A Collaborative, Multi-Jurisdictional Stream-Monitoring Network to Support Restoration of Chesapeake Bay

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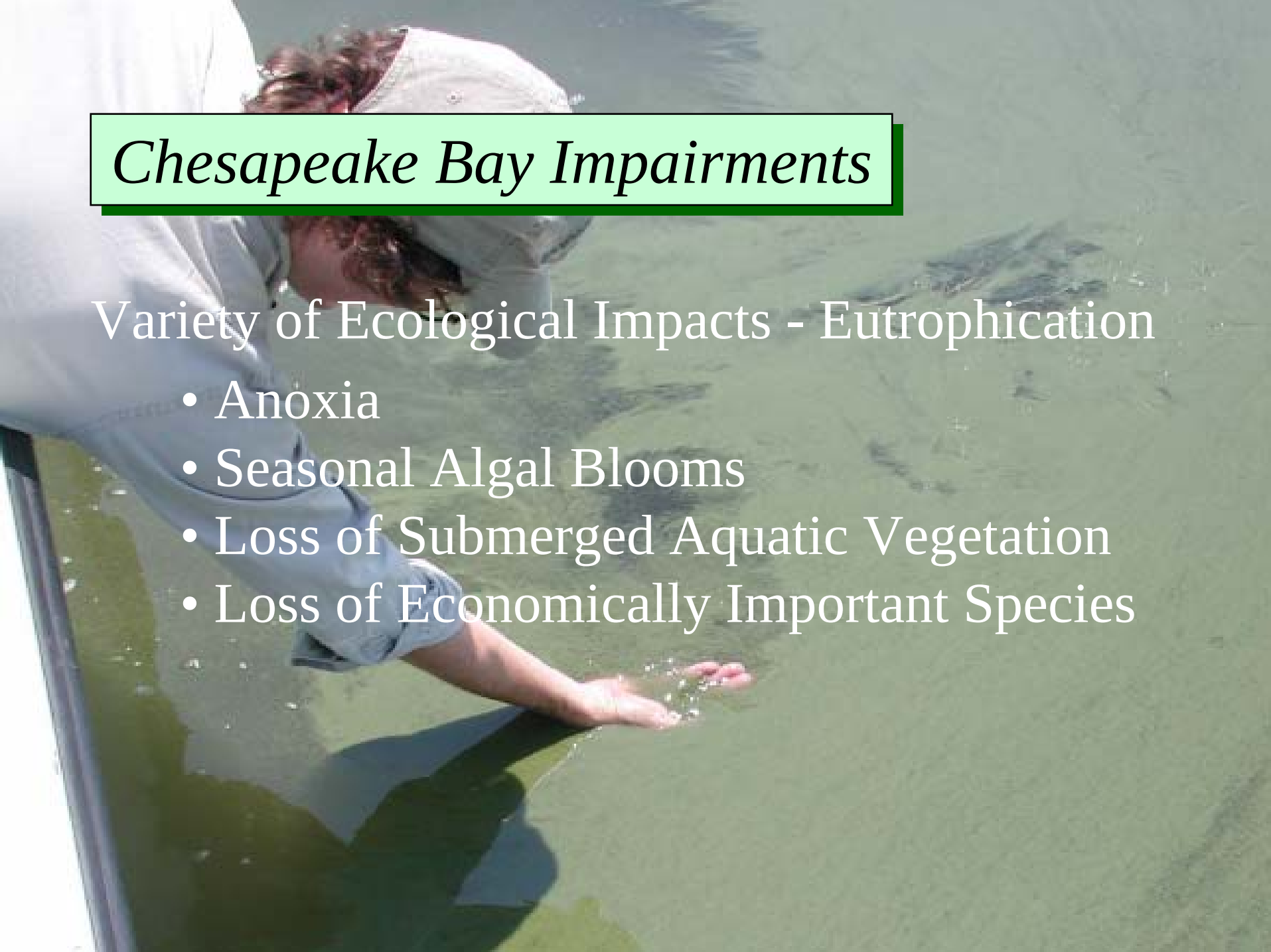
Chesapeake Bay Program
A Watershed Partnership



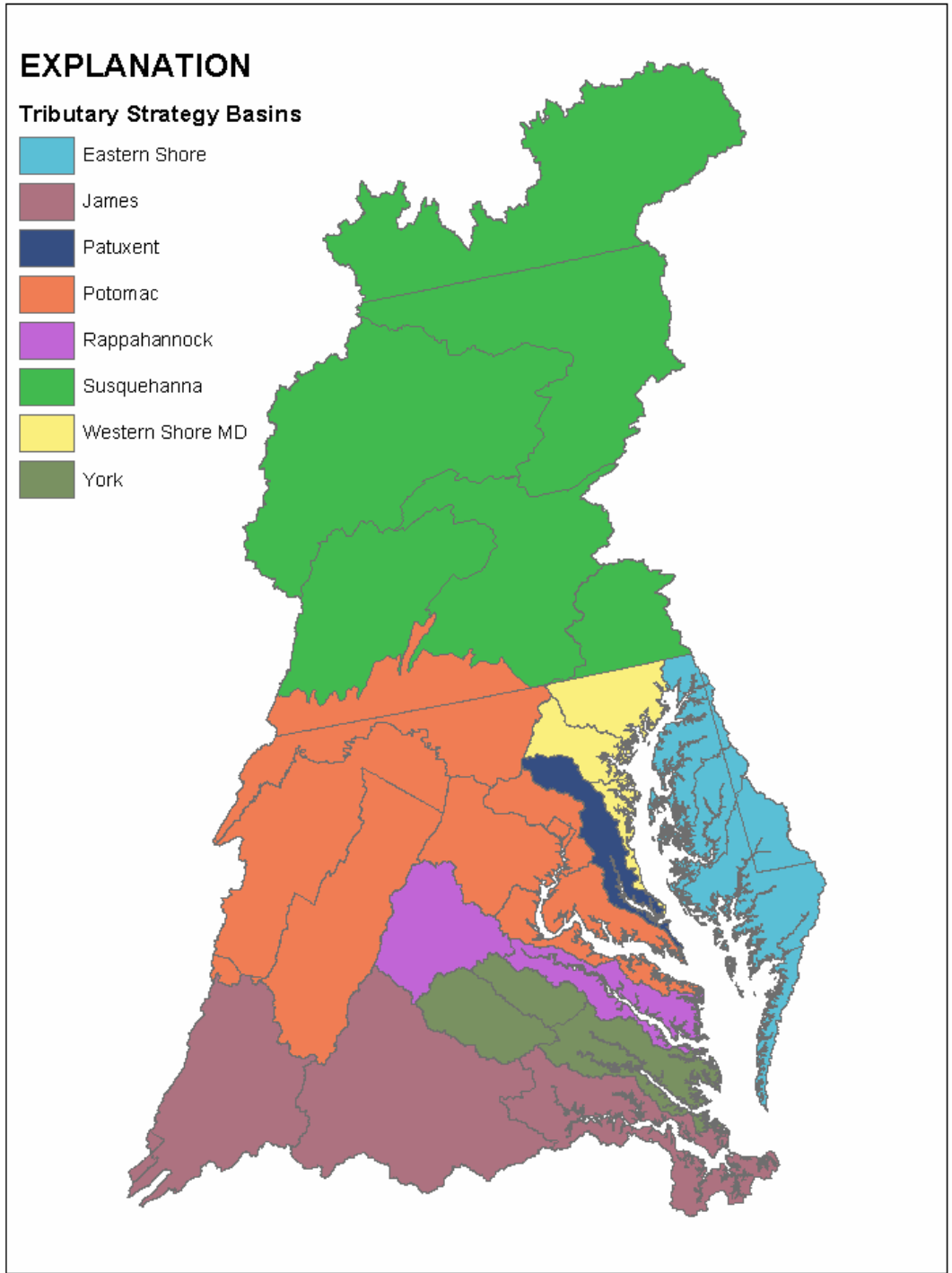
Chesapeake Bay Impairments

Variety of Ecological Impacts - Eutrophication

- Anoxia
- Seasonal Algal Blooms
- Loss of Submerged Aquatic Vegetation
- Loss of Economically Important Species

Tributary Strategy Basins

- Drainage units defined for implementation of management strategies that are designed to reach attainment of tidal water-quality criteria.
- Nontidal monitoring needed to track progress toward water-quality improvements.



Objectives of Non-Tidal Monitoring

A. What is the water-quality status?

e.g. - Flux from the watershed - load estimation

B. Is water-quality changing over time?

e.g. - Long-term trends – statistical trend analysis

C. What watershed factors affect water quality?

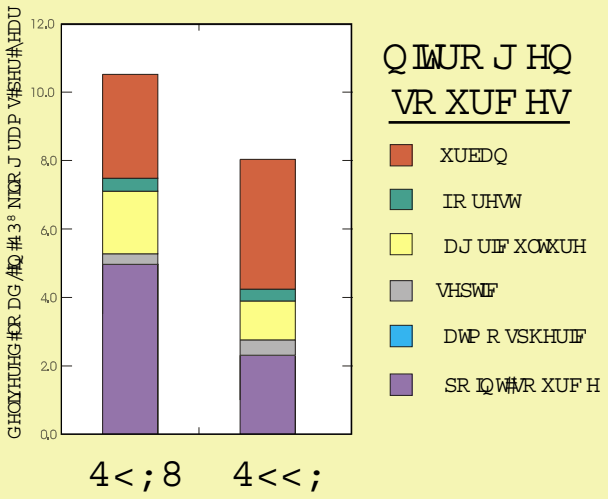
e.g. - Effectiveness of BMP's - watershed modeling

D. Research / Education

Factors Affecting Nutrient Trends In Major Rivers of the Chesapeake Bay Watershed

Sprague and others (2000)

WRIR 00-4218



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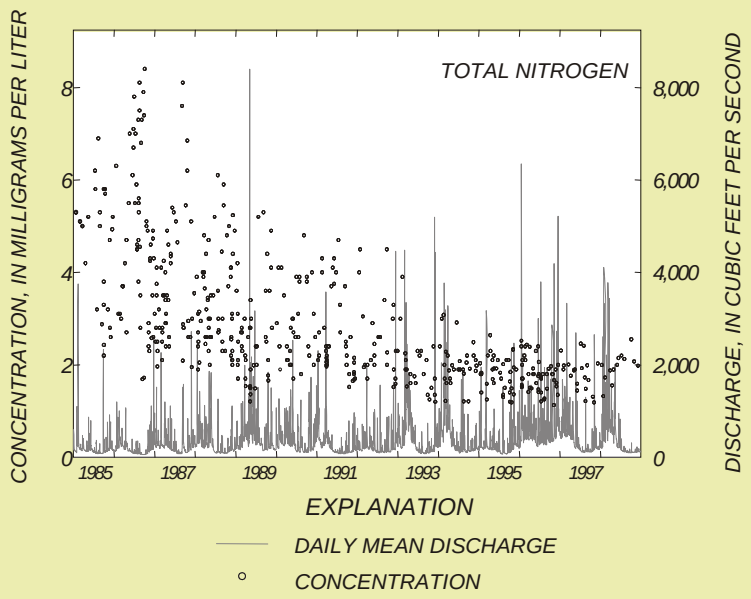

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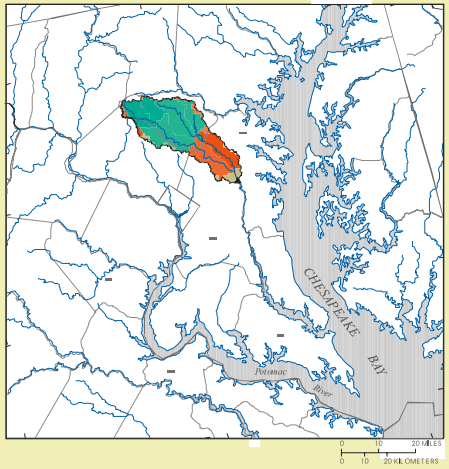

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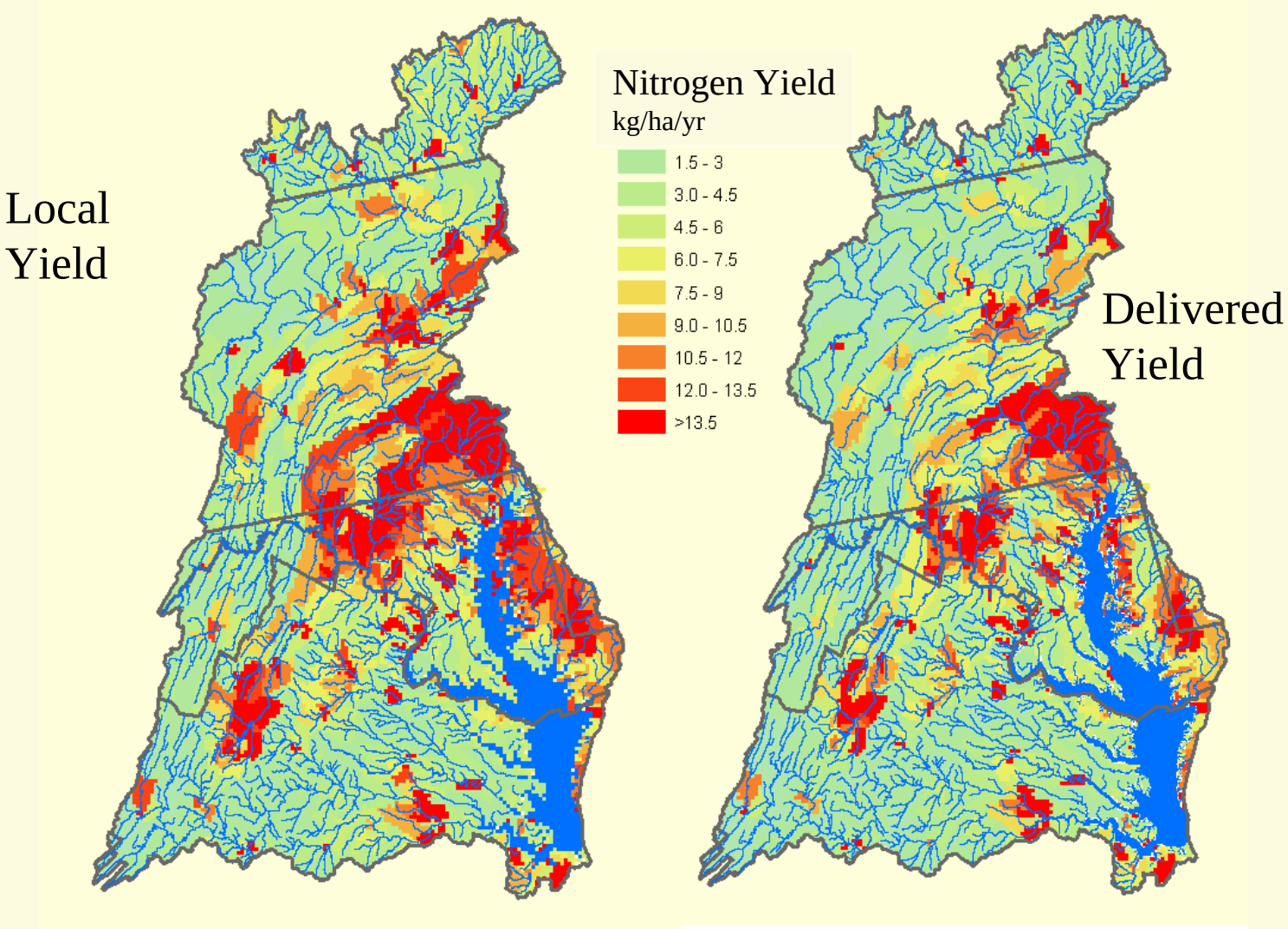
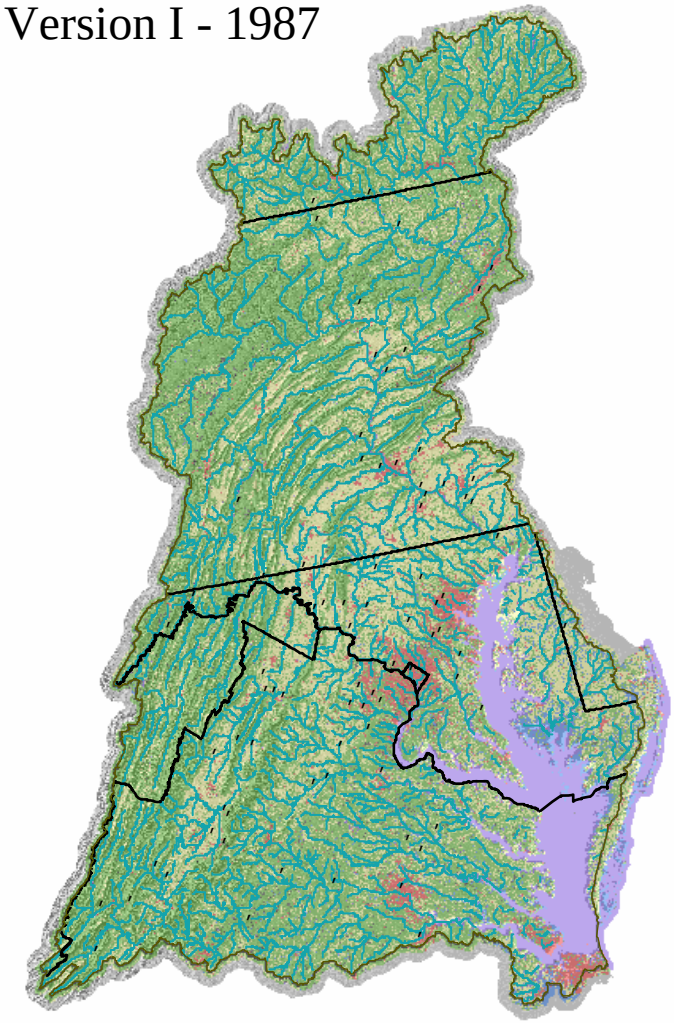
Chesapeake Bay SPARROW Model Predicted Nitrogen Yields



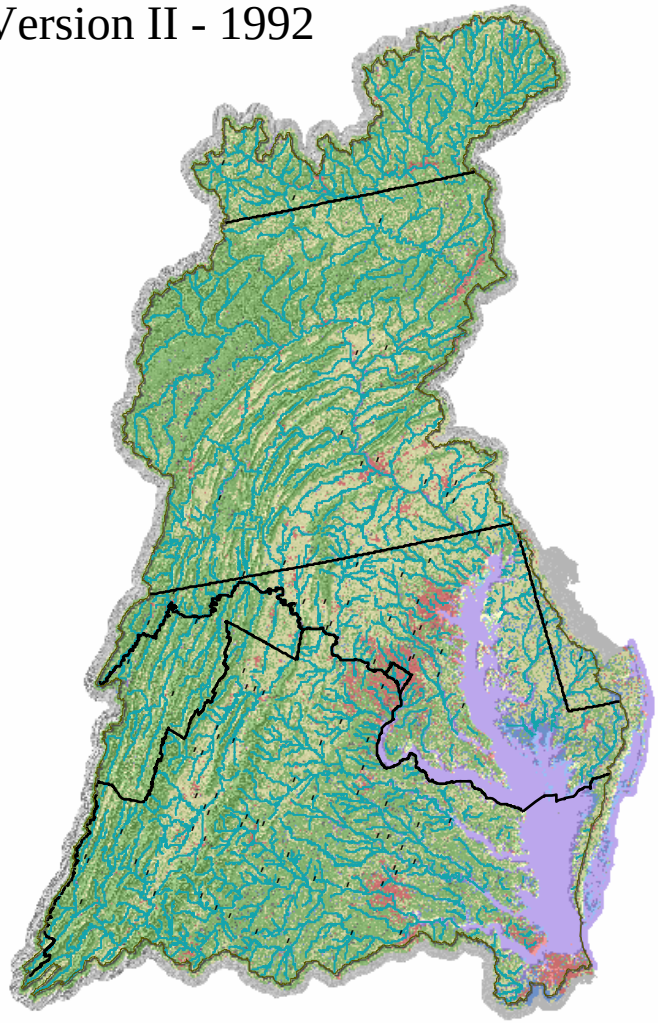
Chesapeake Bay SPARROW

Version I / Version II Total Nitrogen Load Sites

Version I - 1987

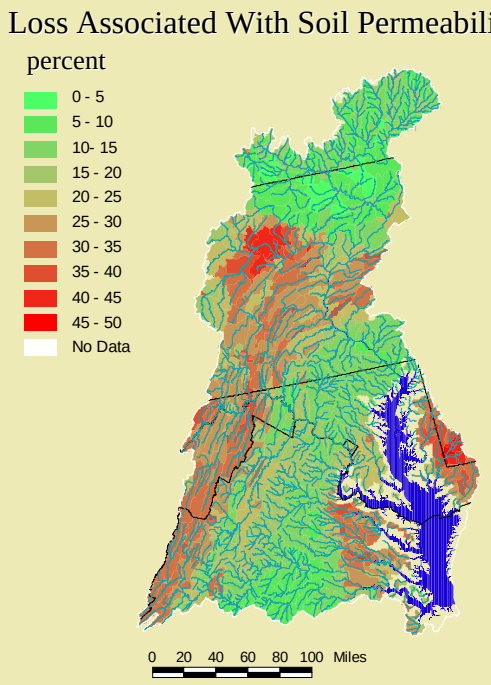


Version II - 1992



Chesapeake Bay SPARROW

Version I / Version II Land-to-Water Loss Terms



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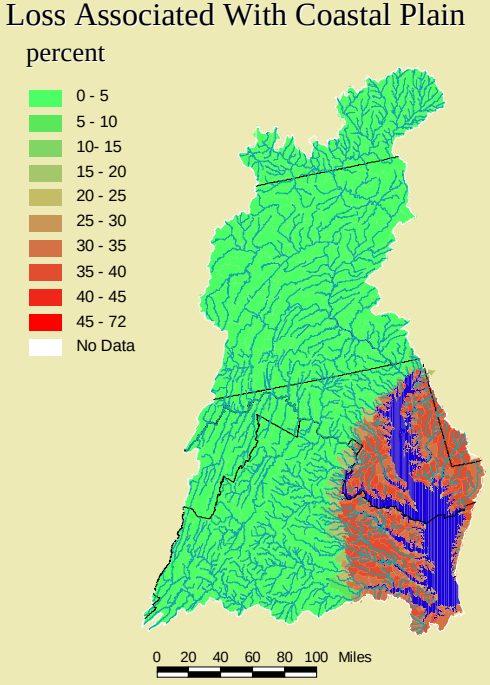


Version II - 1992

Design of a Chesapeake Bay Non-Tidal Monitoring Network

1. Must be Collaborative Among the Chesapeake Bay Program Partners in Order to Maximize the Use of Available Funds

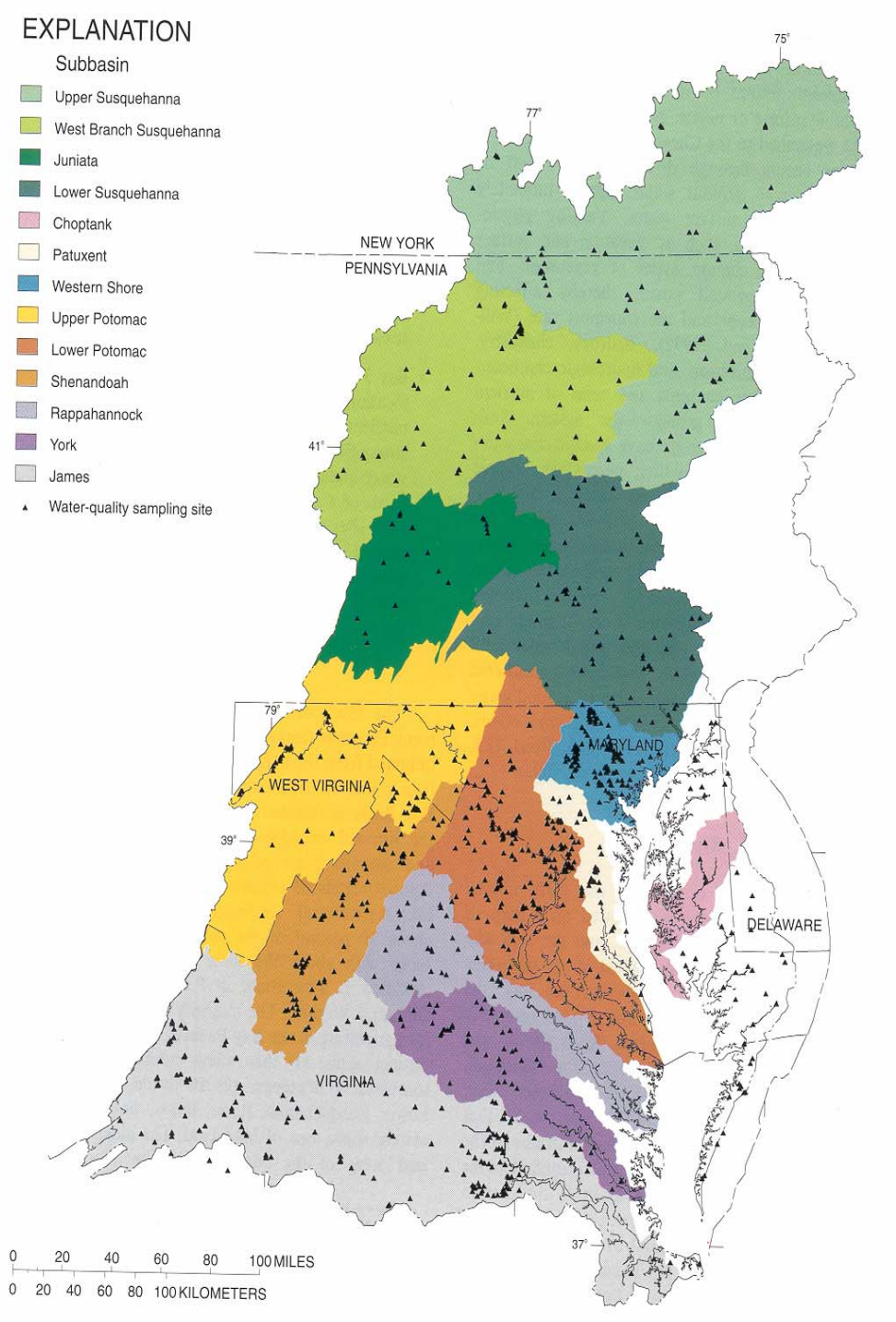
2. Need a Means of Coordination to Ensure Consistency and Address Problems as They Arise

3. Need a Common Network Design in Order to Provide a Consistent Density of Information Across Jurisdictions

4. Need a Common Set of Sampling and Laboratory Analysis Protocols to Provide a Consistent Quality of Information

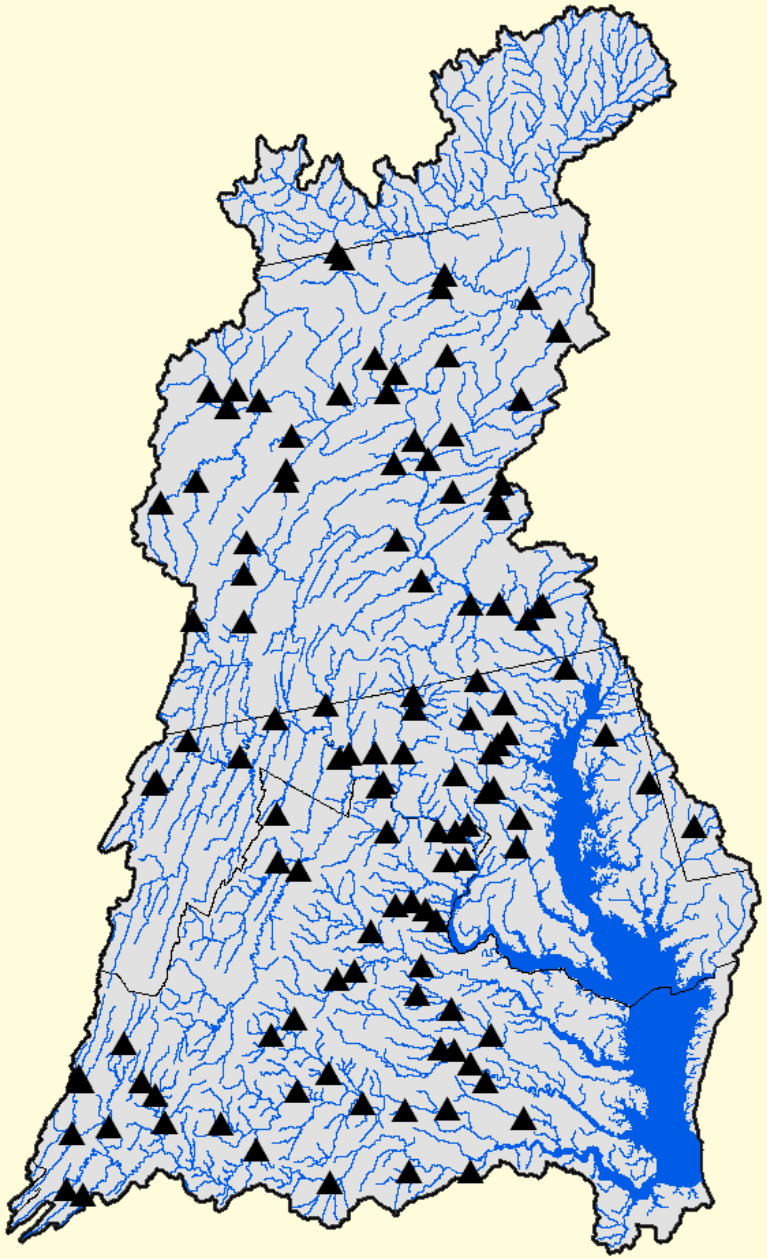
Initial Site Selection Process

- Wanted to build from existing networks
- Used nontidal database to assess ability of networks to meet new nontidal objectives
- Requirements of a site
  - Current
  - Stream flow gage
  - Samples collected at least monthly
  - Minimum of 3 years of data



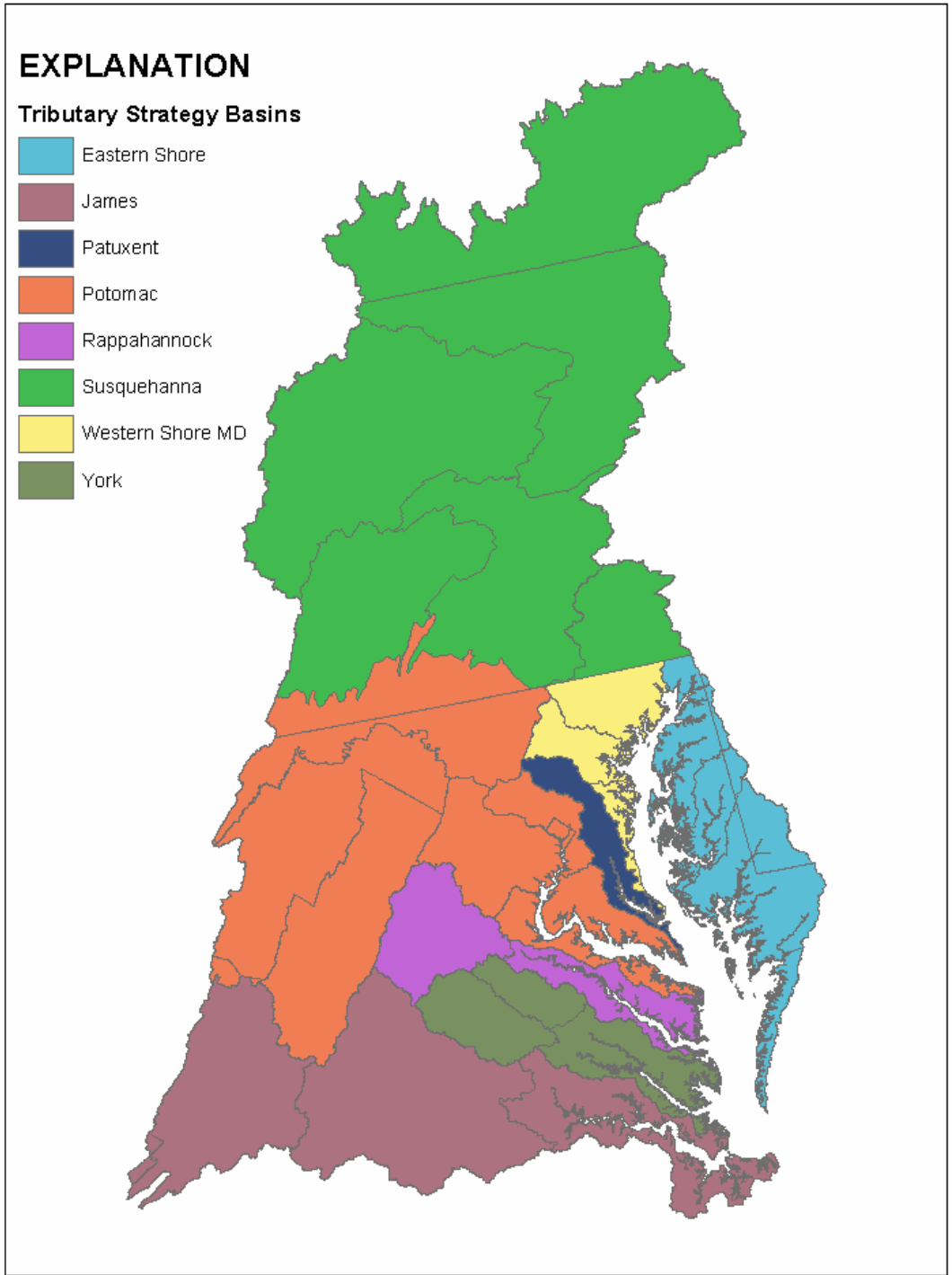
Initial Site Selection Process

- 703 Stream Gages
- >1700 Water Quality
- 313 Active Stream Gages
  389 Active Water-Quality
- 176 QW Associated with Stream Gages
- 118 Sites Meet Frequency and/or Parameter Criteria for trends



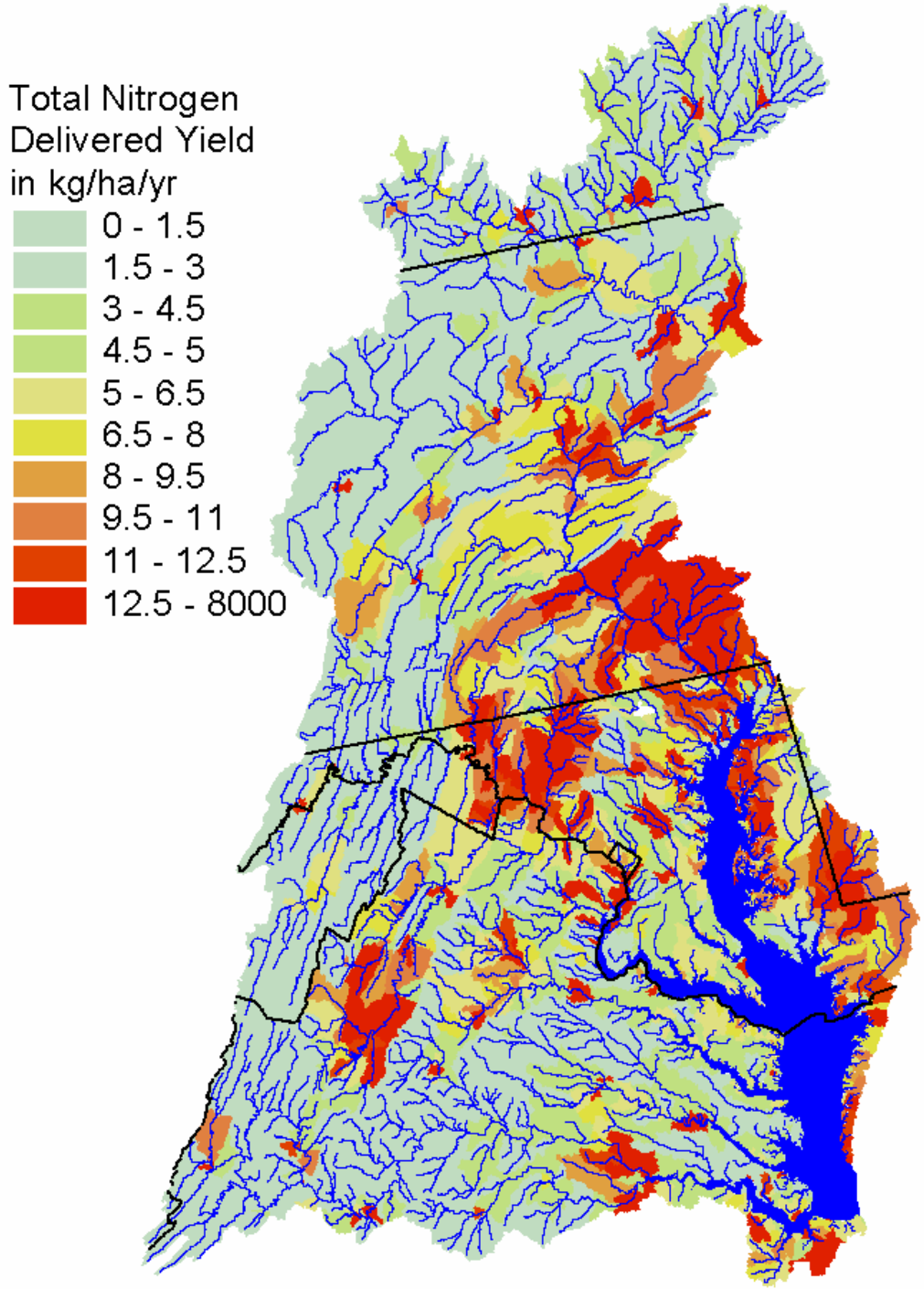
Adequacy of Initial Network for Tributary Strategy Support

- Available Sites Not Necessarily Selected for Bay Objectives
- Not All Basins Covered
- Many Basins Have Multiple Streams Draining Them



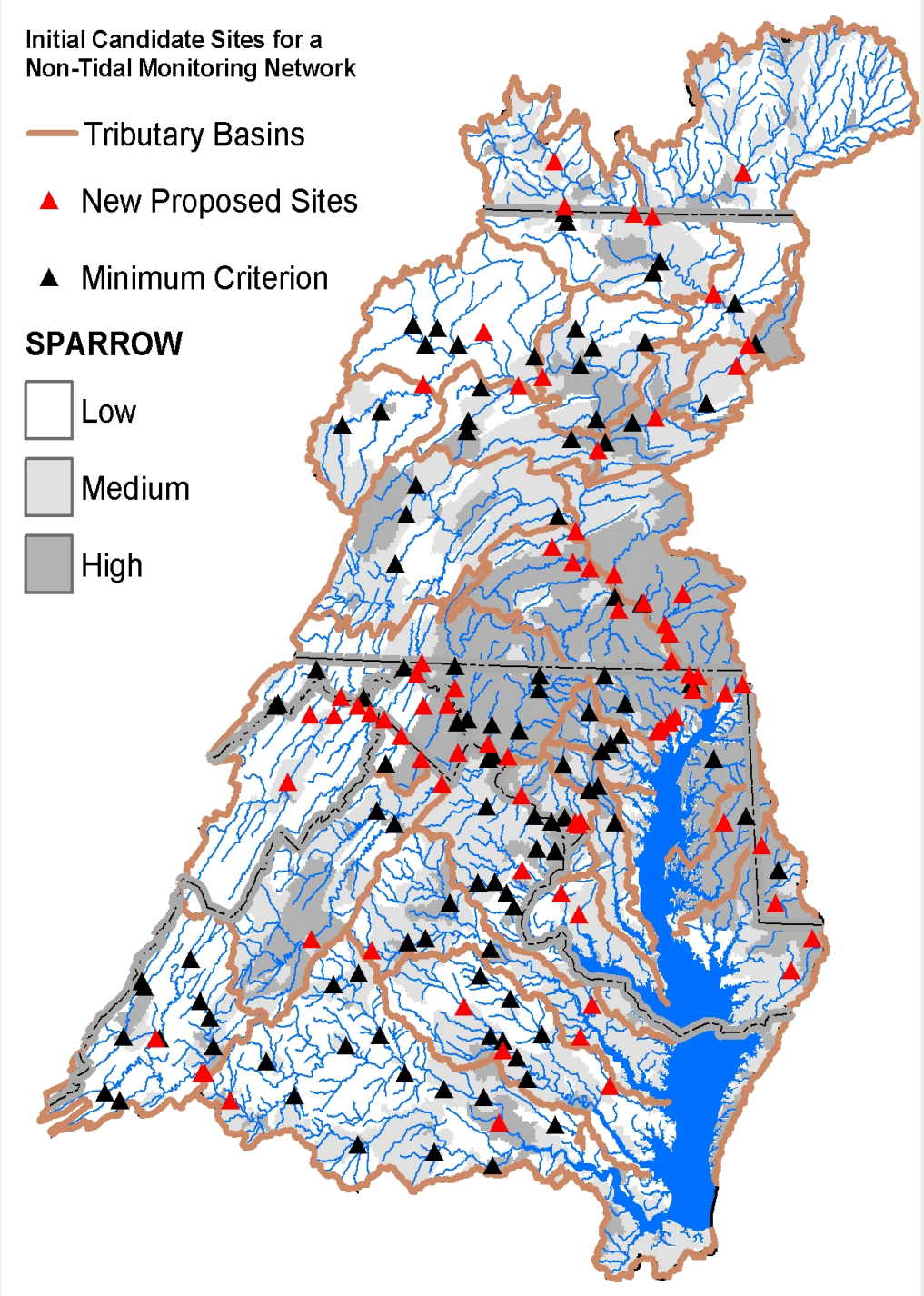
Adequacy of Initial Network for Tributary Strategy Support

- Existing Sites Not Necessarily Selected to Track Load Reductions
- Existing Sites Not Necessarily Targeted Toward High Loading Areas



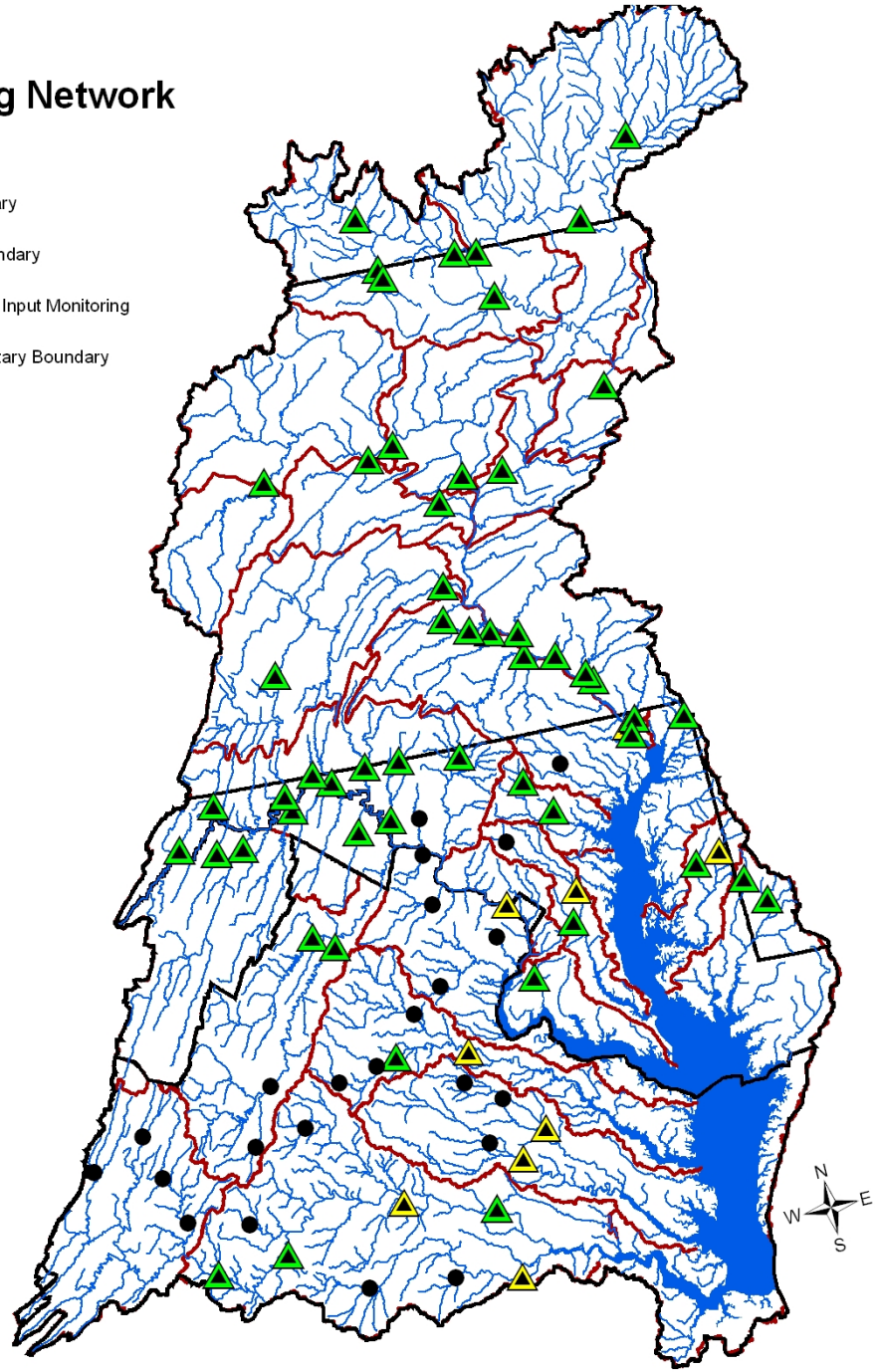
Proposed Initial Network Design

- About 200 potential sites
  - Enhancement of existing sites
  - Potential new sites
- Summarized in CBP report, Sept 2004 and MOU
- Bay Program Seed Money was Provided to Allow Flexibility in State Plans
- States Preferred to Keep Some Sites the Same to Maintain Trend



Implementation Progress

- States identified 86 sites to be implemented for the initial network
- Some 23 sites will be used only for trend assessment
- Some 63 sites currently meet the requirement for estimating load and are considered primary sites for the network



A Work in Progress……

Phase I - Targeted Monitoring Design

- Continue to look for efficiencies
- Continue to look for new funding opportunities
- Continue to work toward consistency in methods
- Develop data management capability
- Develop data analysis plan

Phase II - Representativeness

Conclusion
Factors Important to Success in Network Development

- Central Coordinating Organization
- Common Goal
- Seed Money
- Funds to Support Coordination

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