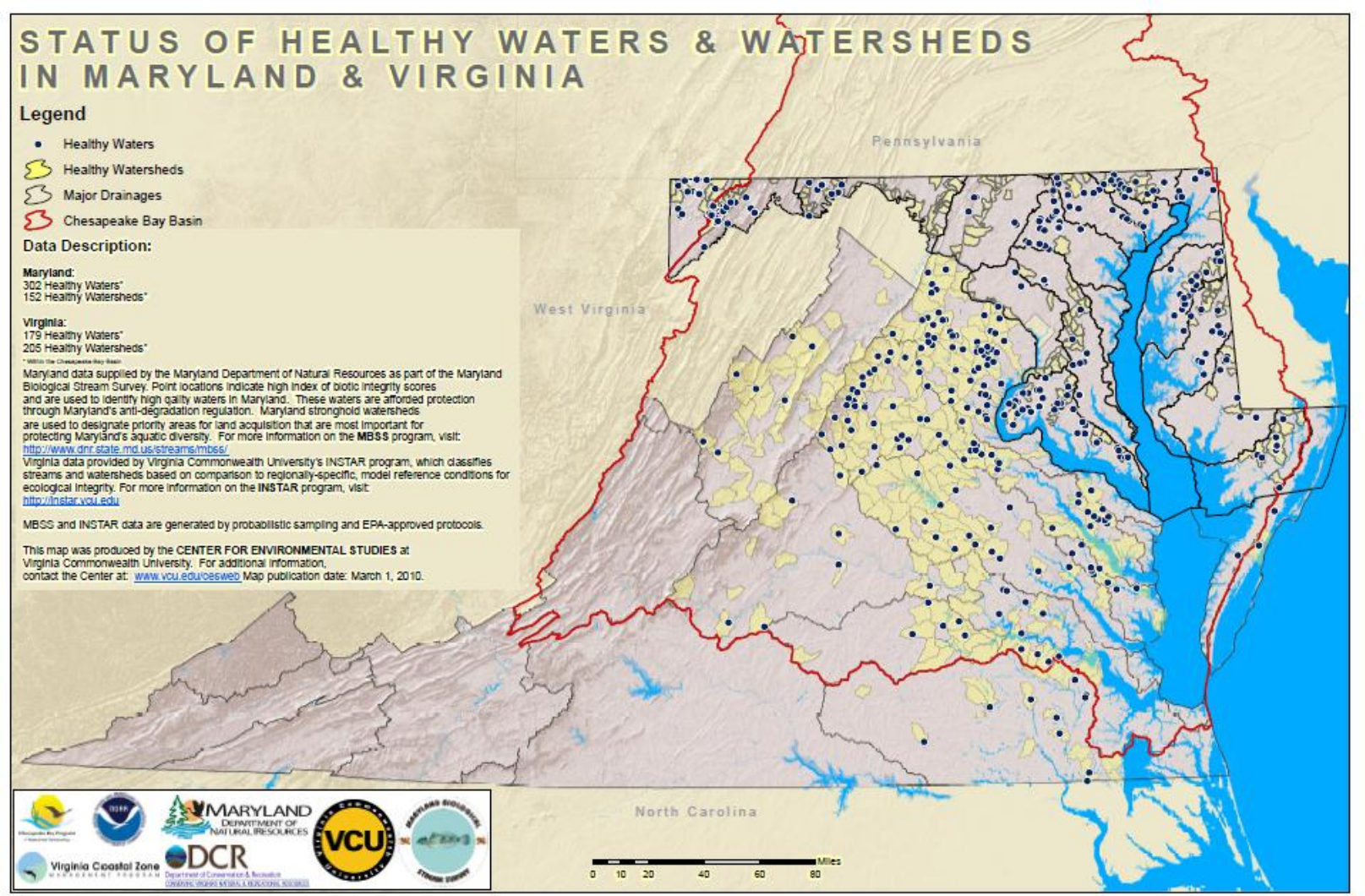
- Improve science and policy
  - Pilot a fish community indicator of watershed health
  - Convene workshops to explore linkage between healthy watershed protection and the Bay TMDL

Improving science



OFFICE OF INSPECTOR GENERAL

Catalyst for Improving the Environment

Evaluation Report

Development Growth Outpacing Progress in Watershed Efforts to Restore the Chesapeake Bay

Report No. 2007-P-00031

September 10, 2007

"New development is increasing nutrient and sediment loads at rates faster than restoration efforts are reducing them…a **16% increase over the past two decades**"

"Developed lands contribute less than *one-third of the Bay loads* but would require about *two-thirds of the* overall estimated restoration *costs*"

Crediting conservation

- Sponsoring a series of workshops to explore how to "count" protective actions that avoid conversion of forests and other critical resource lands
  - Science – STAC
  - Policy – Chesapeake Bay Commission

- Potential applications include:
  - Credit in-stream processing by healthy streams
  - Credit permanent BMPs by applying high efficiencies
  - Increase assurance that load caps will be maintained

Beneficial Effects of Healthy Watersheds on Pollutant Fate and Transport

This workshop will examine and discuss how important attributes such as natural variation within a feature class, anthropogenic degradation, management status, and spatial factors (e.g., hydrologic connectivity, location in watershed) affect how nutrient and/or sediment retention/loading rates are assigned to natural landscape features (wetlands, riparian buffers, and streams, including hyporheic zones) within the Chesapeake Bay Watershed Model.

Location and Lodging

When:

March 7, 2012 -March 8, 2012

Where:

Bishop Claggett Retreat Center
3035 Buckeystown Pike
Buckeystown, MD
website

Additional Information:

Registration

Registration is currently closed. If you have any questions, please contact STAC Staff

Questions?

Greg Garman, Workshop Lead
Matt Johnston, STAC Representative
Natalie Gardner, STAC Staff

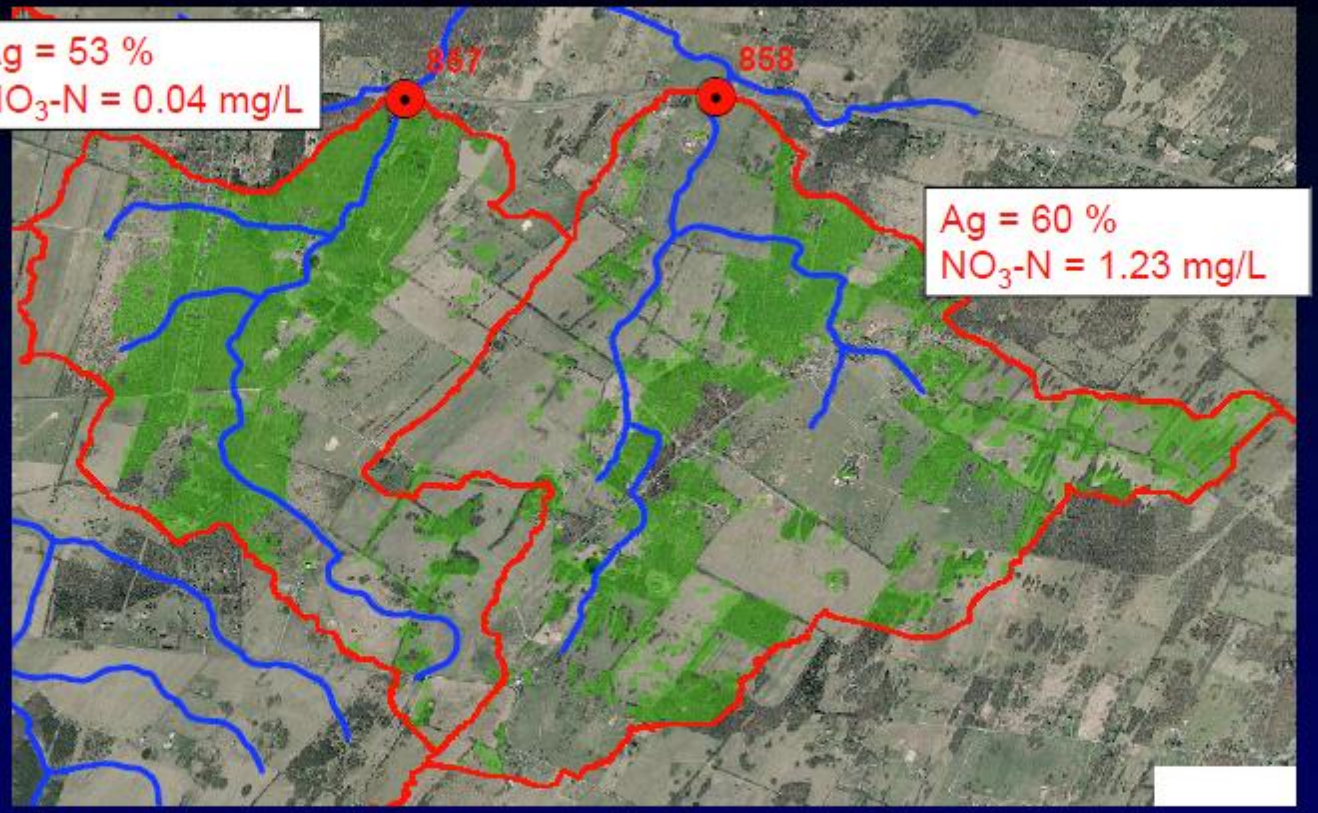
Sponsorship

Healthy Watersheds GIT

Every tree in the watershed counts and needs to be factored into the model

Bern Sweeney,
Stroud Center

Land-Use Effects



- Similar fractional land-use, but distinct N conc.
- Lumped categorization might not capture relevant N removal processes.

(Luc Claessens, Univ of DE)

What the scientists said:

- There's a lot of **uncertainty** and **future research needs**
- But, we all agree that **some really things matter** when quantifying benefits of healthy watersheds:
  - Forest amount and spatial arrangement
  - Stream width
  - Flow paths (surface and subsurface)
  - Retention time and connectivity (e.g., floodplains!)
  - Location, location, location!
- And we **can quantify benefits** of features to better represent the values of natural features
  - → Pursue upgrades to our pollution accounting framework that more accurately reflect these benefits and create incentives to keep them intact!

Chesapeake Bay Commission policy project

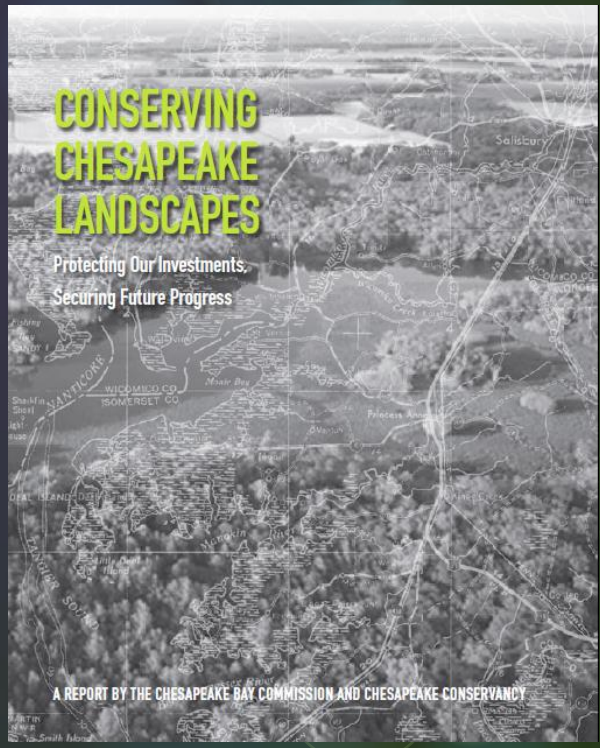
- Focused on identifying and recommending policy options that credit protective actions through our existing water quality policy framework
- Project slated to be completed by the end of 2012
- Steps:
  - Develop scientific basis (GIT 4/STAC)
  - Legal analysis of existing federal/state policy framework
  - Workgroup development of policy options
  - Recommendations to EPA/States

So, what do we know?

- Land conversion increases nutrient and sediment loads
- The number of impaired streams in the mid-Atlantic region has increased dramatically
- More than 3 million people are projected to move into the watershed in the next three decades
- Energy development in the upper watershed has increased significantly
- Natural areas provide pollution reduction benefits through in-stream processing, denitrification, as well as supporting local, "up-watershed" communities and economies
- Investing today in pollution prevention through land protection and other proactive means is more cost-effective and successful than allowing streams to be degraded and then attempting to restore them
- The accounting framework for the current TMDL is based on reductions from a 2010 baseline and does not account for or directly promote actions that avoid future loads
- Prevention of land conversion will be essential to meet pollution reduction and maintenance goals for the Bay

What we need to do…

- Track where healthy watersheds are **and** how good we are at protecting them
- Update watershed models to better reflect the values that healthy watersheds provide
  - → 2017 update
- Develop new policy approaches that create additional incentives for protection of healthy watersheds
- Advocate for protection as an essential complement to restoration in meeting our water quality and habitat goals

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