Conserving Virginia's Healthy Waters

Albemarle-Pamlico National Estuary Program
State of the Sounds Symposium
November 17, 2011
New Bern Convention Center
New Bern, NC

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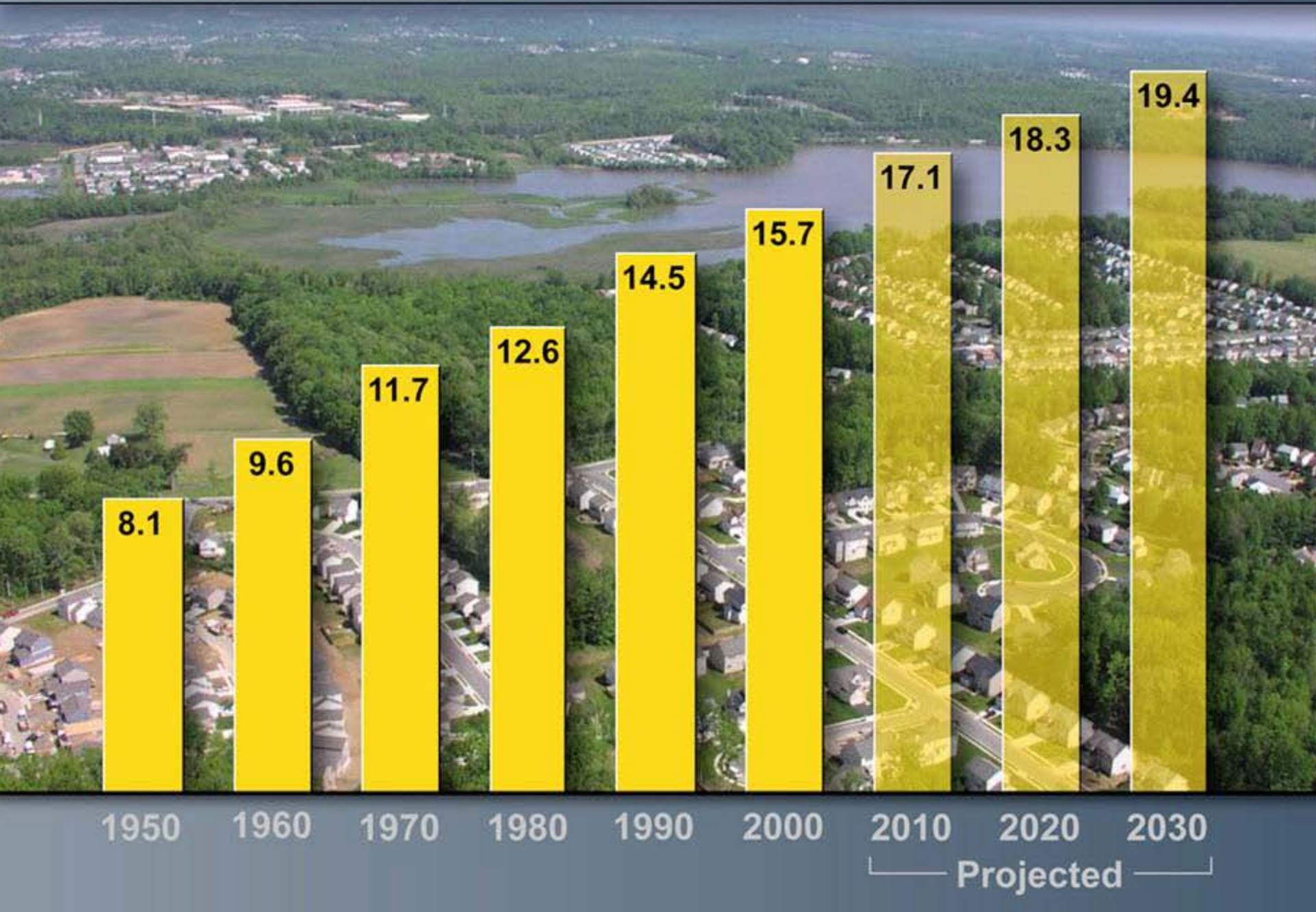
Virginia Commonwealth University

Bay Watershed Population Growth: 1950 - 2030

1950 1960 1970 1980 1990 2000 2010 2020 2030

Bay Watershed Population Growth: 1950 - 2030



Population Growth and Development: 1990 - 2000

Population

Population Growth and Development: 1990 - 2000

Population Growth and Development: 1990 - 2000

8.2%

25%

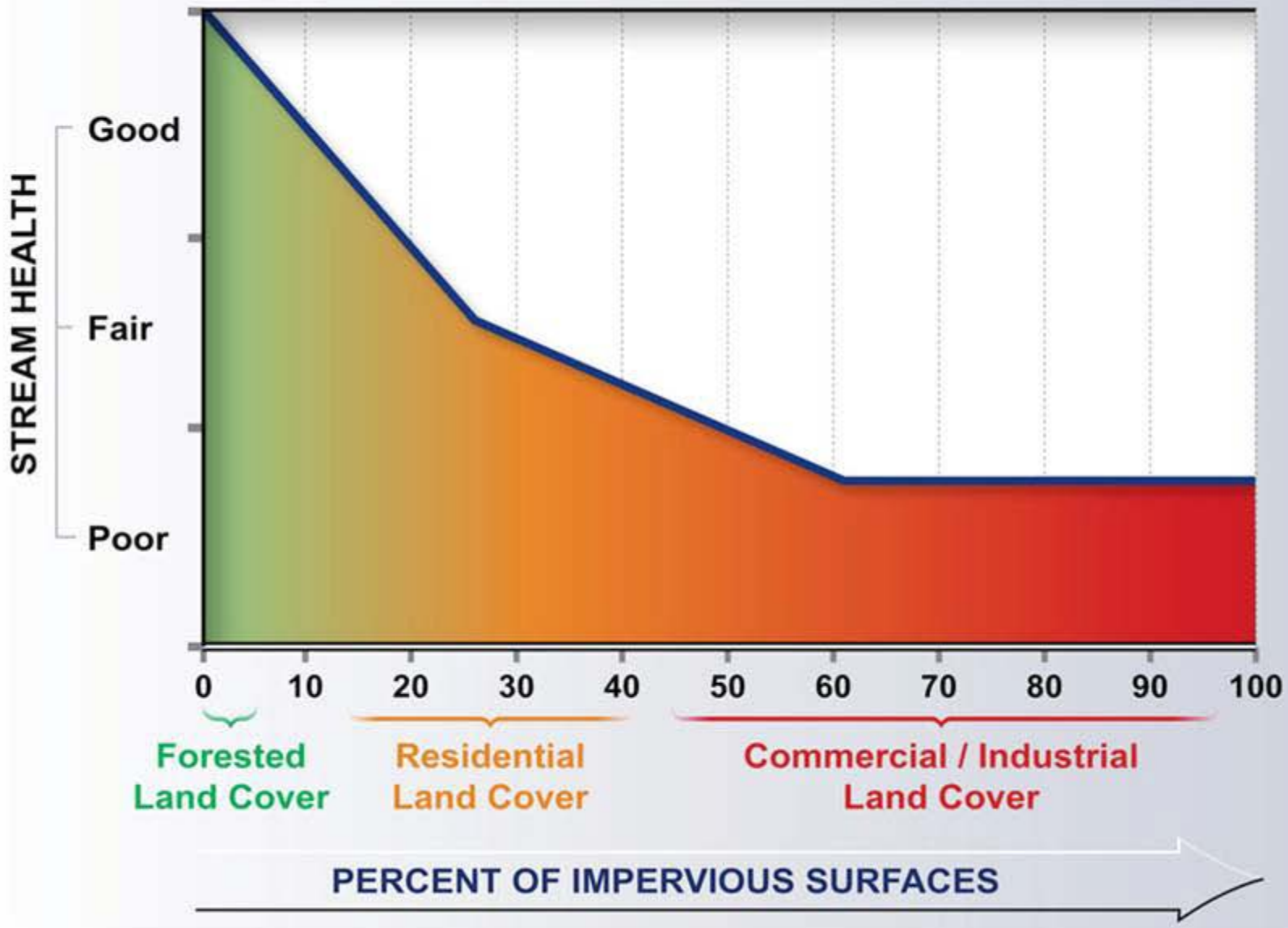
41%

Population

Land Conversion

Impervious Surfaces

Impervious Surface & Stream Health



What Is VA's Healthy Waters Initiative?

- **Inter-agency partnership led by VDCR, VCU, and VDEQ**
- **To identify and maintain watersheds**
  - **with high ecological integrity**
  - **that provide ecosystem services and social and economic benefits**
- **Success based upon partnerships with local champions: APNEP, TNC, Conservation Districts, etc.**

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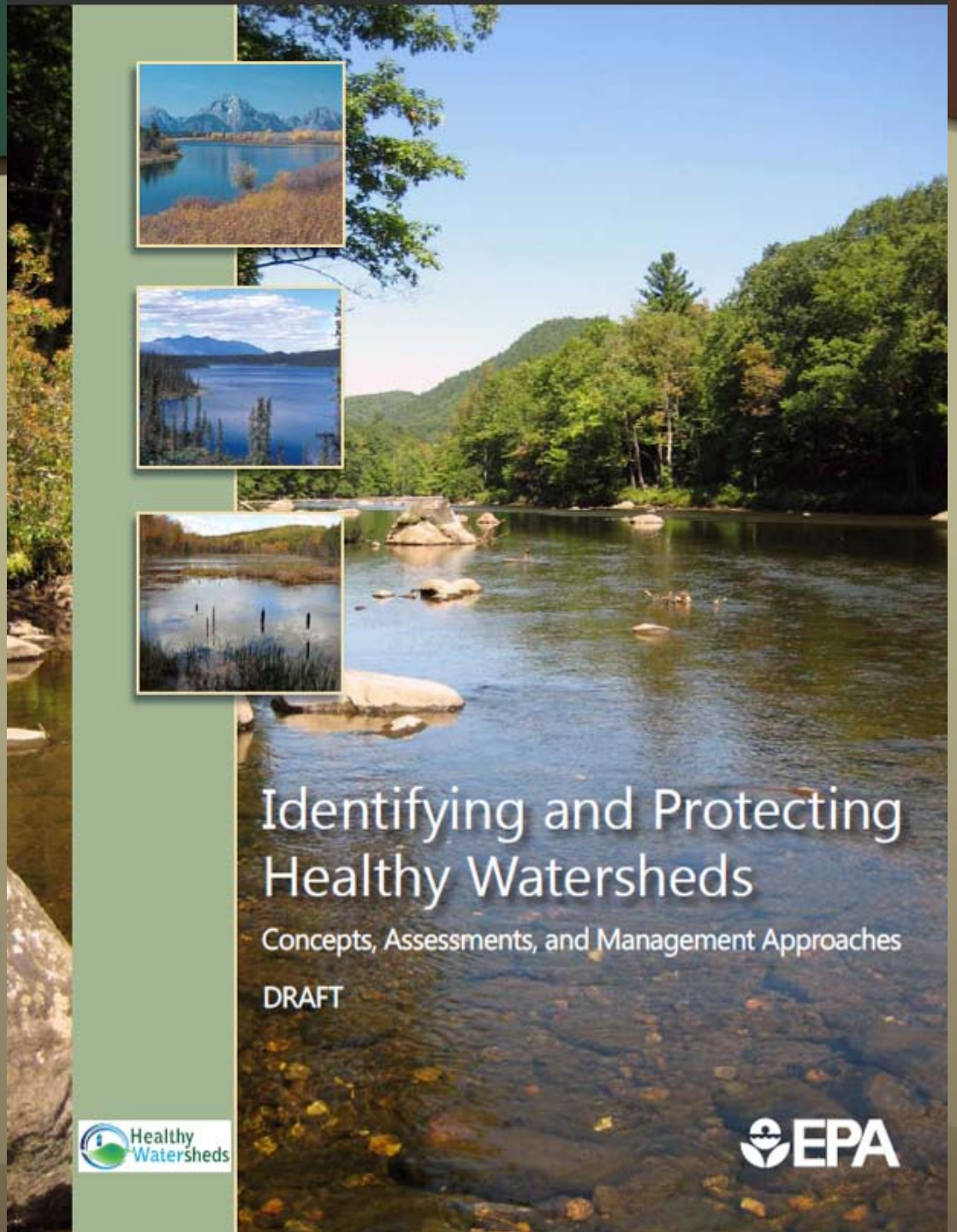
- **Virginia's Healthy Waters Initiative is one of the leading efforts in the nation**

- **Referenced in the new USEPA Healthy Watersheds manual**



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Why Healthy Waters?

- High population growth, rapid rate of land conversion and even higher growth of impervious cover
- Thousands of known WQ impairments
- Restoration is a daunting and expensive challenge
- Declining ecological health
- Healthy Waters = Healthy Bay
- We need to identify and conserve what we have left!

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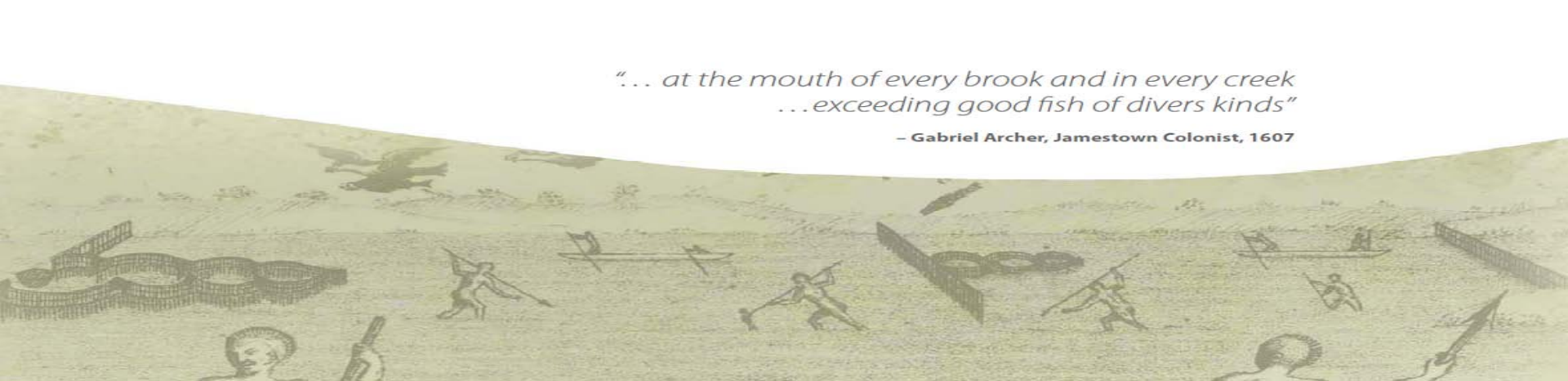
Benefits Of Conservation

- **Its positive**
- **Its proactive**
- **Its effective and cost effective**
- **It is the only way to ensure the long term ecological health of stream, rivers, estuaries**



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For every 10% increase in forest cover, up to 60%, water quality treatment costs decrease by 20% (TPL, AWWA, 2002)

Water Treatment and Chemical Costs Based on Percent of Forested Watershed			
Percent of Watershed Forested	Treatment and Chemical Costs per Million Gals	Percent Change in Costs	Average Treatment Costs per day at 22M gals
10%	$115	19%	$2,530
20%	$93	20%	$2,046
30%	$73	21%	$1,606
40%	$58	21%	$1,276
50%	$46	21%	$1,012
60%	$37	19%	$814

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Healthy Waters Development

- Initially relied on Natural Heritage data and fish IBI information (not water quality)
- Advanced to a probabilistic field based multiple metric sampling approach (fish, macroinvertebrates, and habitat) - primarily funded by EPA and NOAA
- Objective, statistically based classification methodology
- Bay-wide coverage with good data density
- Includes thousands of stream and river sampling sites
- Recently added watershed delineations
- Expanding coverage beyond the Bay watershed, into Chowan and SW VA

Interactive Stream Assessment Resource (InSTAR)

- Multi-metric ecological assessment - physical condition of streams, habitat, fish and macro invertebrate assemblages
- It uses high quality archival and field collected data through a probabilistic sampling approach
- Thousands of rivers and streams have been assessed
- All data and the assessment methodology is available on an interactive, searchable website housed by VCU: http://instar.vcu.edu/
- To date, approximately 250 waters have been identified as having high ecological integrity (healthy)

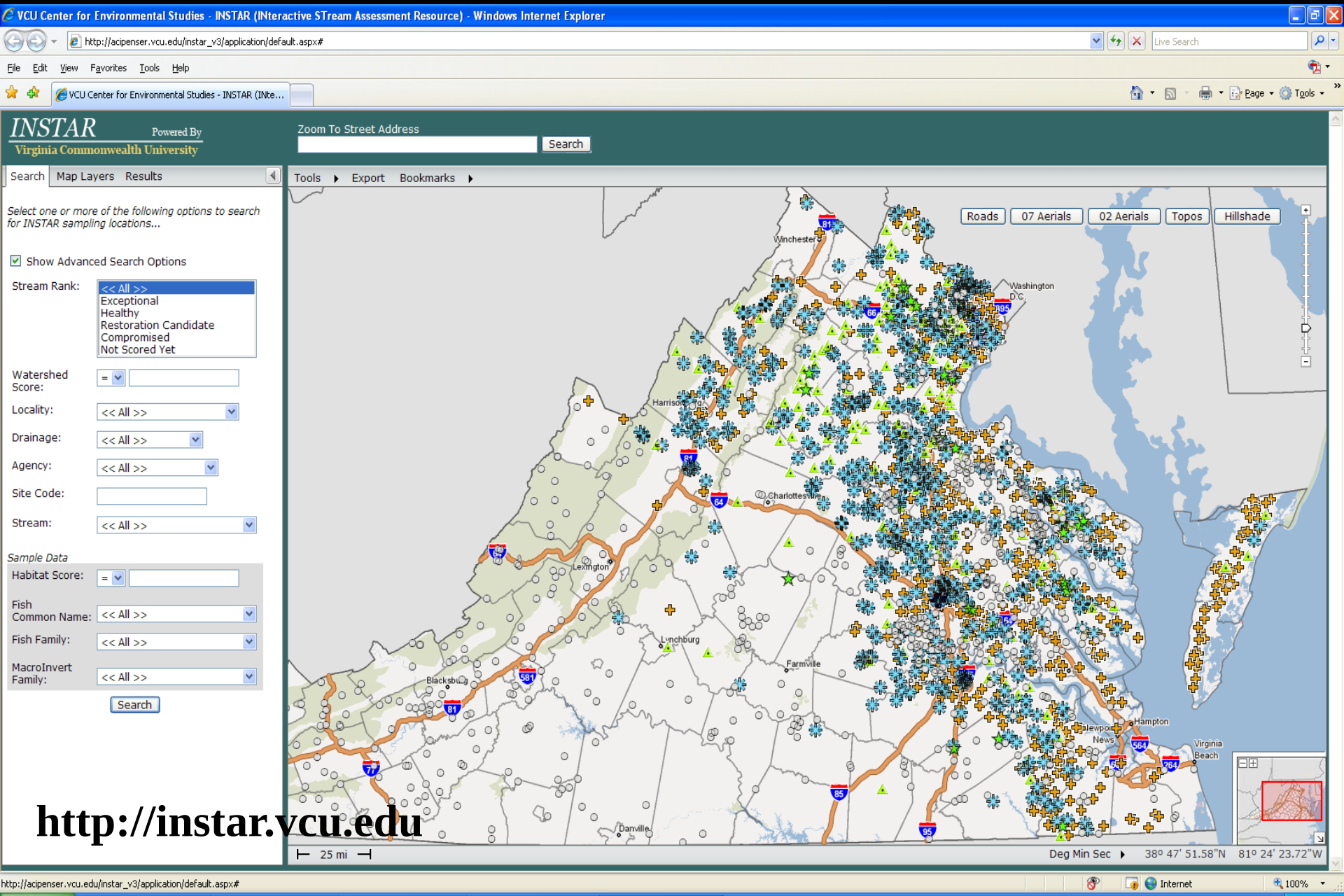
Comparison of Approaches to Stream Assessment

RBP/IBI/VSCI

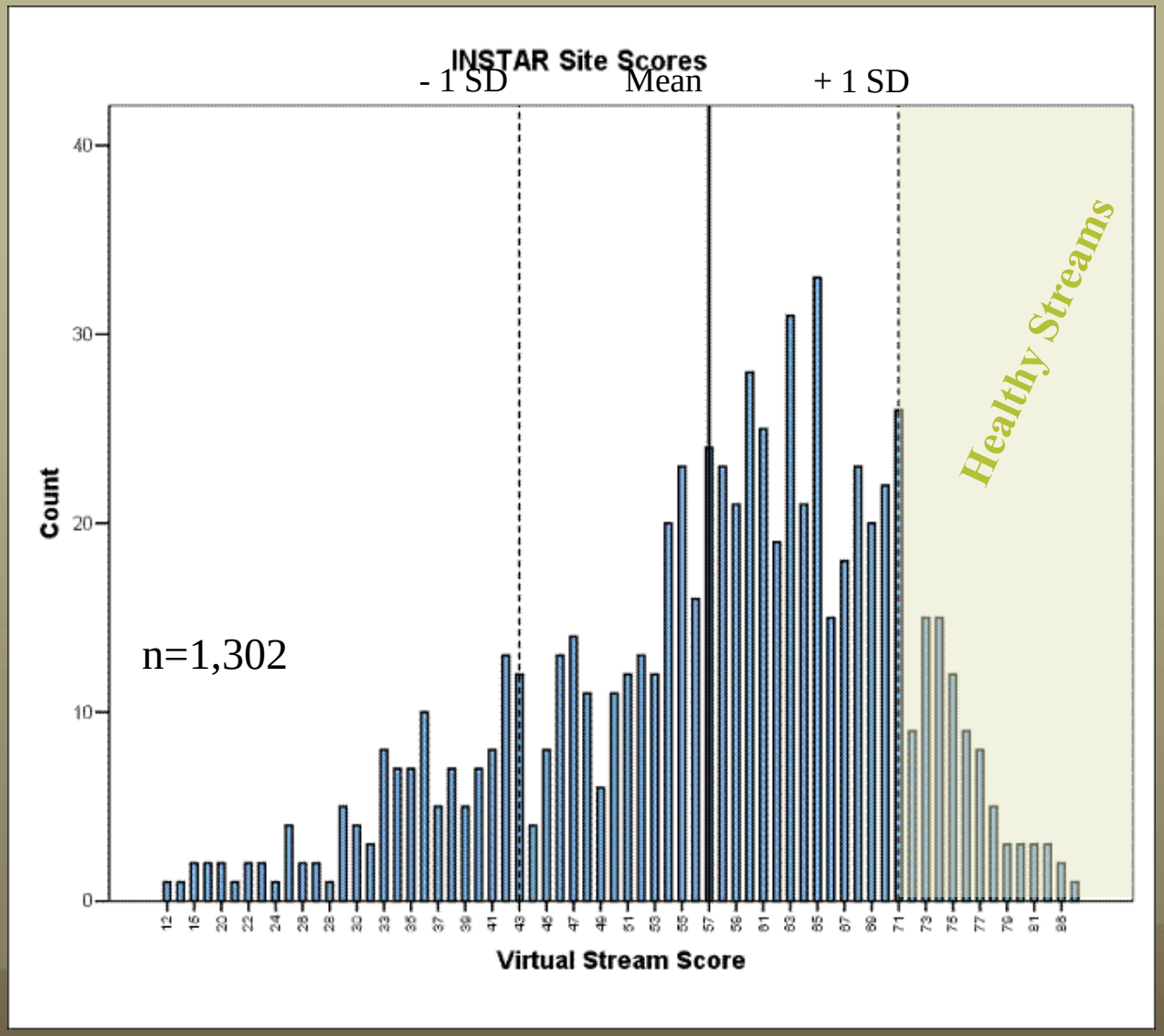
- 8 to 12 metrics
- fish *or* bugs *or* habitat
- physical reference sites
- reliance on BPJ
- one size fits all…
- targeted or probmon
- trend analysis

INSTAR

- >50 potential metrics
  - integrative
- model reference conditions
- reliance on statistics and BPJ
- eco-region/ basin models
  - probmon
- no trend analysis


VCU Center for Environmental Studies - INSTAR (INteractive STream Assessment Resource) - Windows Internet Explorer
http://acipenser.vcu.edu/instar_v3/application/default.aspx#
INSTAR
Powered By
Virginia Commonwealth University
Zoom To Street Address
Search
Search
Map Layers
Results
Tools
Export
Bookmarks
Roads
07 Aerials
02 Aerials
Topos
Hillshade
Select one or more of the following options to search for INSTAR sampling locations...
Show Advanced Search Options
Stream Rank:
<< All >>
Exceptional
Healthy
Restoration Candidate
Compromised
Not Scored Yet
Watershed Score:
Locality:
Drainage:
Agency:
Site Code:
Stream:
Sample Data
Habitat Score:
Fish Common Name:
Fish Family:
MacroInvert Family:
Search
Winchester
Washington D.C.
Charlottesville
Lexington
Lynchburg
Farmville
Blacksburg
Danville
Hampton
Virginia Beach
25 mi
Deg Min Sec
38° 47' 51.58"N
81° 24' 23.72"W
http://instar.vcu.edu

Stream Ecological Integrity Classes



'Healthy' defined as >71% comparable to appropriate regional reference condition

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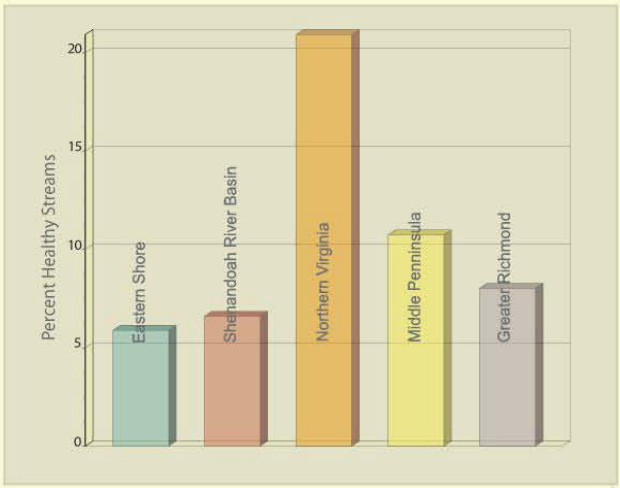
STATUS OF HEALTHY WATERS IN VIRGINIA



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Local Implementation

- Chesapeake Bay WIP 2
- Low Impact Development
- Comprehensive Planning
- Zoning
- Siting UDAs
- TDR and PDRs
- Conservation Partnerships
- Targeting Restoration

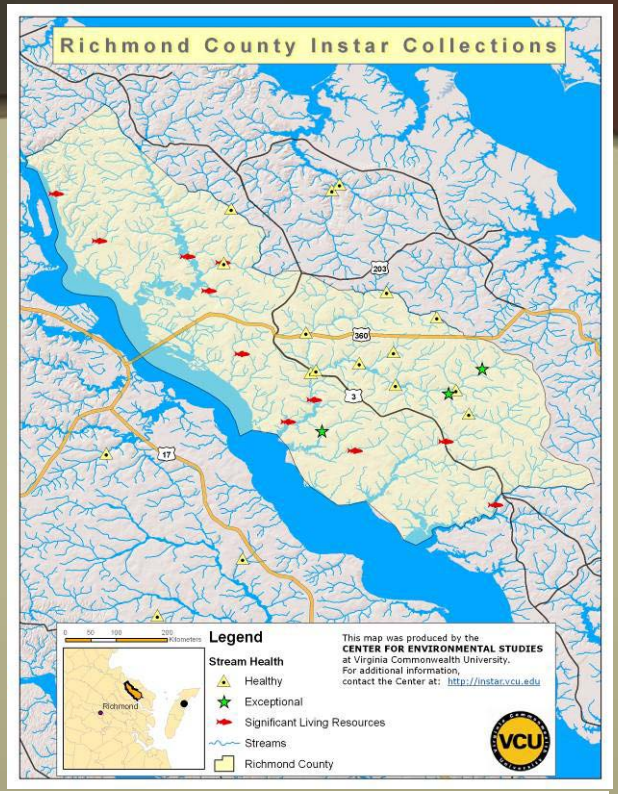
How can INSTAR and Healthy Waters data be used?

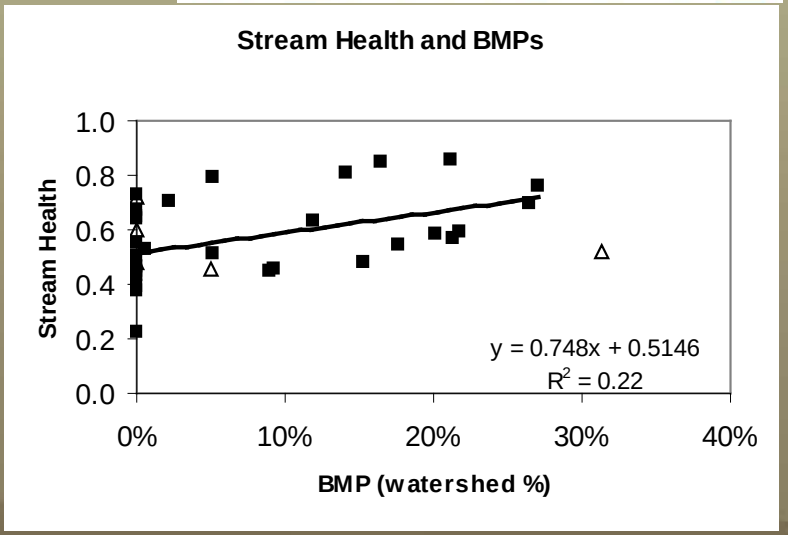
1.) Prioritize streams and watersheds for protection and restoration

2.) Identify significant living resources

3.) Inform zoning, landuse, and comprehensive planning decisions

And…





Data from Richmond County, VA NFWF Study

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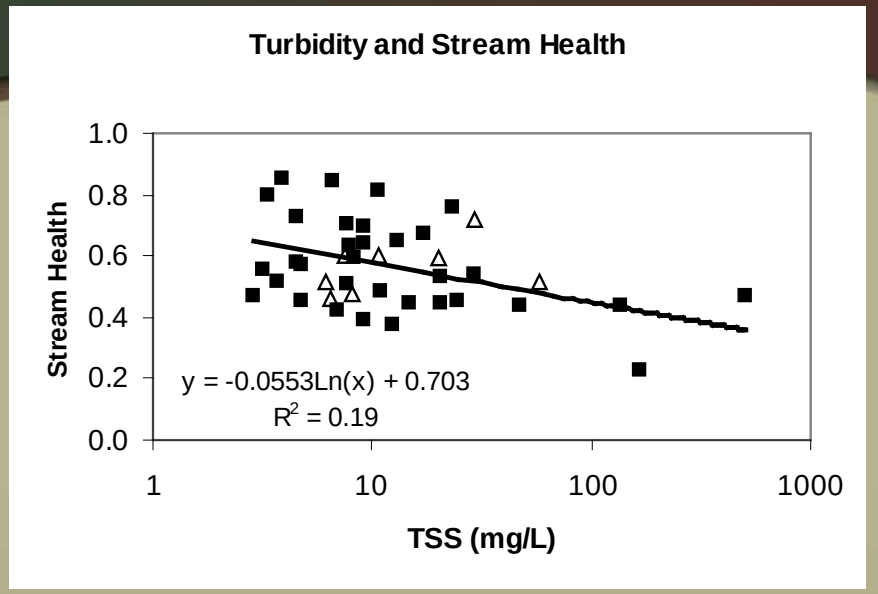
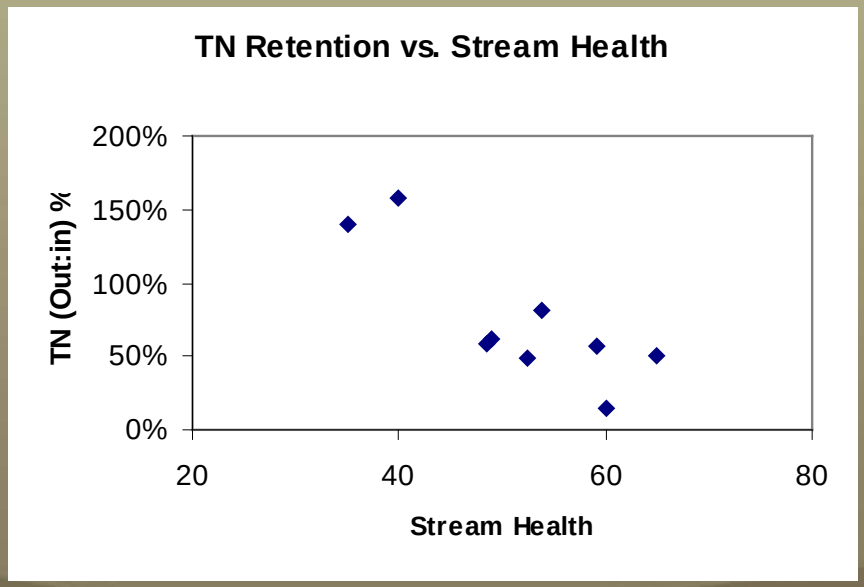
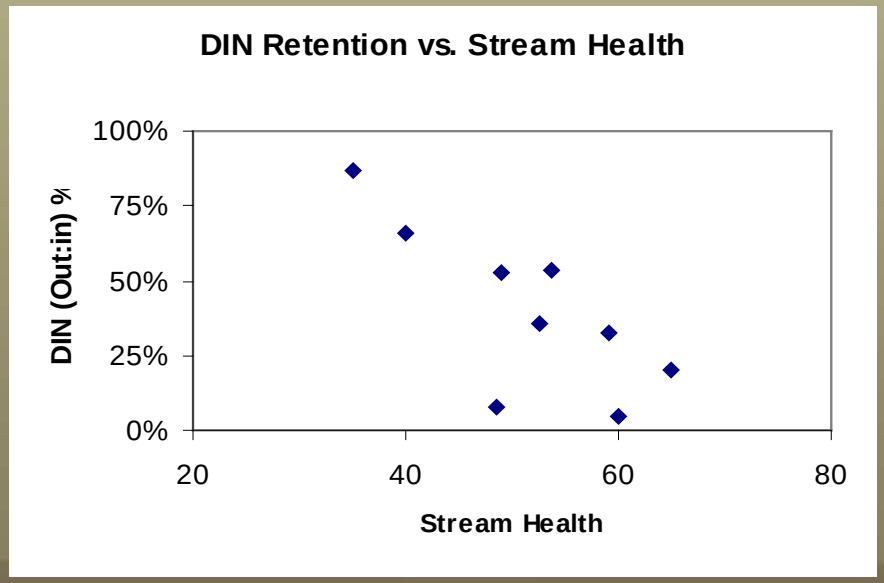
4.) Develop and implement local nutrient and sediment reduction strategies based on identification and protection of Healthy Waters and restoration of the '*mostly* healthy'







All data from Richmond County, Virginia NFWF Project

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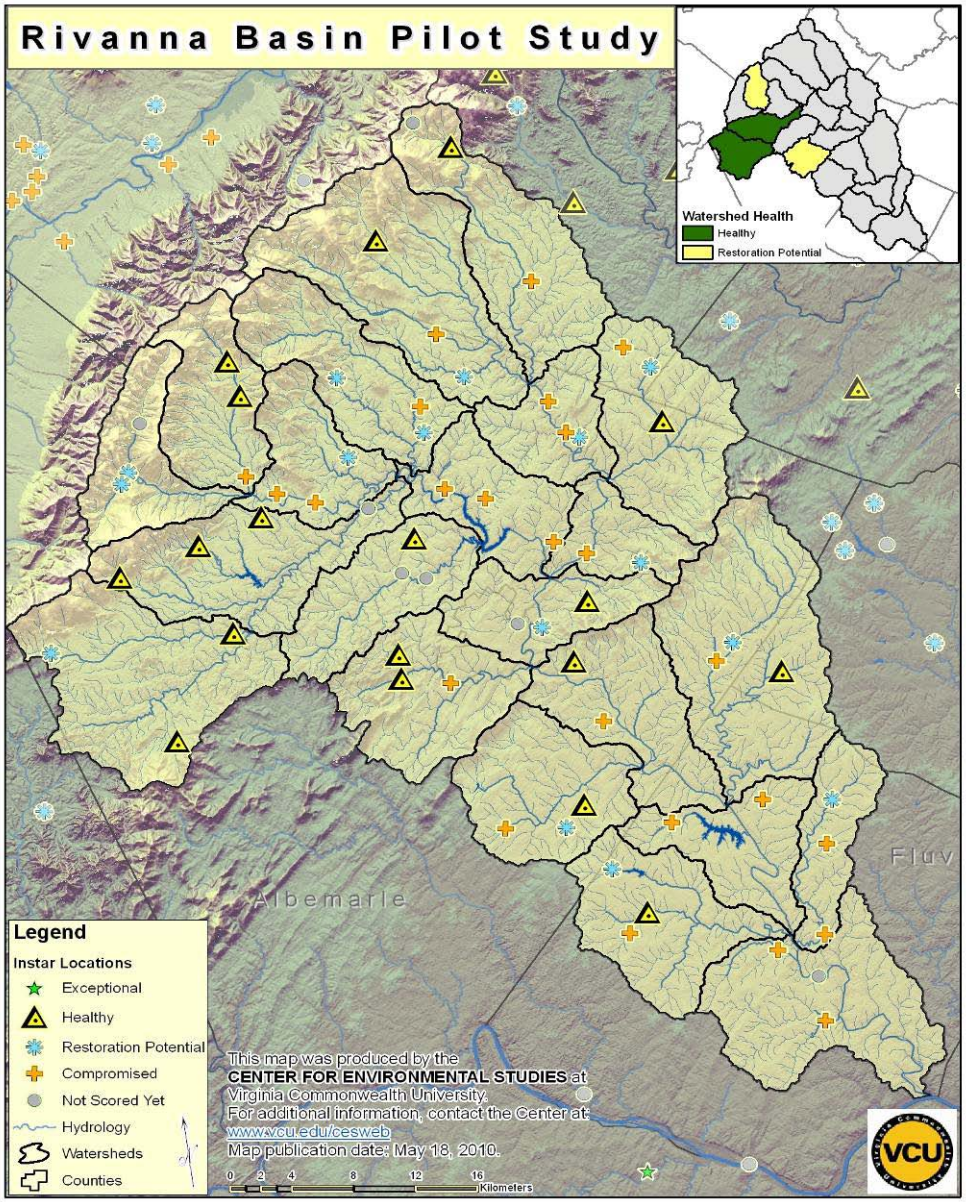
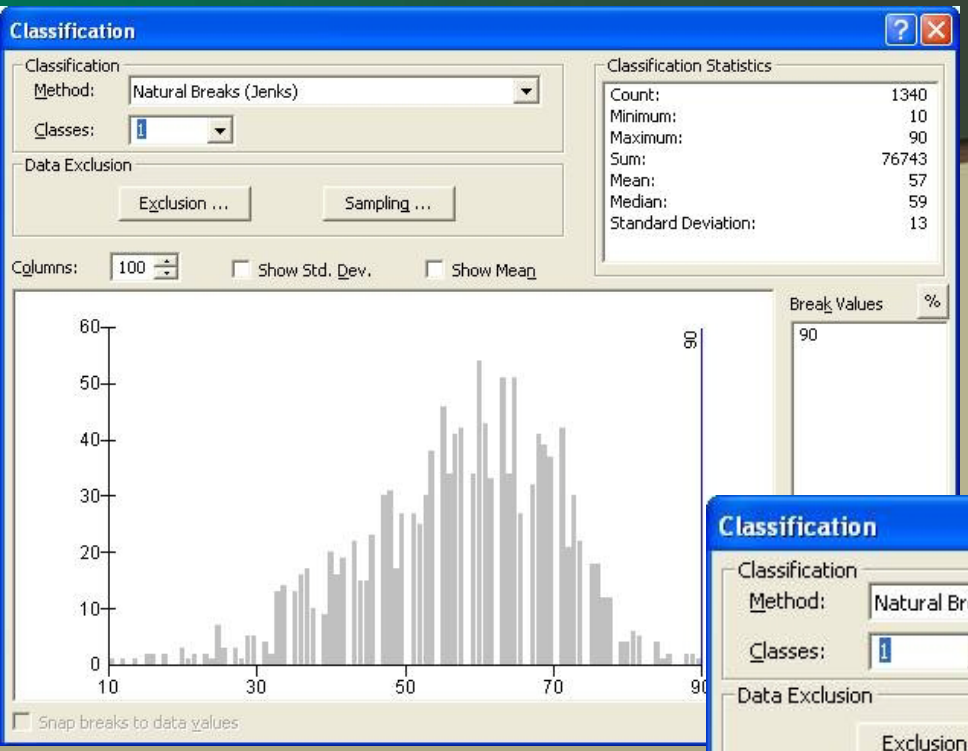
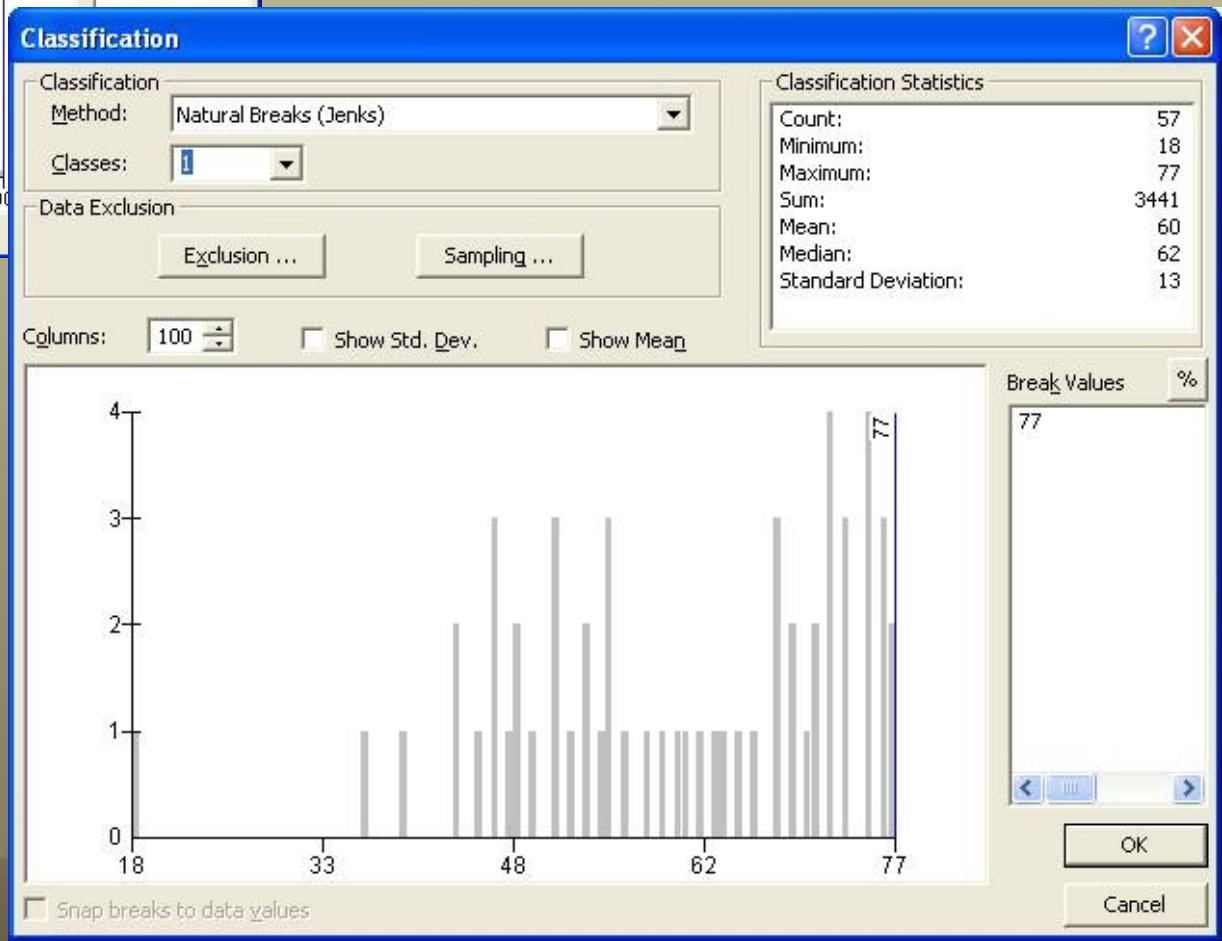
Rivanna Basin
Charlottesville, VA





Chesapeake Bay streams



Rivanna Basin streams

Healthy Waters Conservation Actions

- Connecting healthy waters to the Phase II Bay Watershed Implementation Plan or other conservation plans
- Targeting healthy watersheds for Agricultural BMP Cost-Share Program funding
- Updating conservation mapping and disseminating healthy watershed information to coastal localities
- Incorporating healthy waters data into Natural Heritage biological data bases-VEVA
- Implement land protection strategies—acquisition, easements, livestock exclusion, etc

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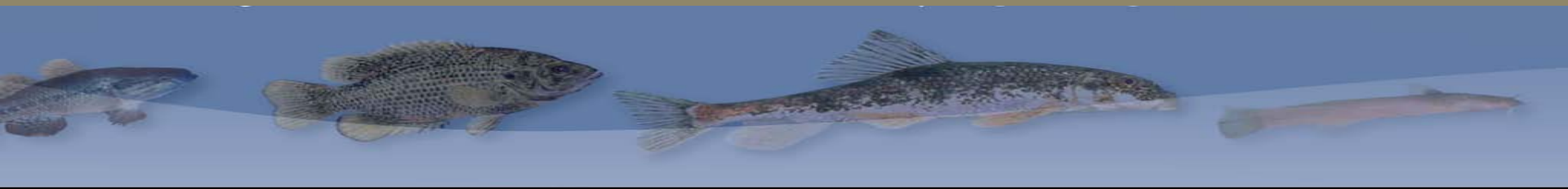
Challenges

- **Failure to recognize the extent of the conservation challenge is a major impediment**
- **Despite continuing water quality degradation, and accelerated ecological degradation, conservation lags behind restoration**
- **While the Clean Water Act clearly mandates anti-degradation, funding and measureable improvements remain focused on cleanup of impaired waters**



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More challenges

- Water Quality Assessments are not focused on identifying Healthy Waters
- BMP implementation is not targeted at Healthy Waters
- Bay TMDL planning is not focused on conservation or on local stream health
- Conservation is not a federal, state, or local mandate
- Very little awareness by decision makers, NGOs or the public about the insidious decline of ecological integrity

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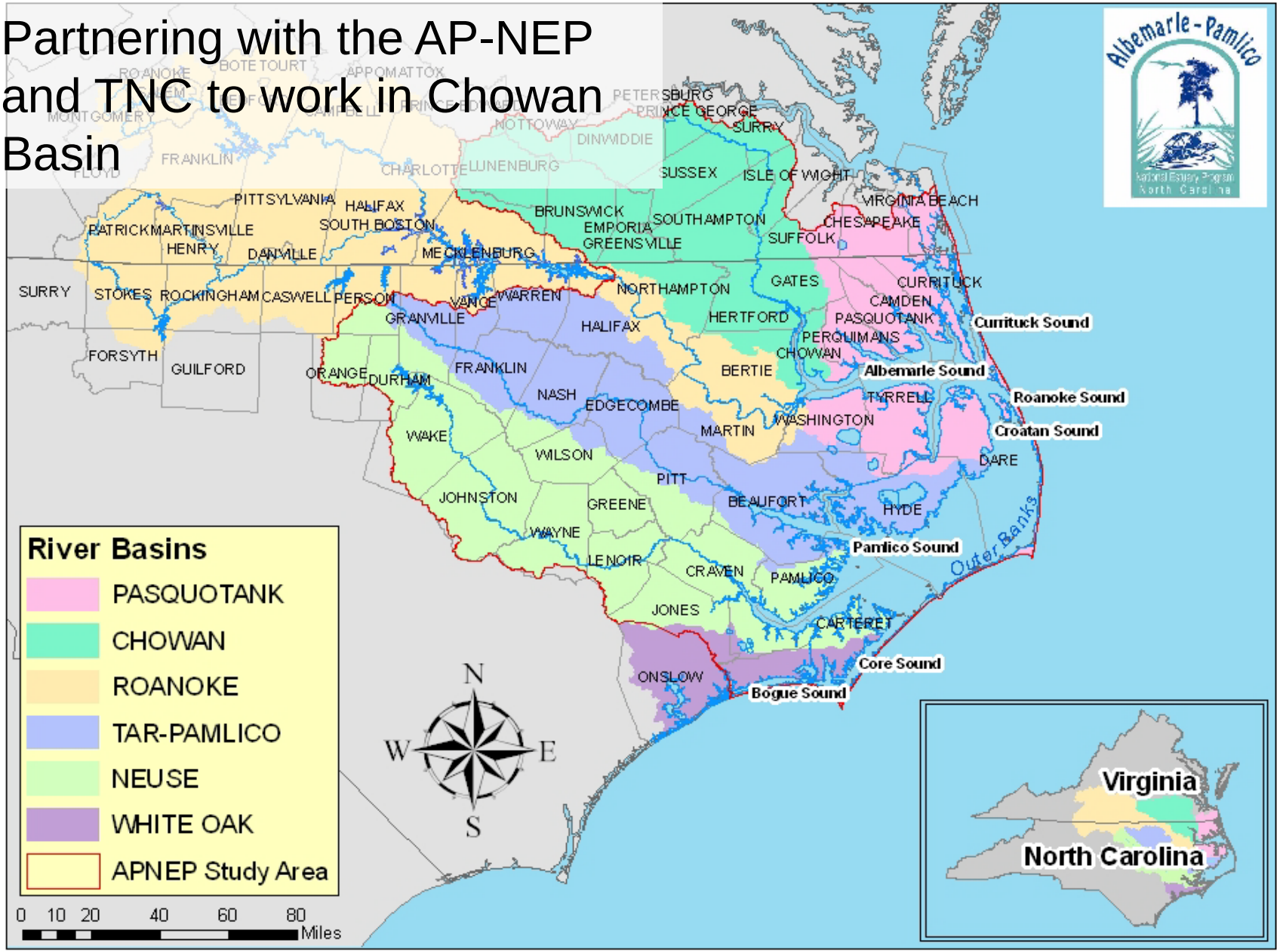
What is being done?

- Expanding and maintaining INSTAR
- Leveraging and coordinating natural resources management programs
- Integrating HWI language into State Code
- Providing technical assistance to local governments
- Modifying WQ criteria in black water systems
- HW data is being onsidered as criteria for min flow determination
- Scenic Rivers Board is using HWI as criteria for designation
- **Developing new partnerships!**

Partnering with the AP-NEP and TNC to work in Chowan Basin



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Chowan Basin Pilot Project

- **Advance Virginia interstate watershed and basin activities**
- **Further expand the partnership with NC on shared watershed activities**
- **Partner with APNEP to develop a Chowan Basin protection plan:**
  - **Advancing the APNEP CCMP**
  - **Identifies and recommends protection of ecologically sensitive resources**
  - **Provides recommendations for modifying the USEPA Implementation Plan for *protection* as opposed to *restoration***

Chowan Basin Pilot Project

- Workplan Schedule: Two year duration

- Winter 2011/2—Conduct Coarse Scale remote assessment of Chowan
- Winter 2011/2—Develop Stakeholder group to provide input to suggest three watersheds in the Chowan Basin (STAC?):
  - VA, NC and one shared
- Spring-Fall 2012—In-field data collection, in those above listed
- Spring-Summer 2012—Begin stakeholder engagement and outreach (CAC?)
  - Development of local workgroups to begin data evaluation and consider options

Chowan Basin Pilot Project

- **Workplan Schedule (Continued):**

- **Winter 2012/3—Data assessment**
- **Spring 2013—Final data collection and begin data integration**
- **Spring 2013—Community and stakeholder outreach/ engagement**
- **Spring-Fall 2013—Development of watershed protection plan for each watershed, including recommendations for modifying the USEPA Implementation Plan for the purpose of protection**
- **Winter 2013—Completion of Project**

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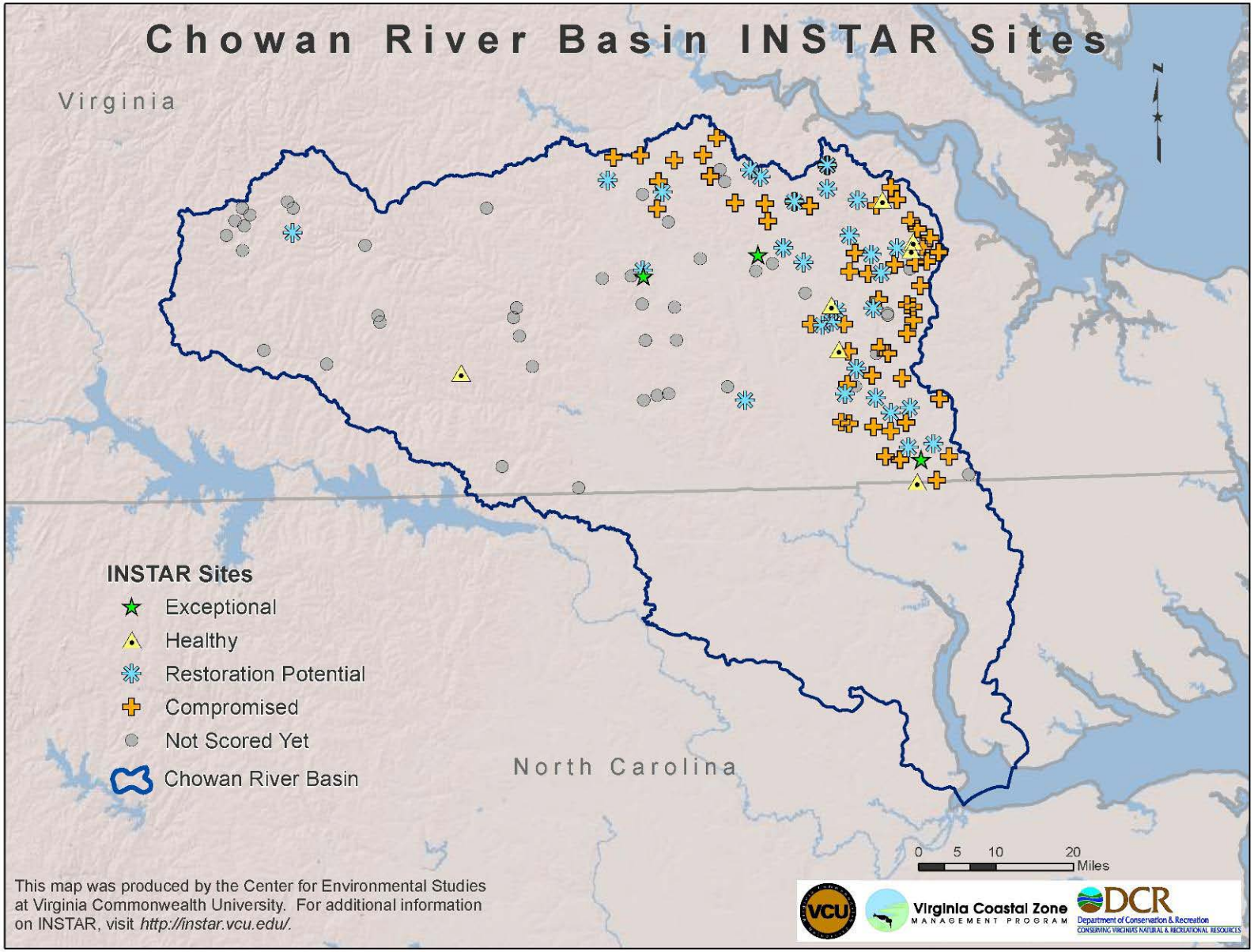

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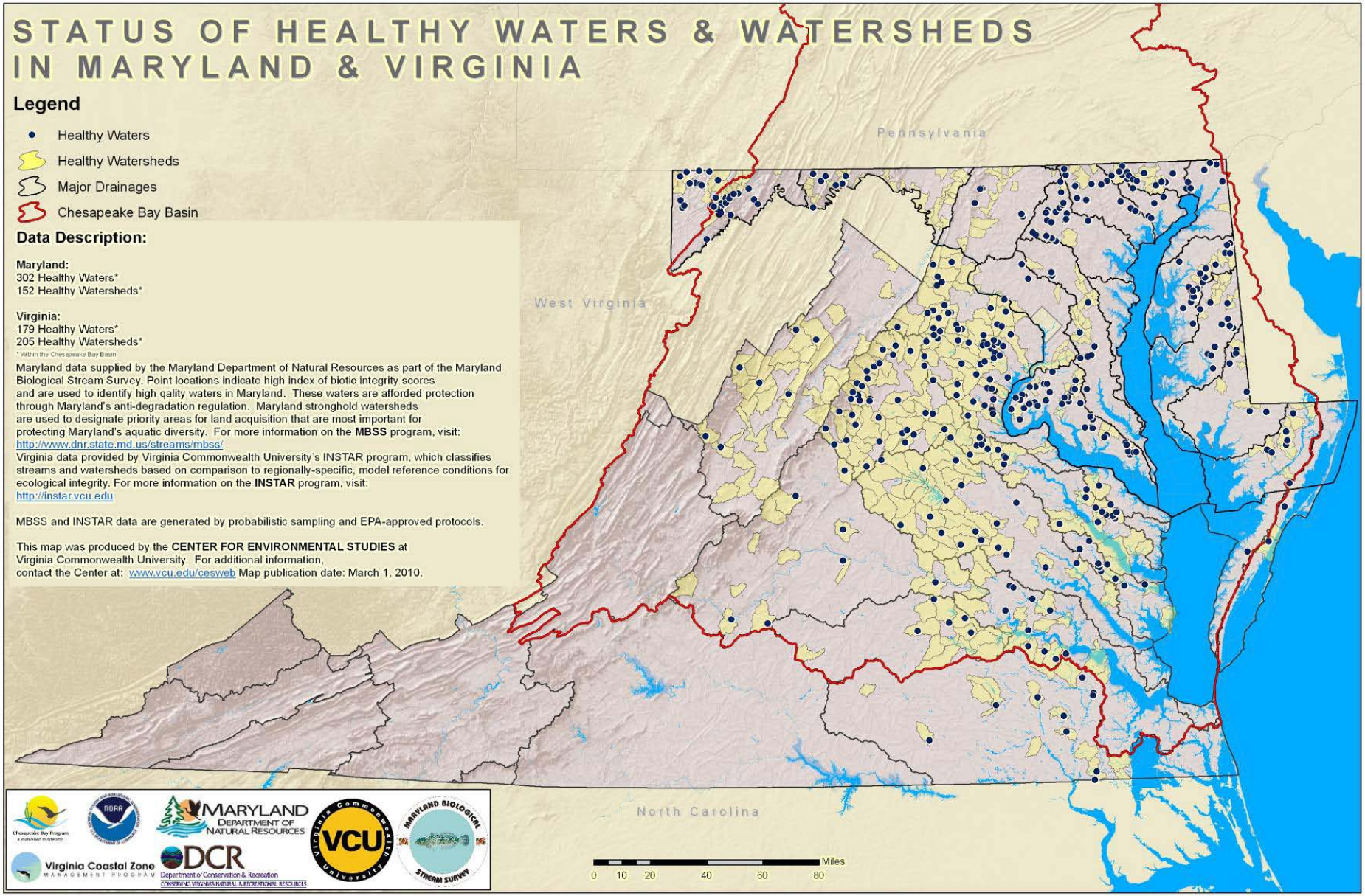
STATUS OF HEALTHY WATERS & WATERSHEDS IN MARYLAND & VIRGINIA



Data Description:

Maryland:
302 Healthy Waters*
152 Healthy Watersheds*

Virginia:
179 Healthy Waters*
205 Healthy Watersheds*

* Within the Chesapeake Bay Basin

Maryland data supplied by the Maryland Department of Natural Resources as part of the Maryland Biological Stream Survey. Point locations indicate high index of biotic integrity scores and are used to identify high qality waters in Maryland. These waters are afforded protection through Maryland's anti-degradation regulation. Maryland stronghold watersheds are used to designate priority areas for land acquisition that are most important for protecting Maryland's aquatic diversity. For more information on the **MBSS** program, visit: http://www.dnr.state.md.us/streams/mbss/

Virginia data provided by Virginia Commonwealth University's INSTAR program, which classifies streams and watersheds based on comparison to regionally-specific, model reference conditions for ecological integrity. For more information on the **INSTAR** program, visit: http://instar.vcu.edu

MBSS and INSTAR data are generated by probabilistic sampling and EPA-approved protocols.

This map was produced by the **CENTER FOR ENVIRONMENTAL STUDIES** at Virginia Commonwealth University. For additional information, contact the Center at: www.vcu.edu/cesweb Map publication date: March 1, 2010.

Chesapeake Bay Program
NOAA
MARYLAND DEPARTMENT OF NATURAL RESOURCES
VCU
MARYLAND BIOLOGICAL STREAM SURVEY
Virginia Coastal Zone MANAGEMENT PROGRAM
DCR Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Questions?

http://instar.vcu.edu

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