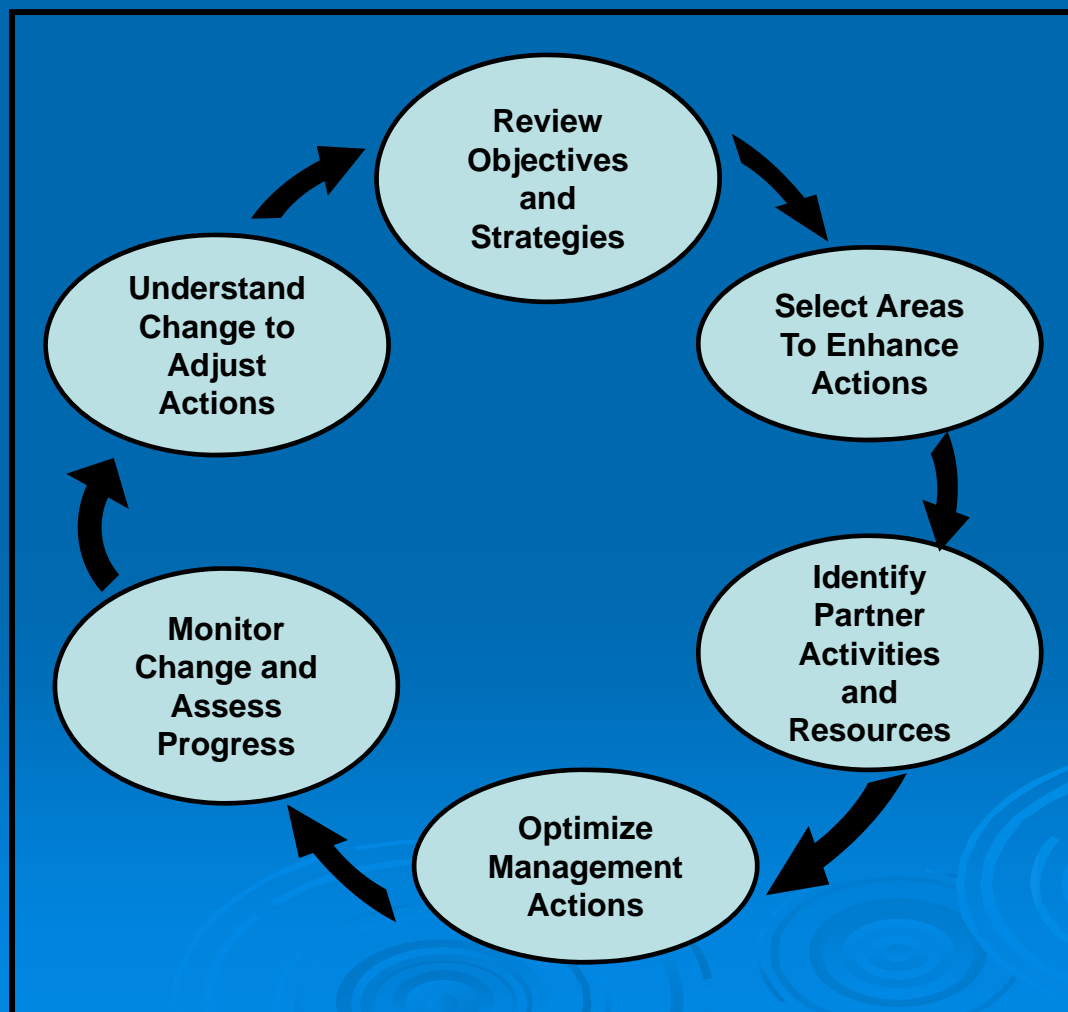


# Selecting Priority Agricultural Watersheds

*Implementing agricultural conservation  
practices that benefit the Chesapeake Bay*



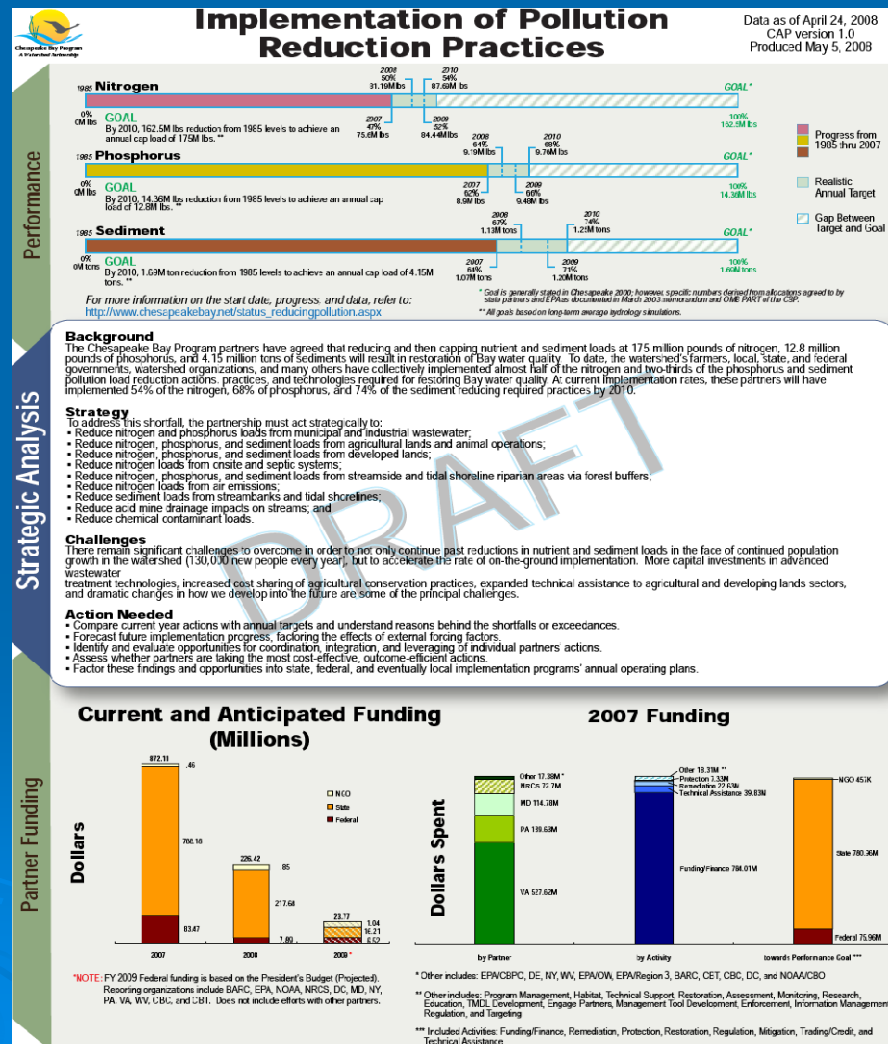
# Chesapeake Online Adaptive Support Toolkit (COAST)





# COAST: Objectives and Strategies

- CBP restoration and protection goals
- C2K and CAP
- State tributary strategies
- Dashboards





# COAST: Select Areas to Enhance Actions

- Select areas to enhance actions
  - Protection
  - Restoration
  - “Source sectors”
- SPARROW model
- Additional information

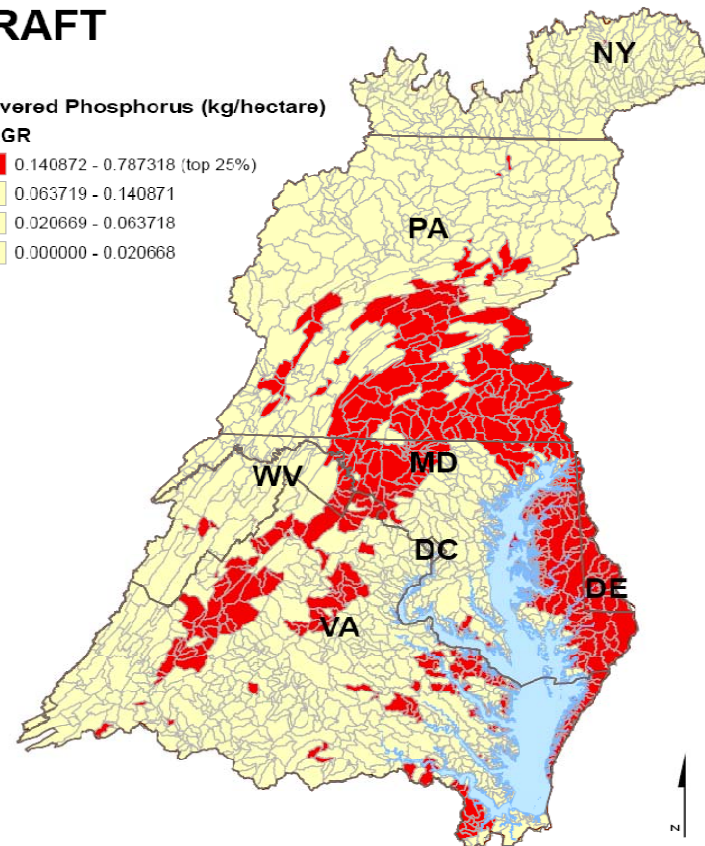
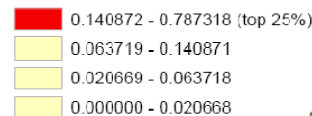
## Delivered Yield of Phosphorus - Agriculture Factors Impacting Bay Health



### DRAFT

Delivered Phosphorus (kg/hectare)

DYAGR



Data source:  
USGS - 1997 SPARROW



# COAST: Identify Partner Activities and Resources

- Provide information about current partner activities and resources to help enhance coordination
- Primary tool:
  - CAP activity database
- Contains information on:
  - Activities implemented
  - Cooperating partners
  - Source of funding
  - Location of activity

Chesapeake Action Plan

ACTIVITY CATEGORIES

Welcome EPA user!

Below, you will find a list of activities for your organization. The activities are organized by pillar and topic area. For additional assistance, click on the Reporting Guidance link at the top right of the screen.

To view existing activities and associated funding information, or add new activities and funding information, please then select a Topic Area from the respective dropdown list.

**Pillar 1: Restoring Healthy Waters (10 Topic Areas)**

Wastewater Treatment (15 Activities [2008])

		Topic Area	Activity Category
<a href="#">View/Modify</a>	1	Wastewater Treatment	Monitoring
<a href="#">View/Modify</a>	2	Wastewater Treatment	Assessment
<a href="#">View/Modify</a>	3	Wastewater Treatment	Program Management
<a href="#">View/Modify</a>	4	Wastewater Treatment	Information Management

**Pillar 2: Restoring Healthy Habitats (5 Topic Areas)**

**Pillar 3: Ecosystem-Based Fisheries Management (7 Topic Areas)**

**Pillar 4: Maintaining Healthy Watersheds (5 Topic Areas)**

**Pillar 5: Fostering Chesapeake Stewardship (6 Topic Areas)**

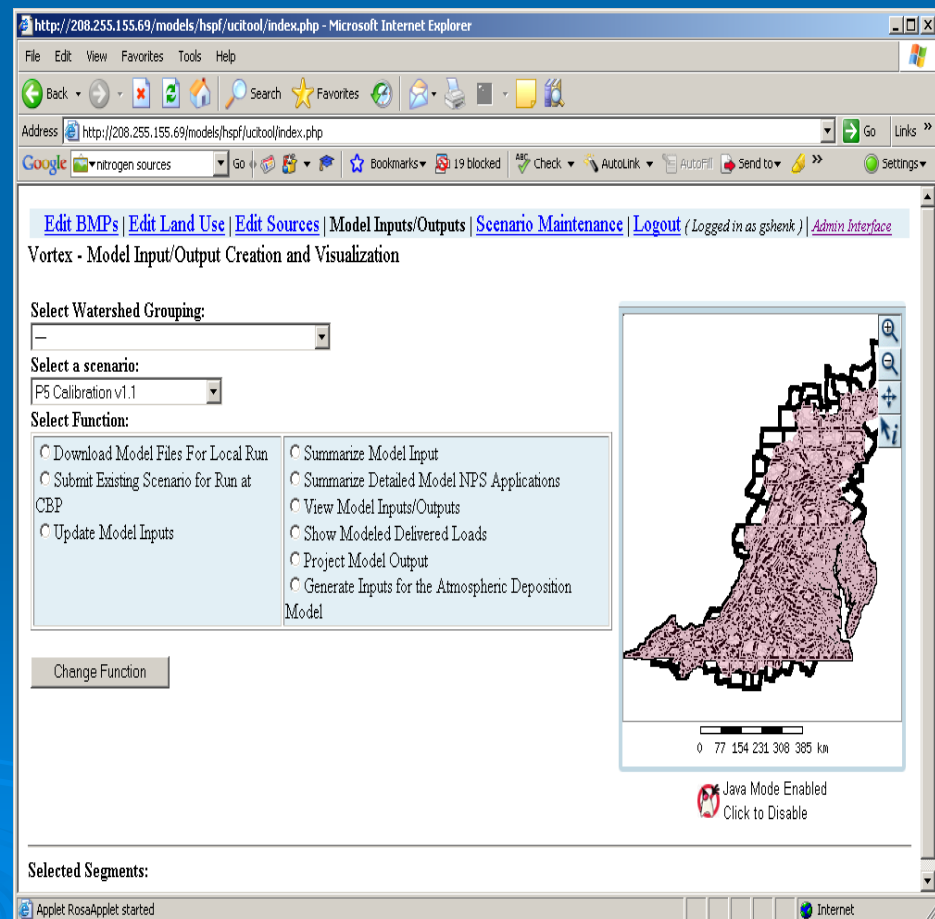
**Pillar 6: Partnership, Leadership & Management (3 Topic Areas)**

[Reporting Guidance](#) | [Contact Us](#) | [Help](#)



# COAST: Optimize Management Actions

- Scenario testing
- Actions providing greatest reductions:
  - Local areas
  - Bay loads
  - Cost effectiveness
- Tools:
  - Nutrient & Sediment Scenario Builder
  - Phase 5 Watershed Model

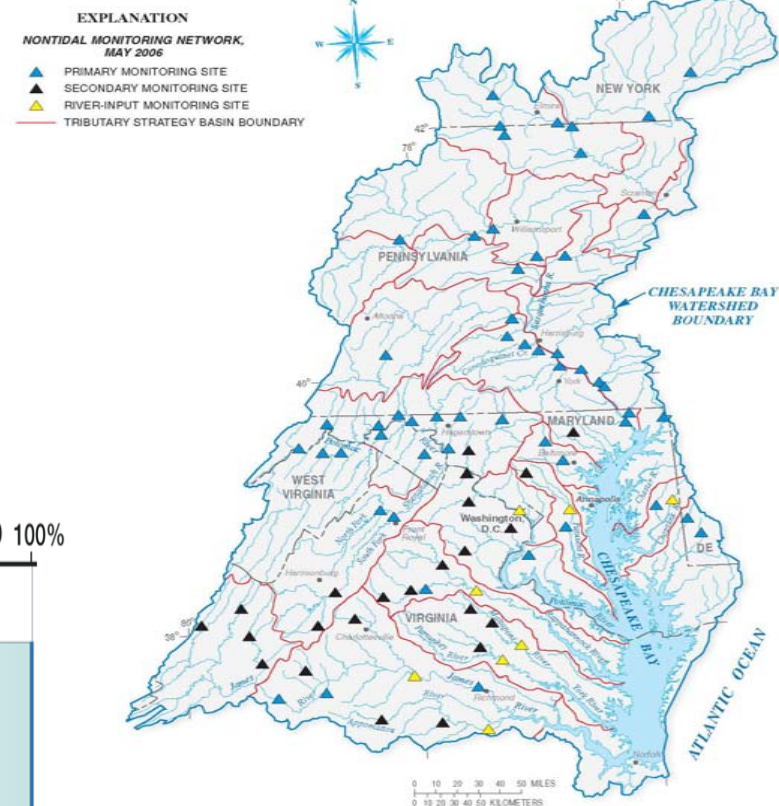
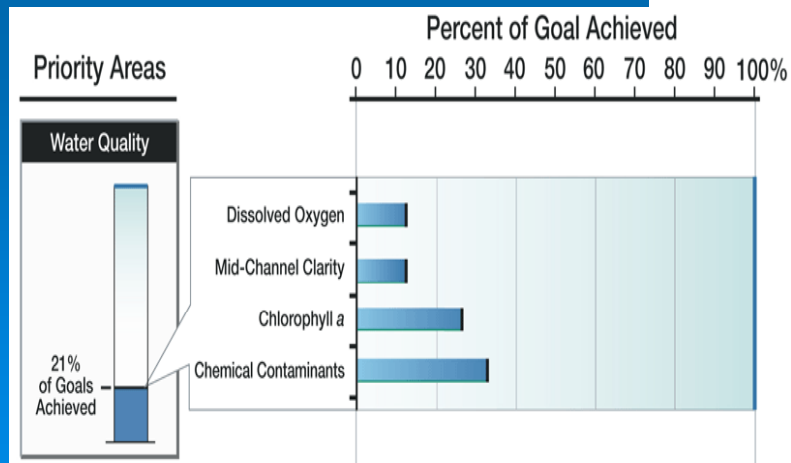






# COAST: Monitor Change and Access Progress

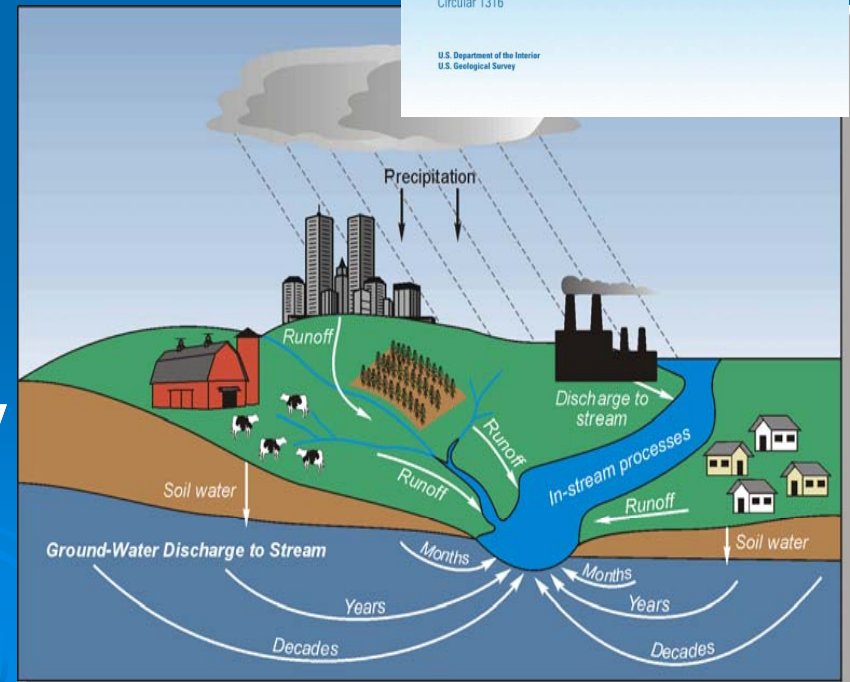
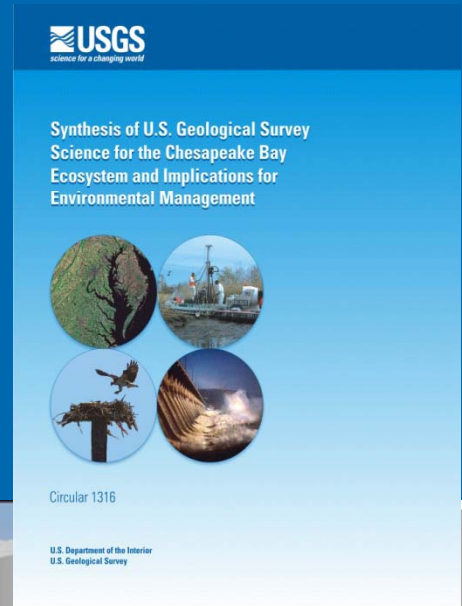
- Evaluate effectiveness
- CBP Non-tidal Network
  - Loads
  - Trends
- Indicators





# COAST: Understand Change to Adjust Actions

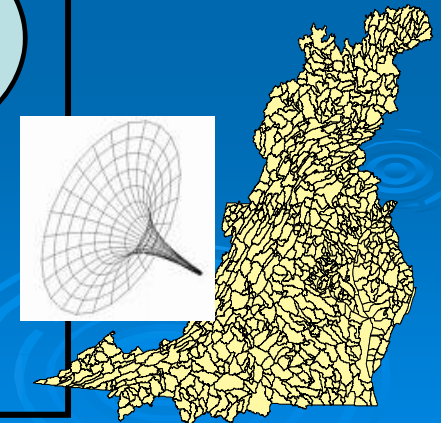
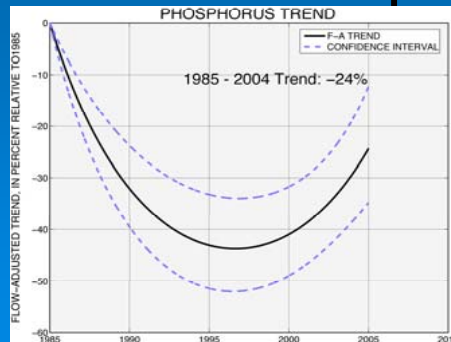
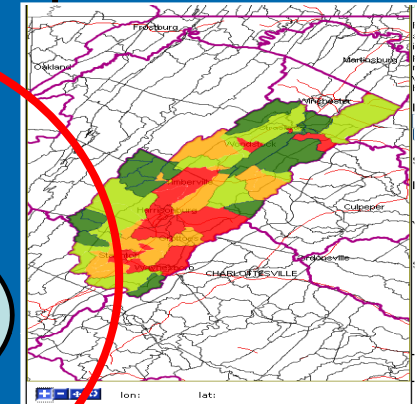
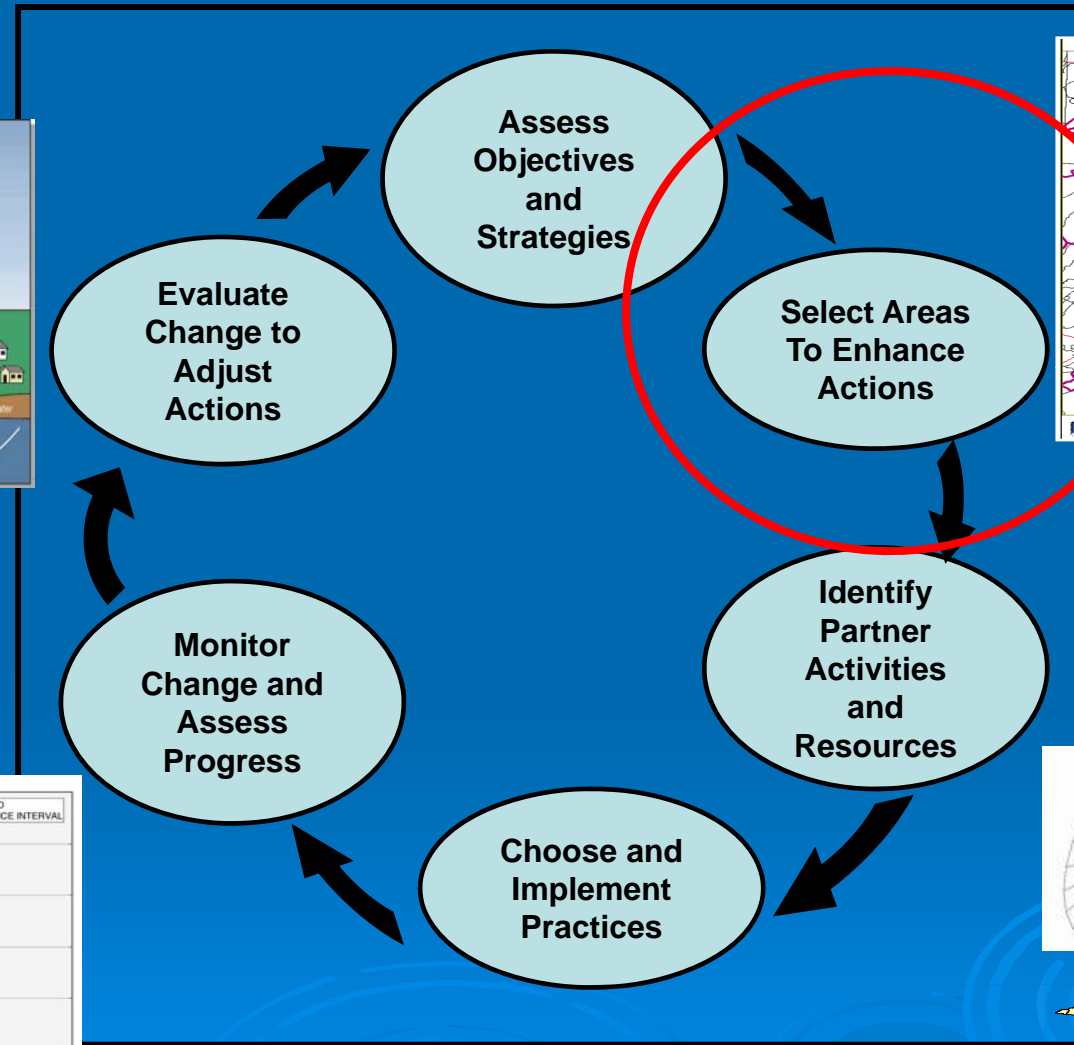
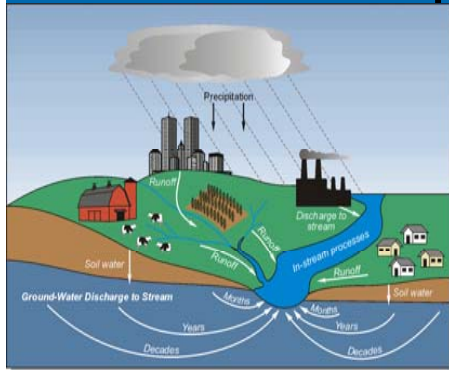
- Understanding the factors affecting water-quality change will help adjust actions
- Water-quality factors:
  - N and P sources
  - Land-use change
  - Management actions
  - Stream flow variability
  - “Lag times”
  - Watershed properties
  - GW and response times





# COAST and Adaptive Management

You are Here



# Selecting Priority Agricultural Watersheds

## Criteria

- Criteria 1: Nutrient Yields & Nutrient/DO Impairments
- Criteria 2: Water Quality Response
- Criteria 3: Implementation Opportunities



# Criteria 1: Nutrient Yields and Water Quality Impairments

- Identify areas with high nutrient yields, high agricultural land cover, and local nutrient or dissolved oxygen water quality impairments.

# Delivered Yield of Phosphorus - Agriculture

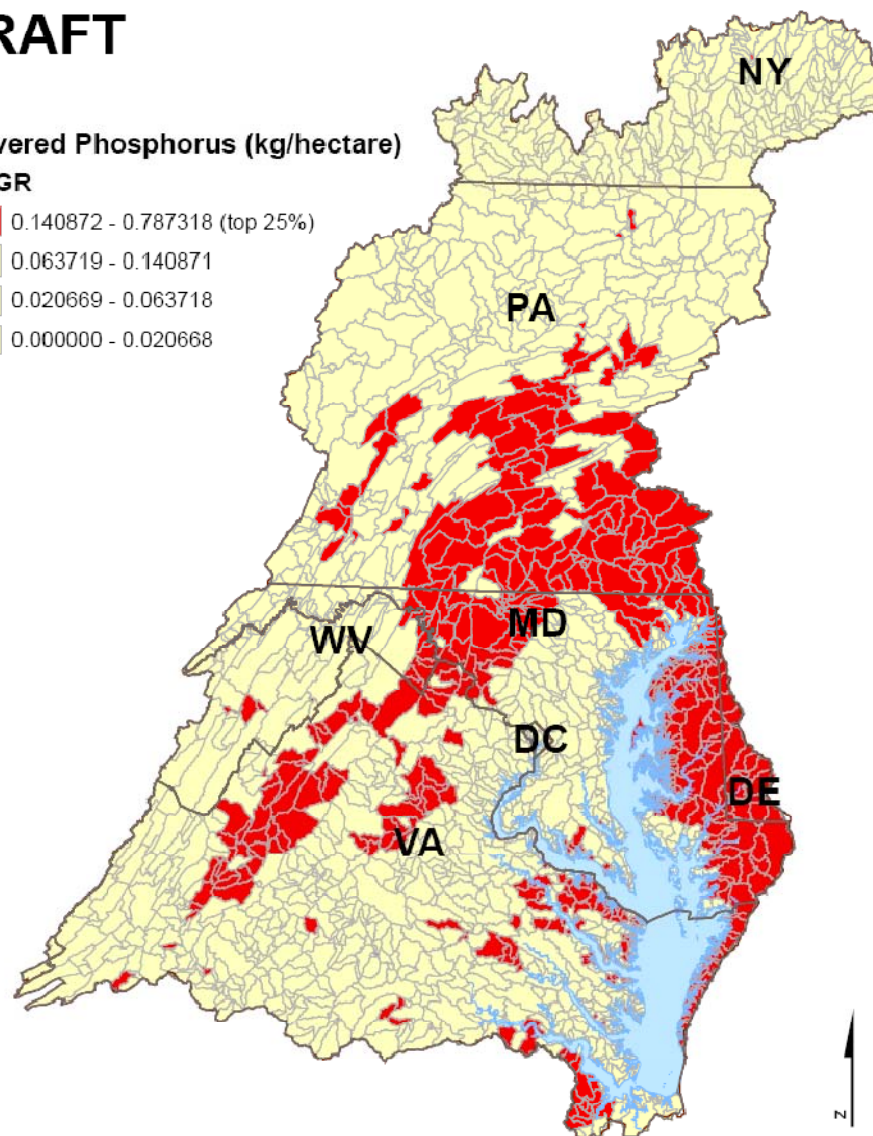
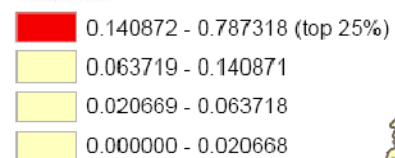
## Factors Impacting Bay Health



**DRAFT**

**Delivered Phosphorus (kg/hectare)**

**DYAGR**



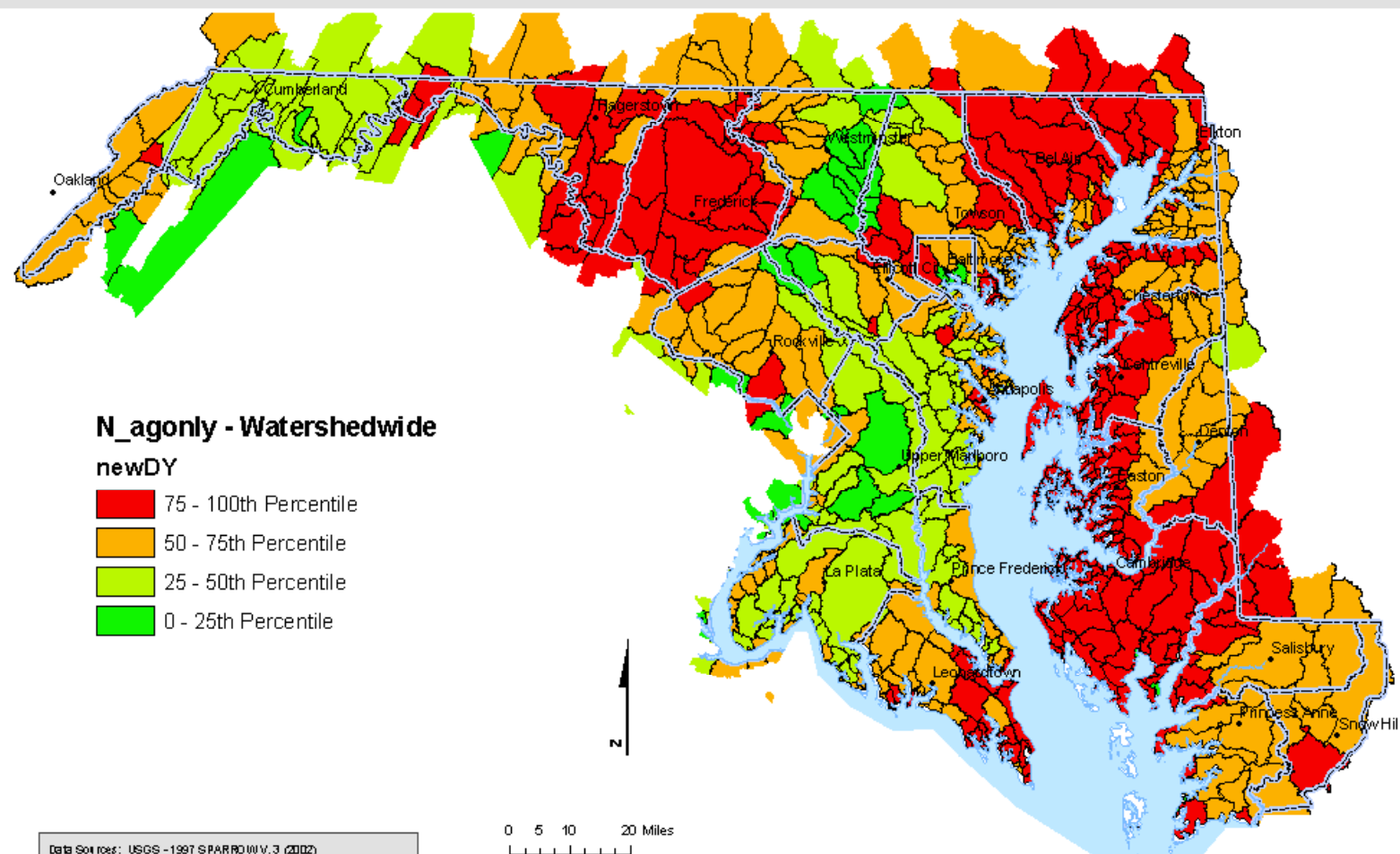
Data source:

USGS - 1997 SPARROW

0 20 40 80 Miles

# COAST: Maryland USDA-NRCS Project

## Delivered Yield of Nitrogen - Agricultural Lands Chesapeake Bay Watershed



Data Sources: USGS - 1997 SPARROW V.3 (2002)

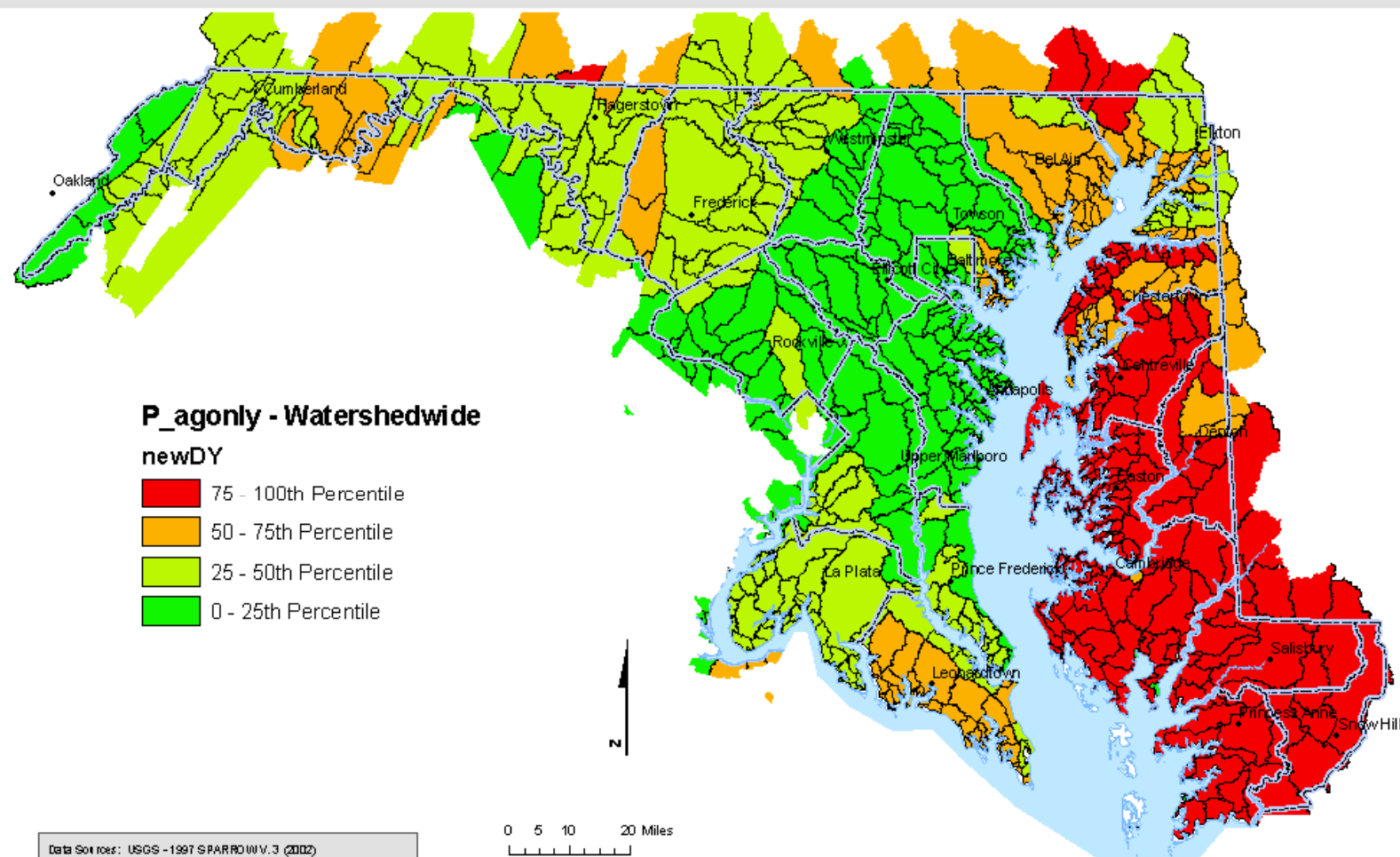
Disclaimer: [www.chesapeakebay.net/termsofuse.htm](http://www.chesapeakebay.net/termsofuse.htm)



# COAST: Maryland USDA-NRCS Project

## Delivered Yield of Phosphorus - Agricultural Lands

Chesapeake Bay Watershed

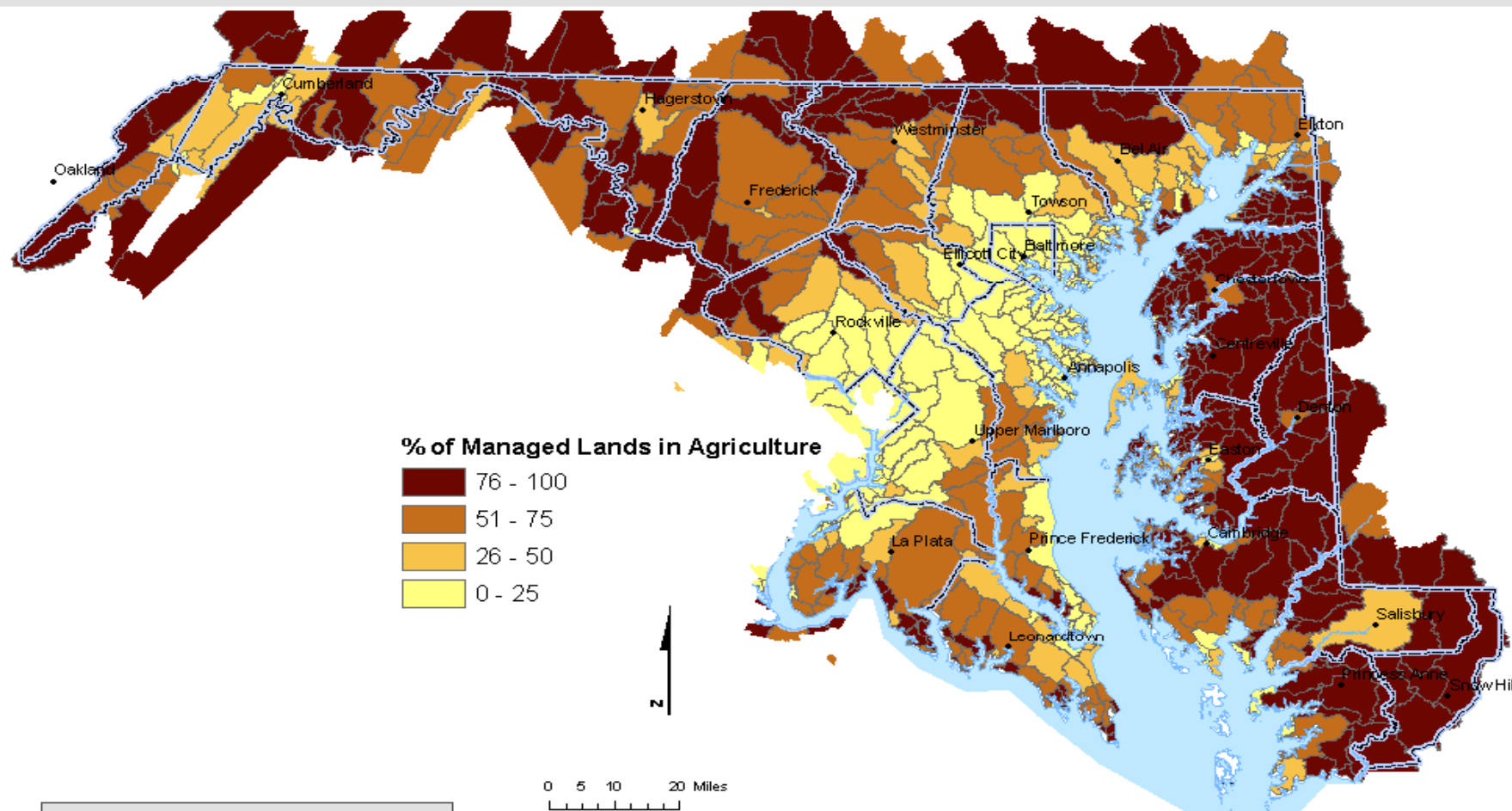


Data Sources: USGS - 1997 SPARROW V.3 (2002)

Disclaimer: [www.chesapeakebay.net/terms/sovereignty.htm](http://www.chesapeakebay.net/terms/sovereignty.htm)

# COAST: Maryland USDA-NRCS Project

## Percent of Managed Lands in Agriculture Chesapeake Bay Watershed within Maryland

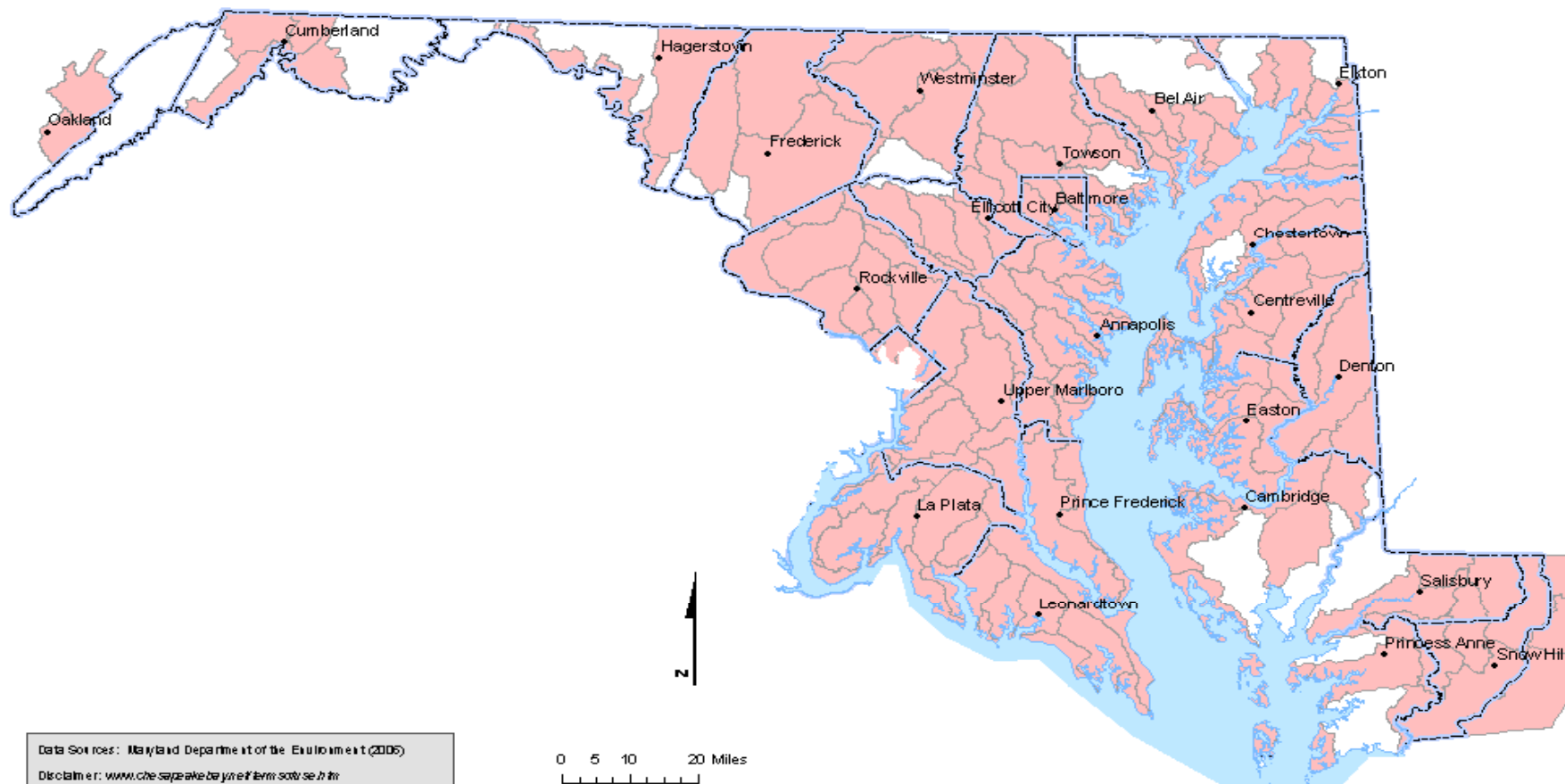


Data Sources: Chesapeake Bay Program  
Disclaimer: [www.chesapeakebay.net/terms/sovereignty](http://www.chesapeakebay.net/terms/sovereignty)

# COAST: Maryland USDA-NRCS Project

## Watersheds with Nutrient or DO Impairments

Maryland 8 Digit Watersheds

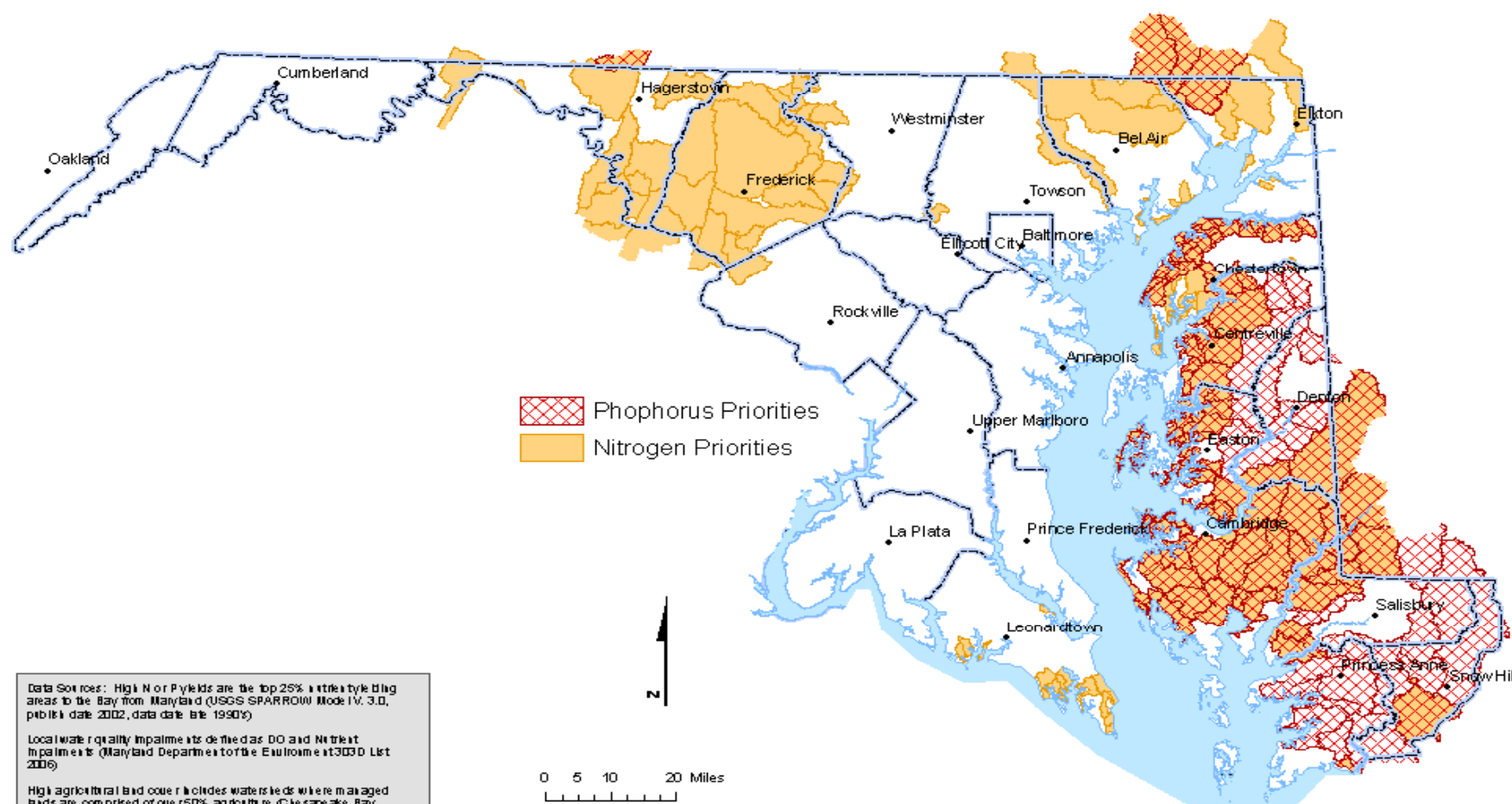


Data Sources: Maryland Department of the Environment (2005)

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# COAST: Maryland USDA-NRCS Project

**Areas with high N or P yields to the Bay from Maryland, high agricultural land cover, and local water quality impairments**



Data Sources: High N or P yields are the top 25% in the state by land area to the Bay from Maryland (USGS SPARROW Model v. 3.0, publish date 2002, data date late 1990's)

Local water quality impairments defined as DO and Nitrate impairments (Maryland Department of the Environment 303D List 2006)

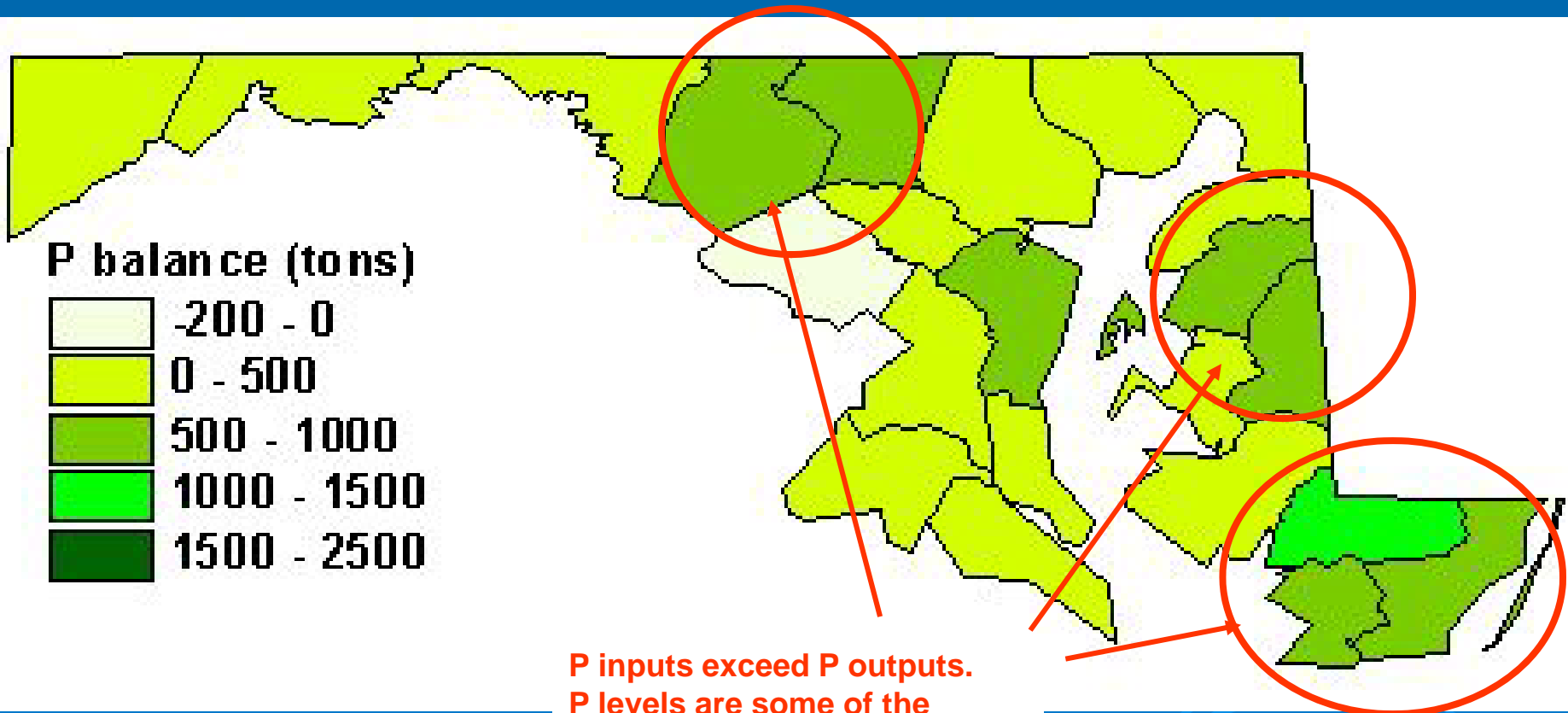
High agricultural land cover includes watersheds where managed lands are comprised of over 50% agriculture (Chesapeake Bay Program Phase 5 Watershed Model land cover 2005)

Disclaimer: [www.chesapeakebay.net/termsofuse.htm](http://www.chesapeakebay.net/termsofuse.htm)

USGS Sparrow assessment is less certain for coastal catchment areas due to limited monitoring stations.

# Other Data to Confirm Analysis

## 2002 Maryland Phosphorus Balance in Cropland - Includes Biosolids



**P inputs exceed P outputs.  
P levels are some of the  
highest P imbalances per acre  
in MD**

When the nutrient balance is close to zero, nutrients applied in manure and fertilizer are closely matched to crop utilization. When the nutrient balance is positive, nutrient inputs exceed outputs. When the nutrient balance is negative, nutrient outputs exceed inputs.



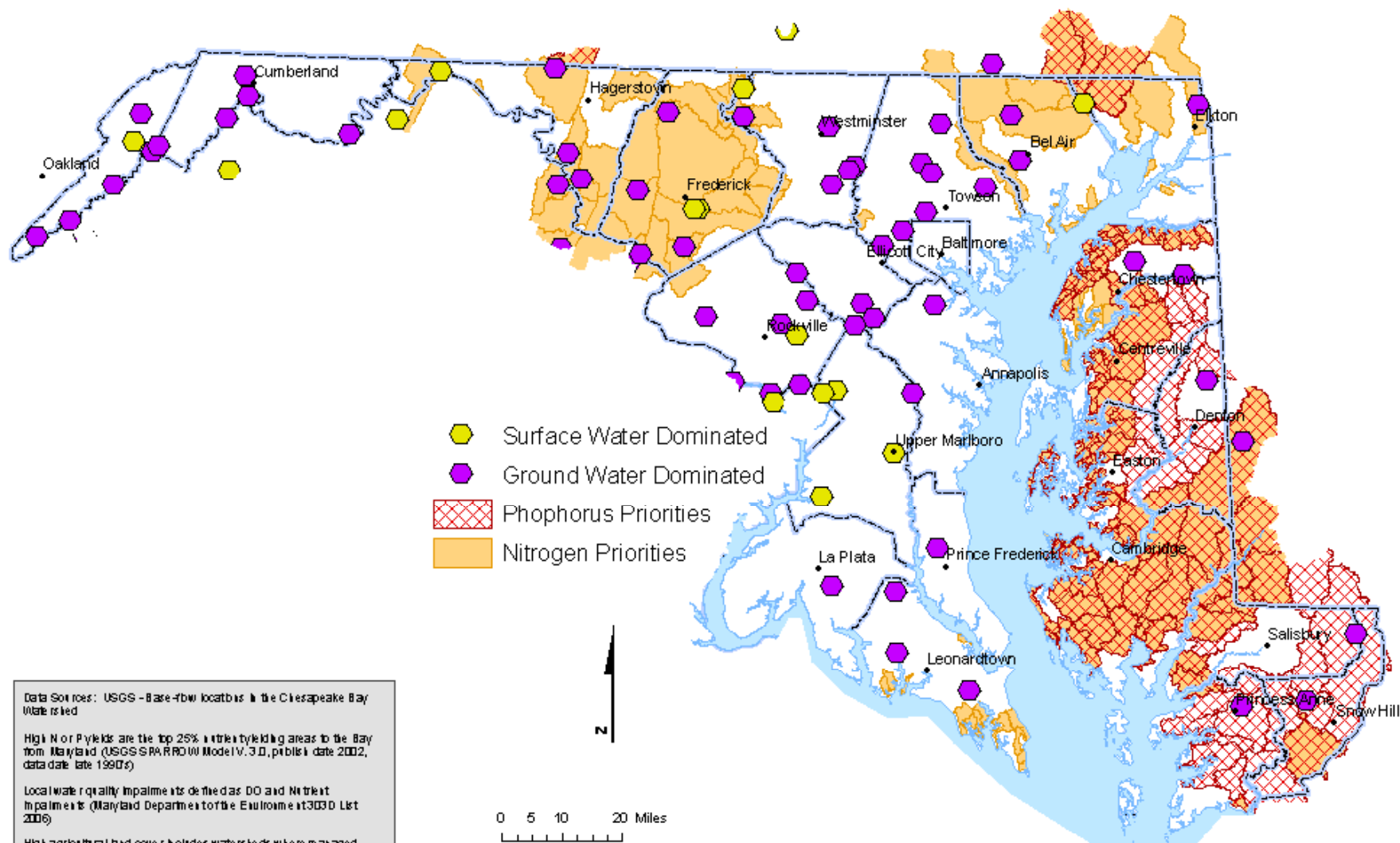
# Criteria 2: Water Quality Response

- Identify areas with the greatest opportunity for showing a water quality response from implementing agricultural conservation practices.
  - Information that can help assess how long it will take to see a water quality response.
  - Information that will help measure the response (monitoring/research)



# Baseflow Index

## Chesapeake Bay Watershed within Maryland



Data Sources: USGS - Base-flow locations in the Chesapeake Bay Watershed

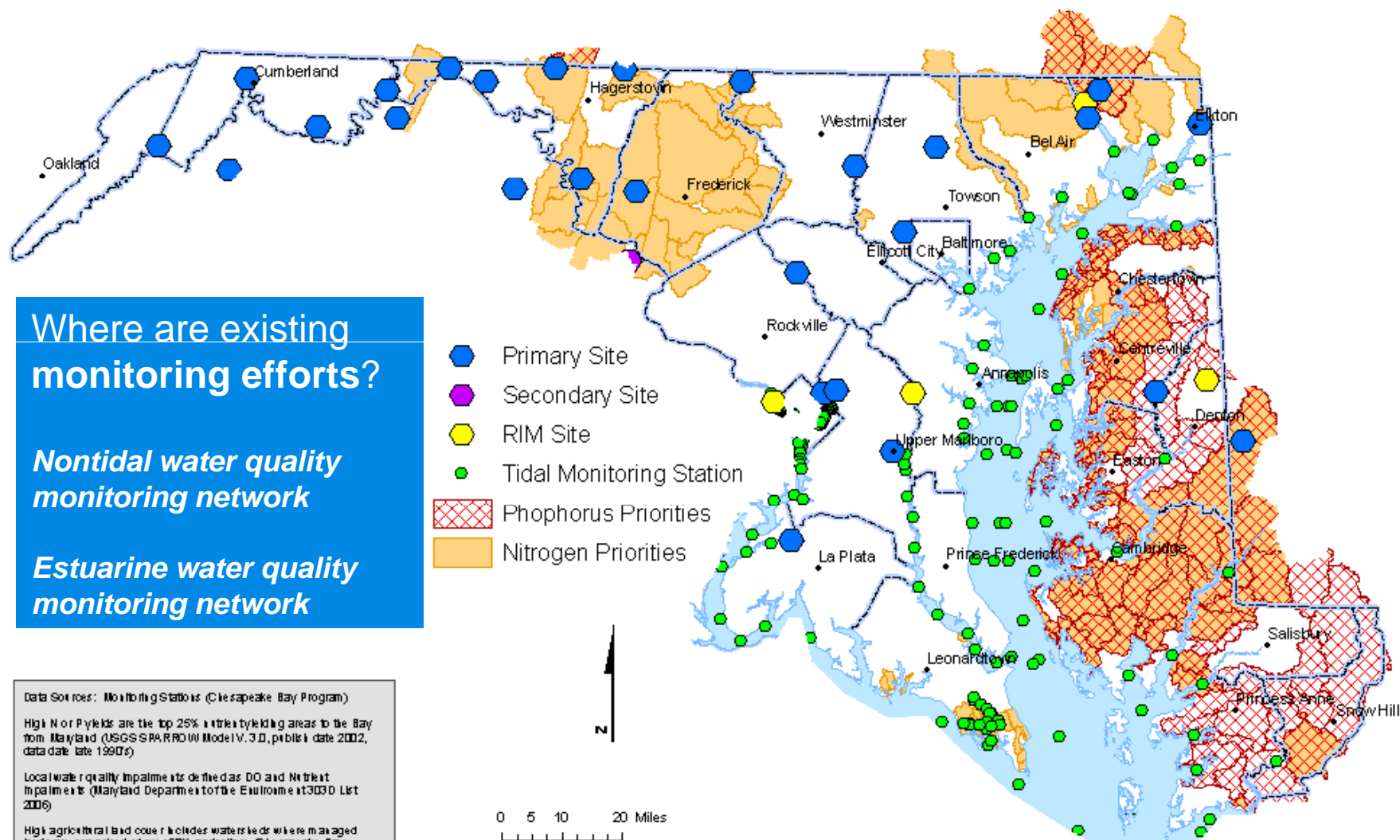
High Nitrogen Pools are the top 25% nitrogen yielding areas to the Bay from Maryland (USGS SPARROW Model V.3.0, published date 2002, data date late 1990s)

Local water quality impairments defined as DO and Nitrogen impairments (Maryland Department of the Environment 303D List 2006)

High agricultural land cover includes watersheds where managed lands are comprised of over 50% agriculture (Chesapeake Bay Program Phase 5 Watershed Model land cover 2005)

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# Chesapeake Bay Program Nontidal and Estuarine Water Quality Monitoring Network



Where are existing  
monitoring efforts?

*Nontidal water quality  
monitoring network*

*Estuarine water quality  
monitoring network*

Data Sources: Monitoring Stations (Chesapeake Bay Program)

High Nitrogen Yields are the top 25% nitrogen yielding areas to the Bay from Maryland (USGS SPARROW Model V.3.0, published 2002, data date: late 1990's)

Local water quality impairments defined as DO and Nitrogen impairments (Maryland Department of the Environment 303D List 2006)

High agricultural land cover includes watersheds where managed lands are comprised of over 150% agriculture (Chesapeake Bay Program Phase 5 Watershed Model land cover 2003)

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# Criteria 3: Implementation Opportunities

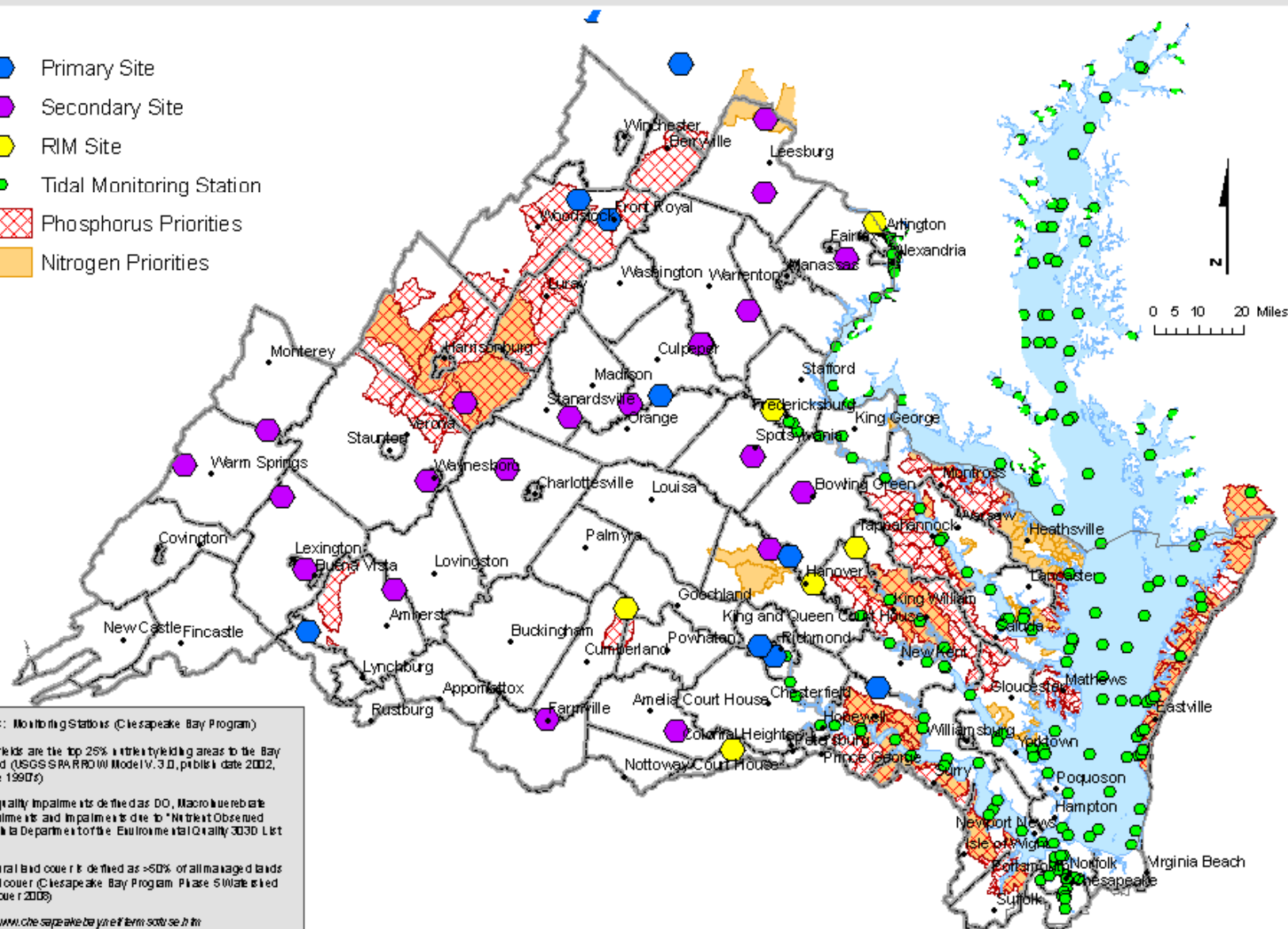
- Identify areas with the greatest potential for implementation
  - Ag implementation levels and capacity to implement more.
  - EQIP contract coverage
  - Technical assistance capacity.
  - Education & outreach capacity.
  - Private consultant willingness to promote practices.
  - Farmer willingness to implement practices.
  - Partner support.
  - Etc.



# Chesapeake Bay Program Nontidal and Estuarine Water Quality Monitoring Network



- Primary Site
- Secondary Site
- RIM Site
- Tidal Monitoring Station
- Phosphorus Priorities
- Nitrogen Priorities



Data Sources: Monitoring Stations (Chesapeake Bay Program)

High Nitrogen Yields are the top 25% nitrogen yielding areas to the Bay from Maryland (USGS SPARROW Model V.3.0, published 2002, data date: late 1990s)

Local water quality impairment is defined as DO, Macroinvertebrate, Nutrient impairment, and impairment due to "Nutrient Observed Effects" (Virginia Department of the Environment Water Quality 303D List 2006)

High agricultural land cover is defined as >50% of all managed lands in agricultural cover (Chesapeake Bay Program Phase 5 Watershed Model land cover 2003)

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# Chesapeake Bay Program Nontidal Water Quality Monitoring Network






Data Sources: Monitoring Stations (Chesapeake Bay Program)

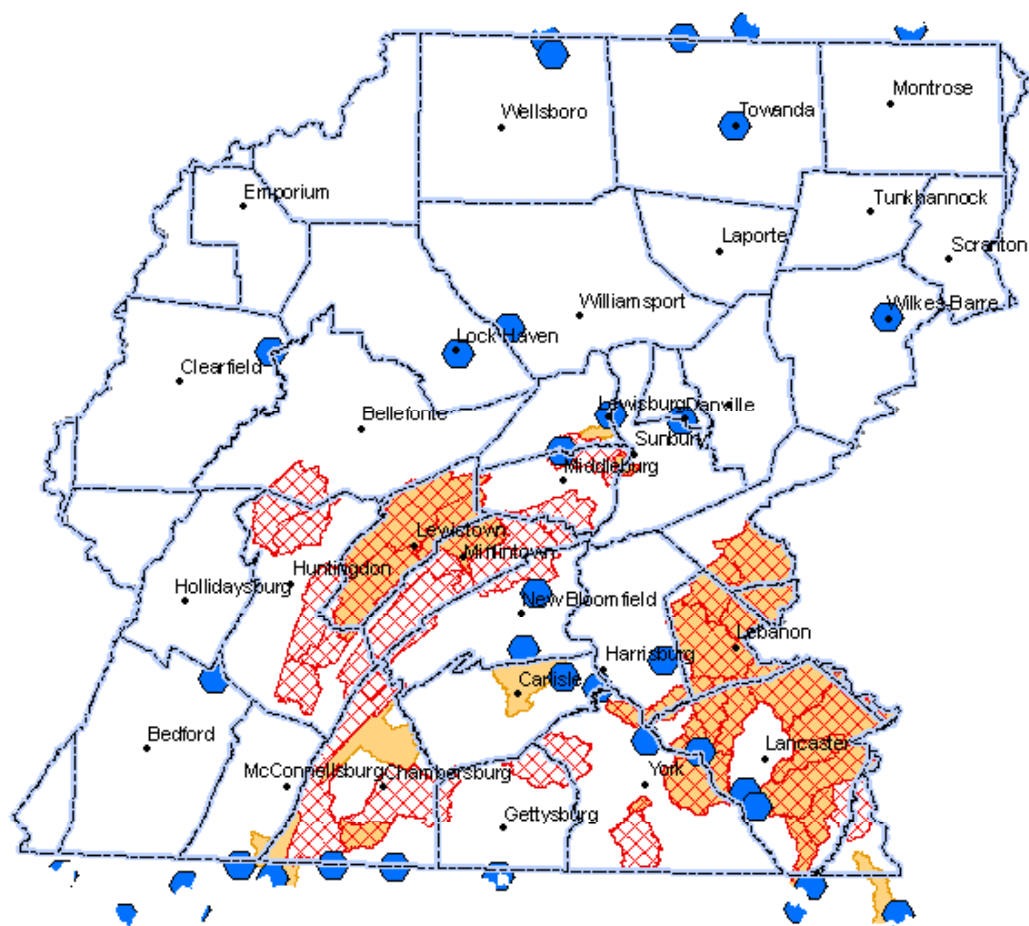
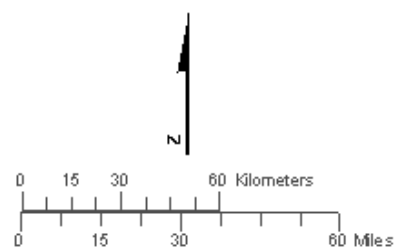
High Nitrogen Yields are the top 25% nitrogen yielding areas to the Bay from Maryland (USGS SPARROW Model IV, 3D, published date 2002, data date late 1990's)

Local water quality impairments (Pennsylvania Department of Environmental Protection 2006)

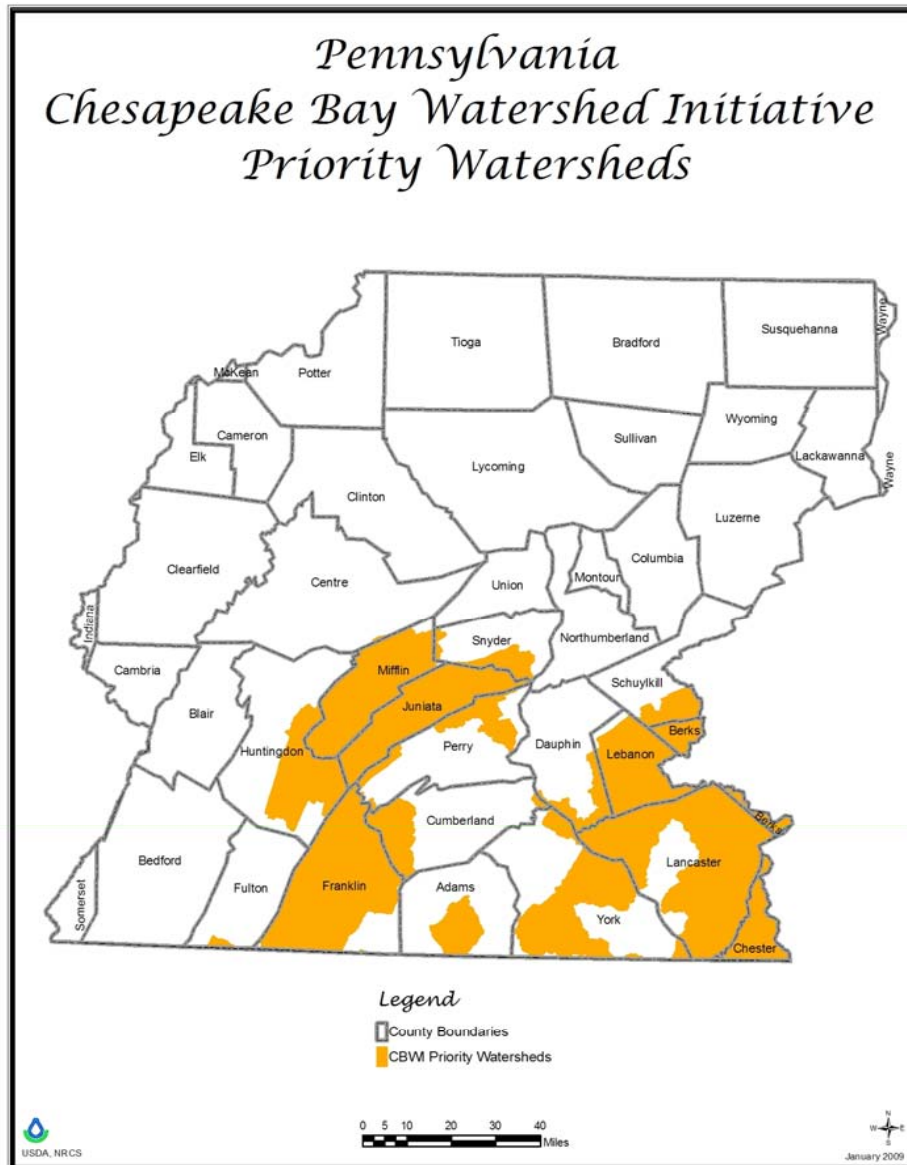
High agricultural land cover is defined as >50% of all managed lands in agricultural cover (Chesapeake Bay Program Phase 5 Watershed Model land cover 2008)

Disclaimer: [www.chesapeakebay.net/terms/usage.htm](http://www.chesapeakebay.net/terms/usage.htm)

-  Primary Site
-  Phosphorus Priorities
-  Nitrogen Priorities



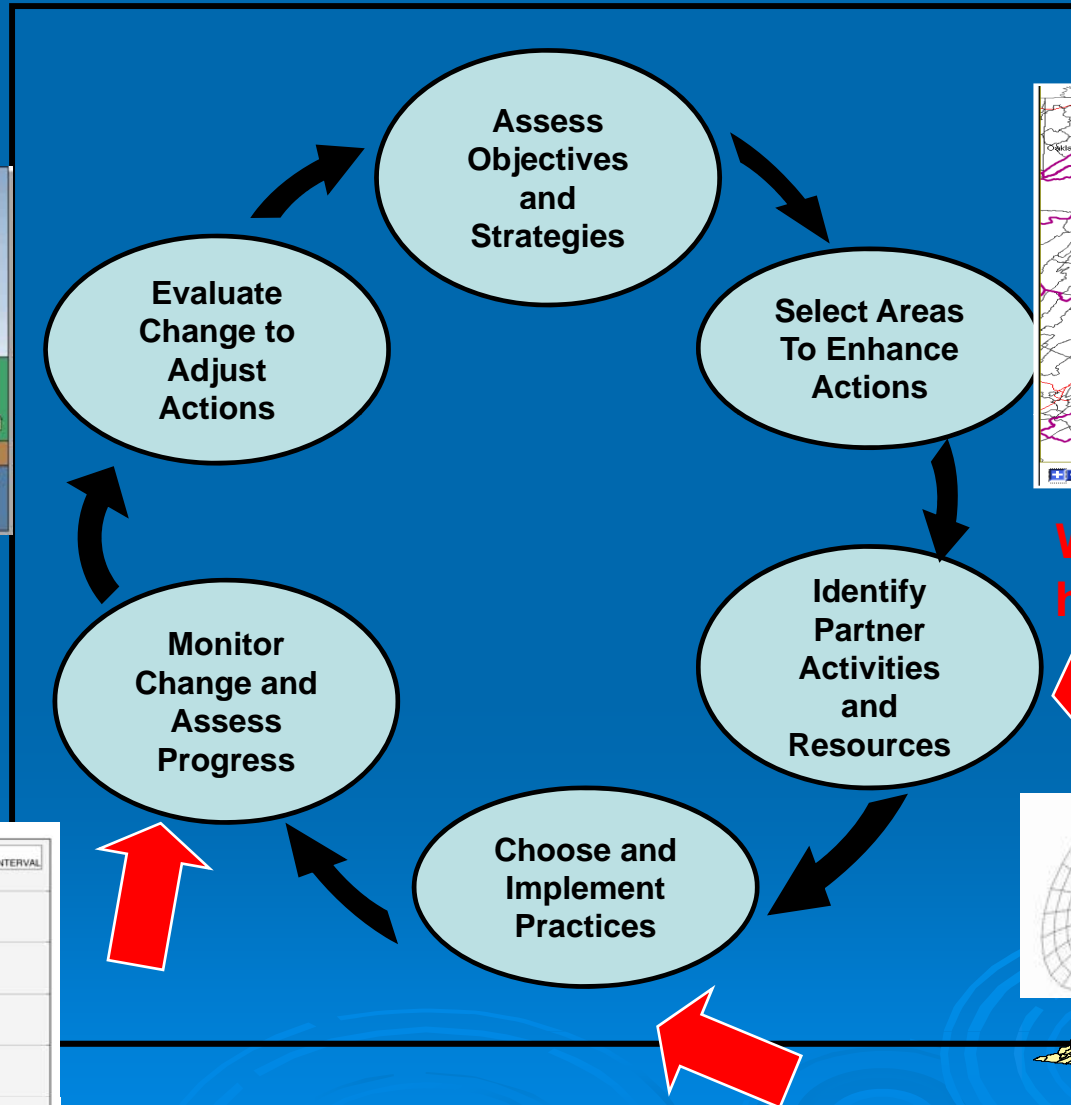
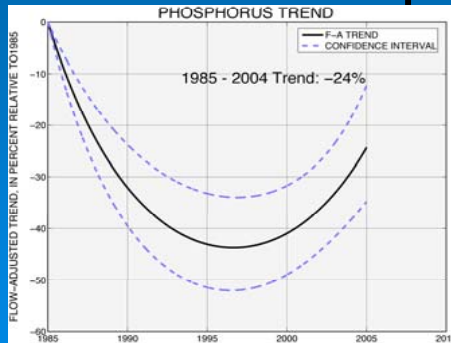
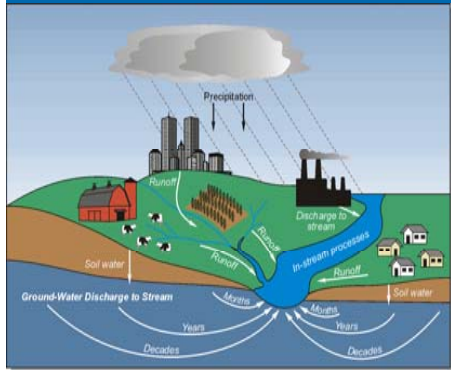
# PA Priority Watersheds for CBWI Farm Bill Funding



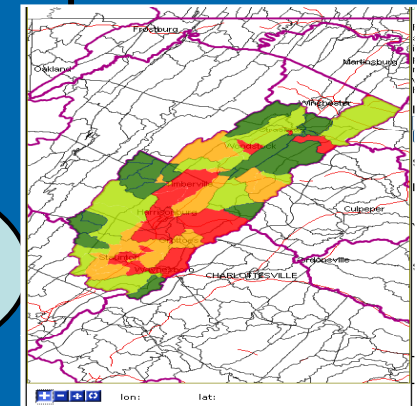
Some watersheds in Pennsylvania will be designated as high priority watersheds in this initiative because they have high yields of nitrogen and phosphorus, intense agricultural operations, and local water quality impairments due to excess nutrients or dissolved oxygen.

Applications from the designated priority watersheds will receive additional points in the ranking system due to their higher potential for environmental benefit in reducing sediment and nutrient loads before they reach the Bay.

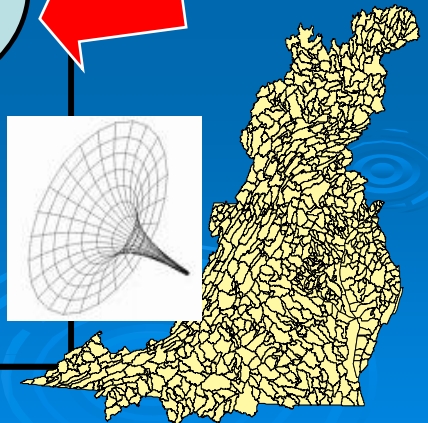
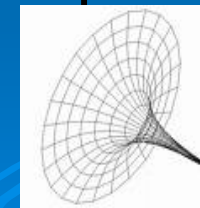
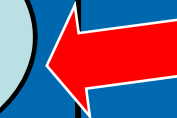
# COAST and Adaptive Management



You are Here



We are heading here, here, & here.







**Mark Dubin**  
**Agricultural Technical Coordinator**

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University of Maryland  
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