Harris Creek Case Study: Oyster Restoration and GIT Collaboration

Chesapeake Bay Program
Management Board

August 2, 2012

Peyton Robertson

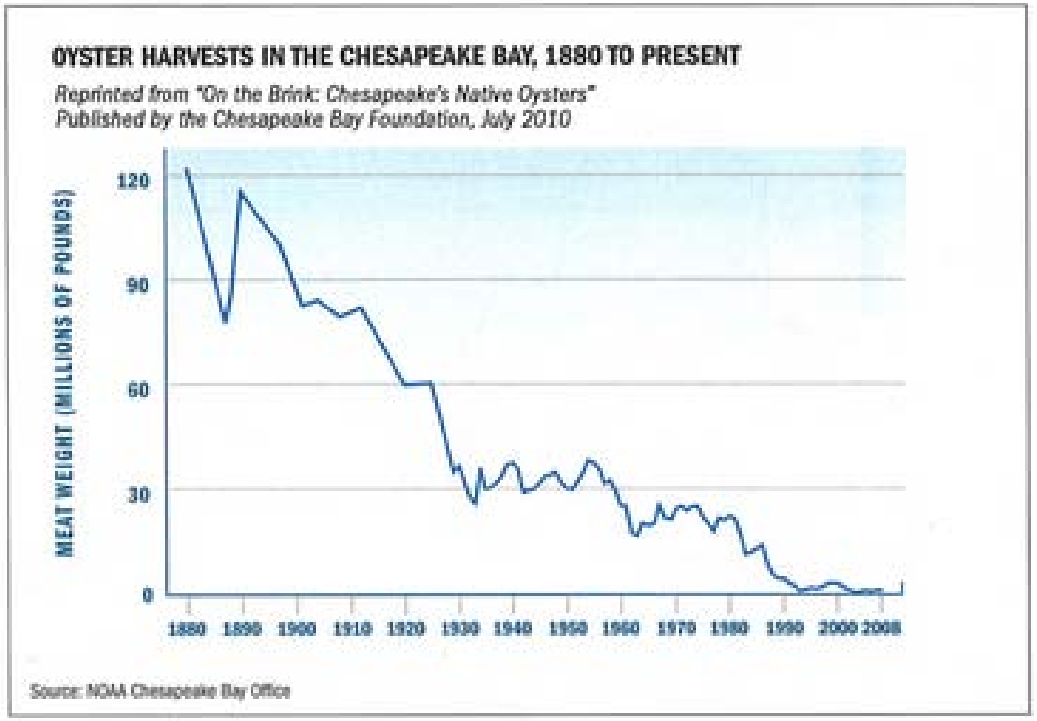
Fisheries Goal Team Chair

Outline

- Oyster Goal
- Factors Affecting Restoration Success
- Bay-Wide and Tributary-Specific Management Strategies
- Draft Harris Creek Tributary Plan/Blueprint
- GIT Collaboration

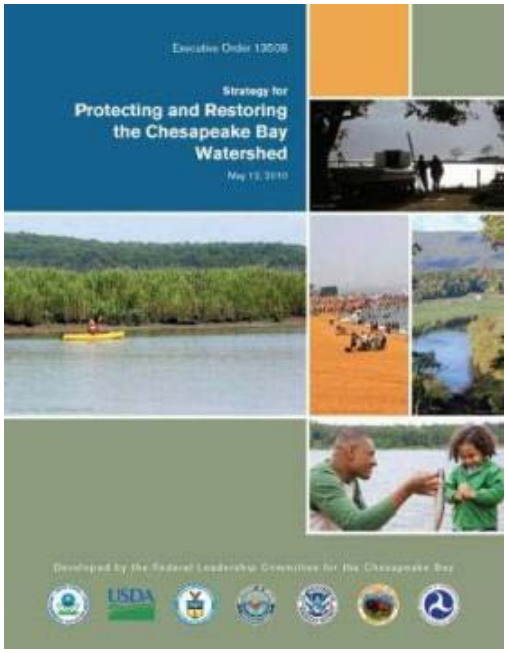
State of Oysters in the Bay

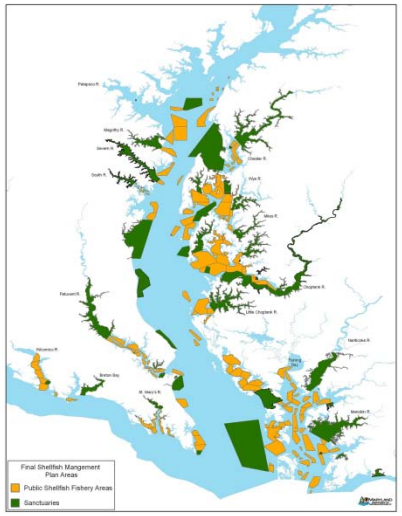
- Decimated Population
  - less than 1% of historical abundance (due to overfishing, habitat degradation, and disease)
- Keystone species
  - Water Quality
  - Habitat
- Economic and Heritage Value



Goal

- Restore native oyster habitat and populations in 20 tributaries by 2025 (EO 13508)
- Metrics for this goal
  1. 50-100% of restorable bottom in a tributary restored
  2. 50 oysters/m^2 covering at least 30% of the reef area
  3. At least two year classes present





Factors Affecting Restoration Success

- Habitat limitation
- Disease
- Poaching
- Water Quality (DO, nutrients, salinity, sediment)
  - USACE Master Plan Parameters
- Land Use
- Regulatory Processes
  - Permitting

Bay-Wide Oyster Restoration Management Strategy

- Strengthened Federal Partnerships
- Coordinated Federal/State Planning
- Roadmap for Sustainable Fisheries GIT
  - Targeted Large-Scale Ecological Restoration
  - Enforcement
  - Aquaculture
- Inter-GIT collaboration!

University of Maryland
Center for Environmental Science

William & Mary
VIMS
Virginia Institute of Marine Science
School of Marine Science

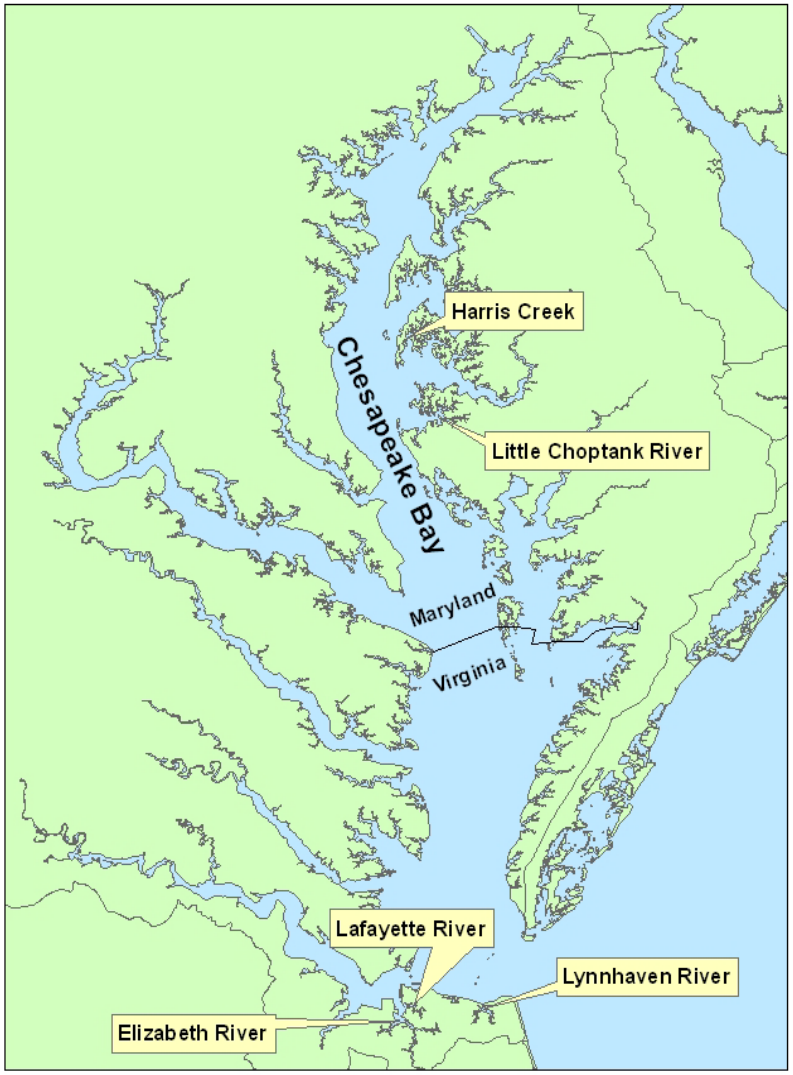
Oyster Recovery Partnership
ORP

Chesapeake Bay Foundation
Saving a National Treasure

Virginia Marine Resources Commission

Where We Are Now

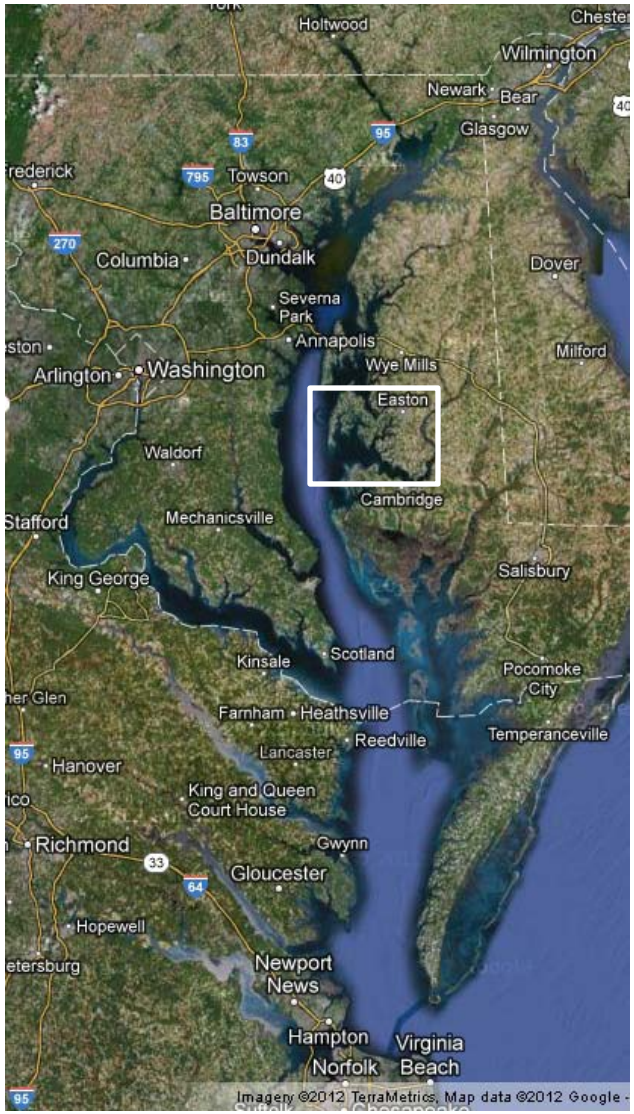
- Priority Tributary selection based on:
  - USACE Master Plan
  - MD Sanctuary Plan
  - Jurisdictional Priorities
- Areas most likely to succeed!
- 5 chosen to date

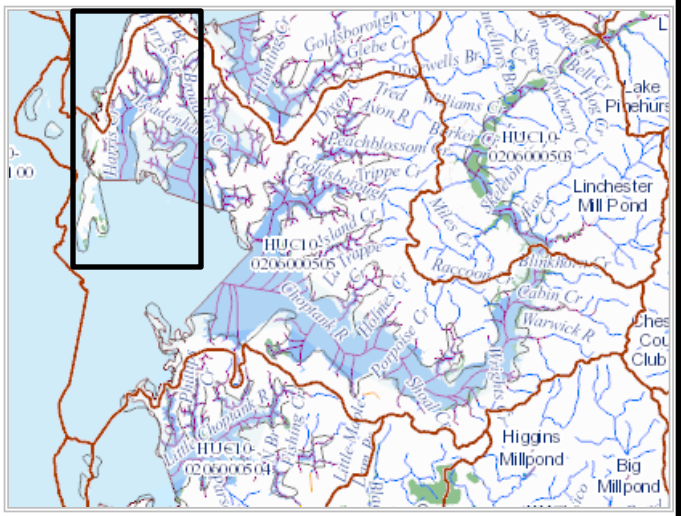


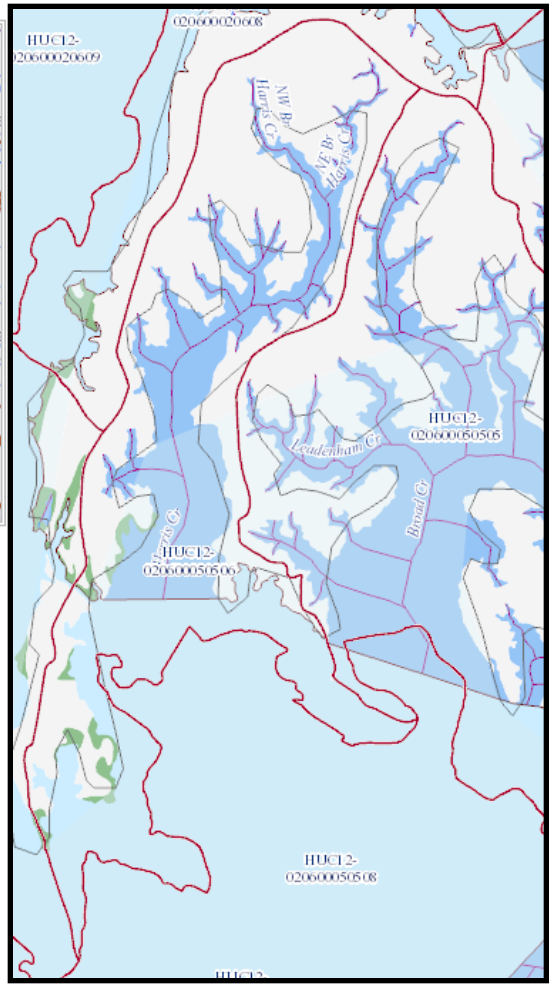
Harris Creek Management Strategy for Large-Scale Restoration

- Select Tributary
- Collect Environmental Data
- Draft Tributary Plan/Blueprint
  - Identify Sites and Types of Reef Treatment
  - Coordinate with Stakeholders
  - Finalize Tributary Plan
- Construct Reefs/Plant Spat-on-Shell
- Monitor and Evaluate per Oyster Metrics
- Adaptively Manage

Harris Creek



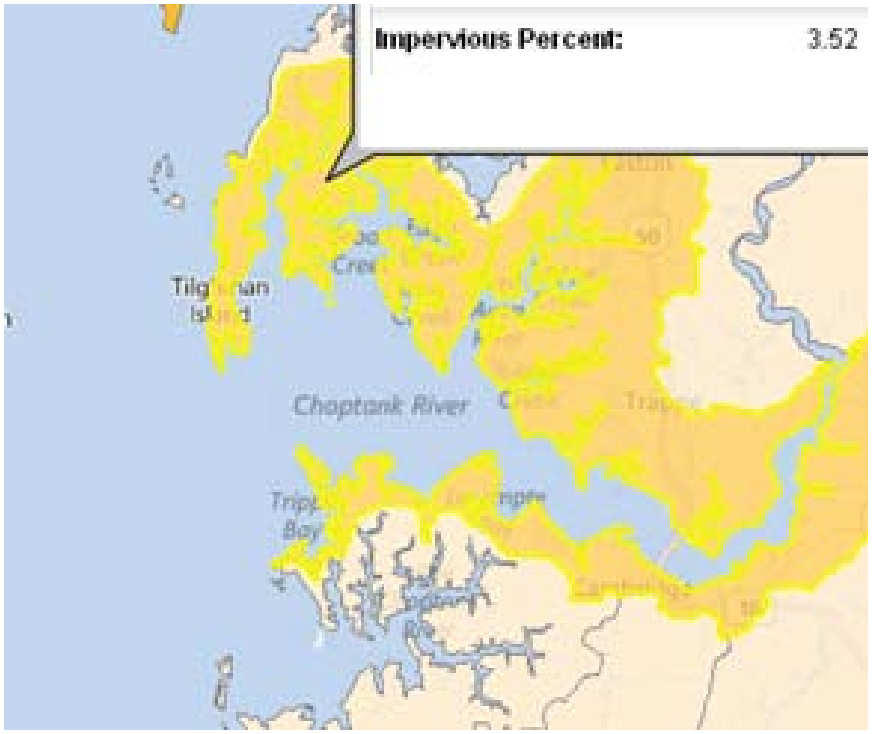


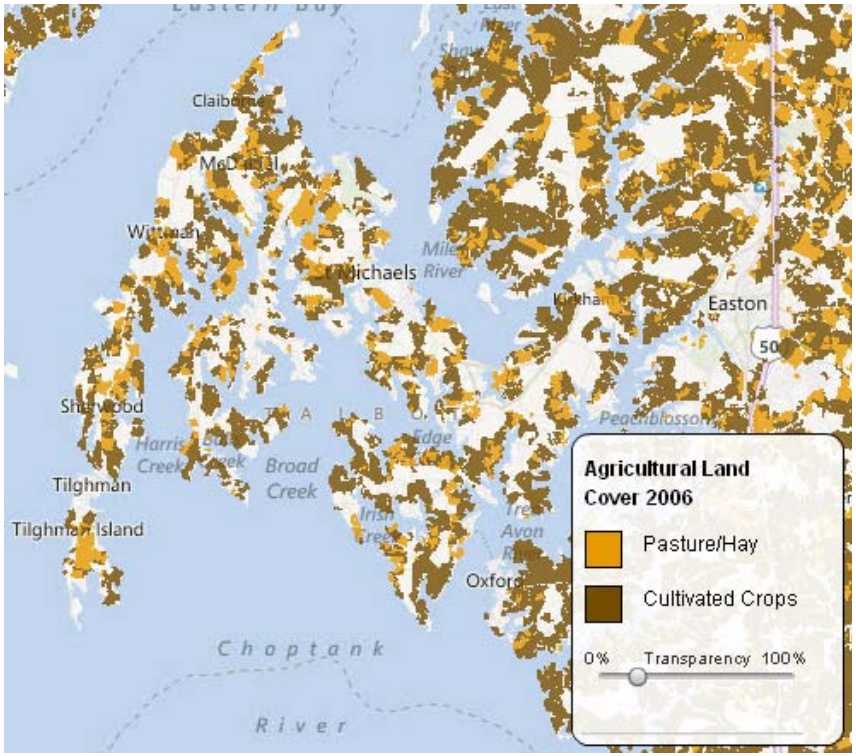


USGS The National Map NHD

Harris Creek

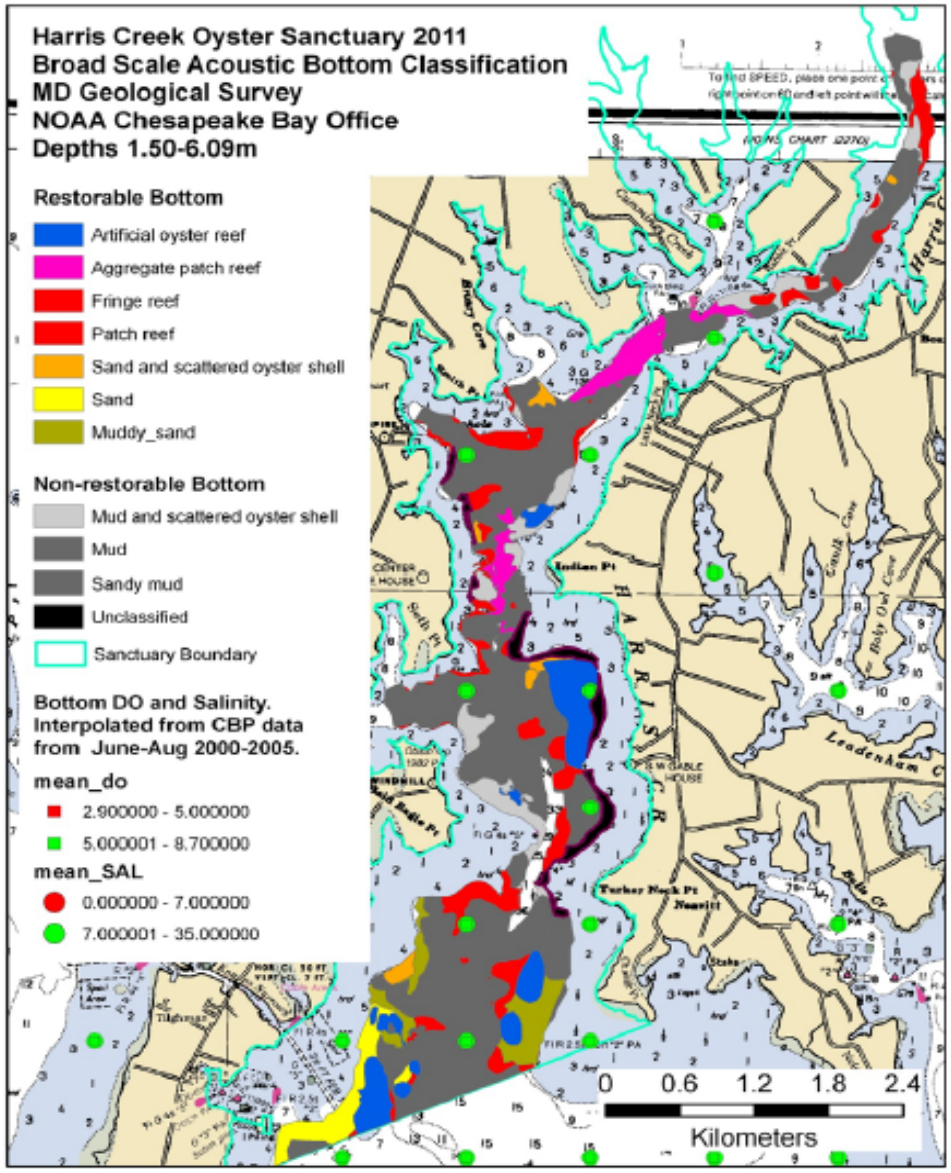
- Impervious surface
  - Below 10% Threshold
- Land Use
  - Mostly Agricultural





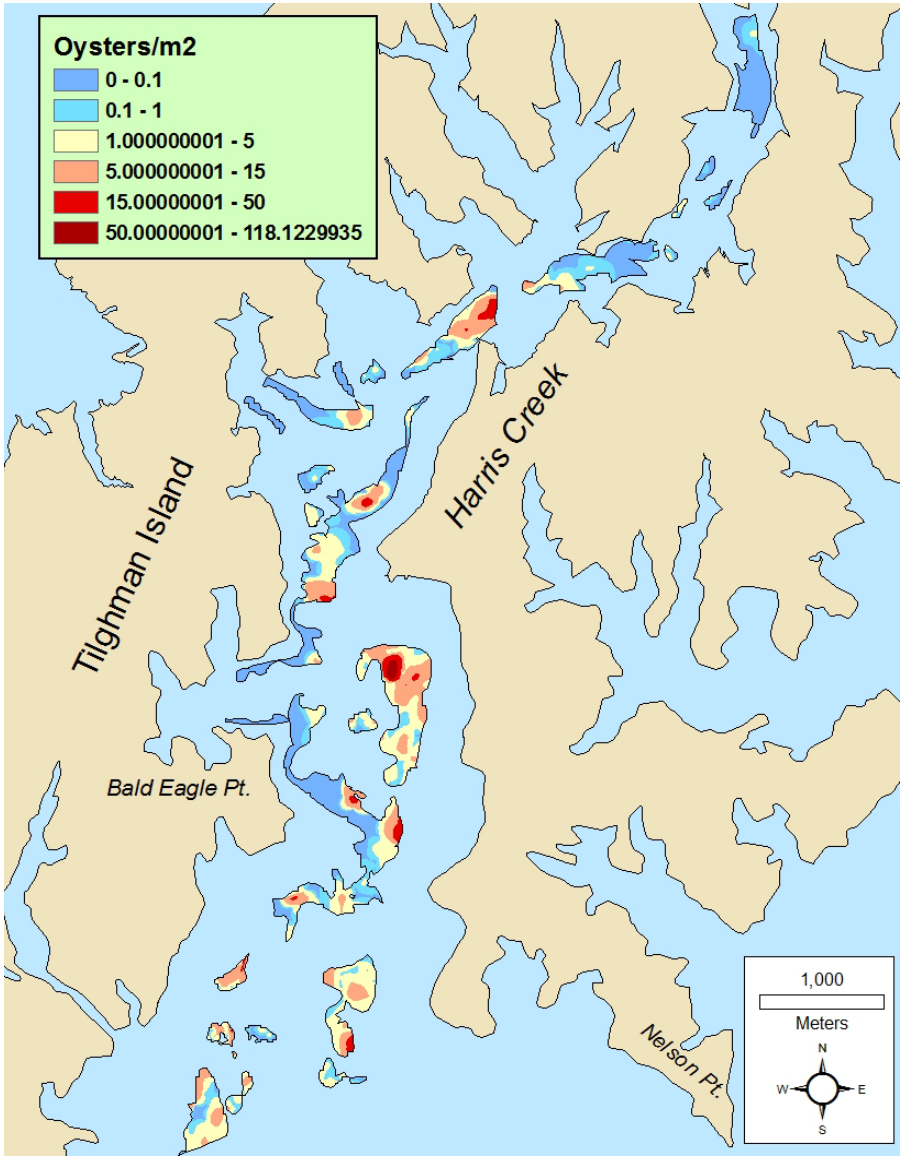
Draft Harris Creek Tributary Plan/Blueprint

- Restorable Bottom
  - 600 total acres
  - Need to restore 300-600 per the metrics
  - Target: 360 acres



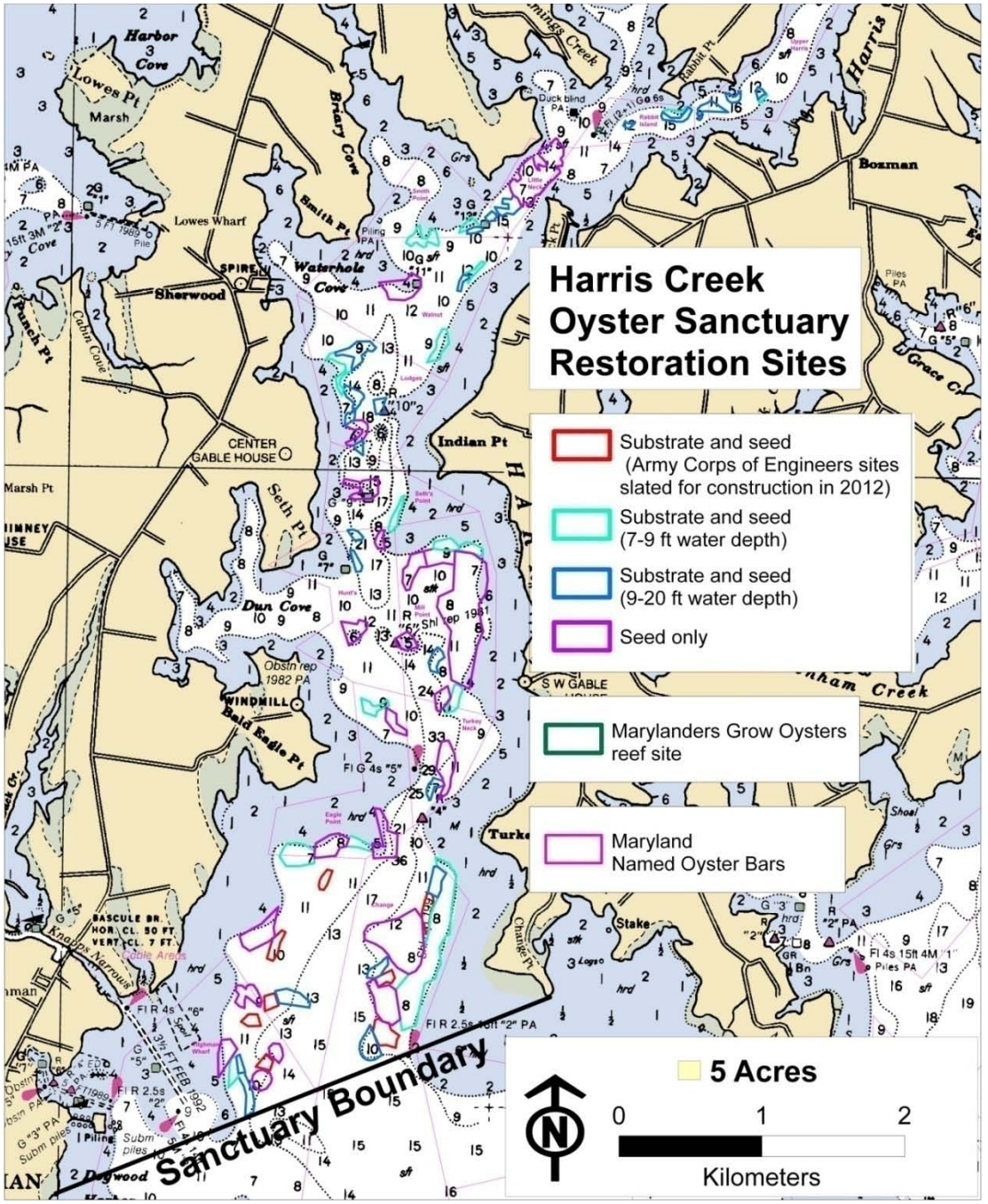
Draft Harris Creek Tributary Plan/Blueprint

- Oyster Population Assessment
  - We want to avoid covering or disturbing living oysters
  - Target: 50 oysters/m^2



Draft Harris Creek Tributary Plan/Blueprint

- Target: 360 Acres restored
- Preliminary Cost: $27 million
- 22 acres of substrate placed this summer
- 300 million spat-on-shell planted this summer



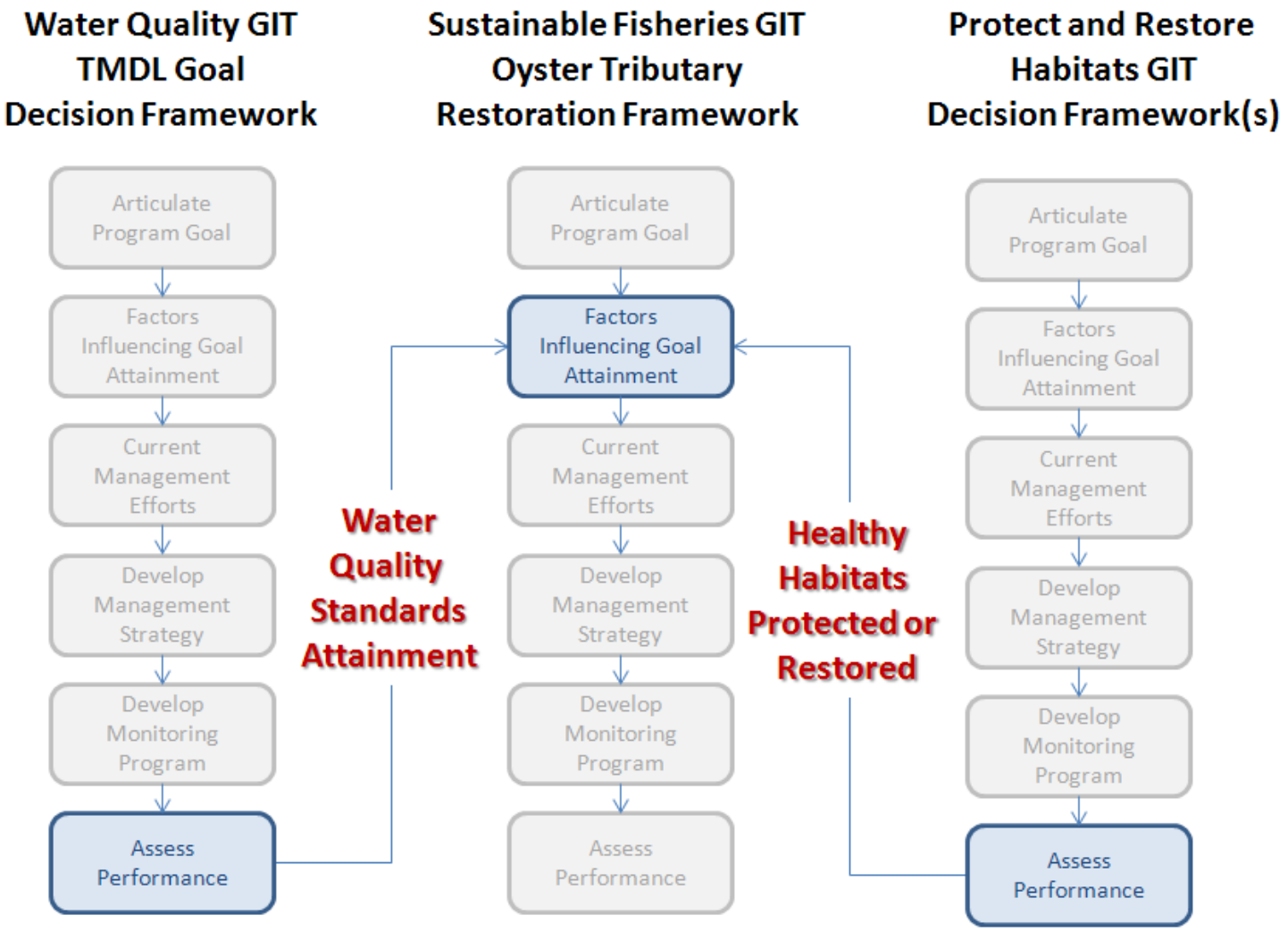
Managing Risk and Enhancing Restoration

- What can other GITs do to support this effort and protect our investment?
  - Maintain or improve water quality
  - Enhance wetlands and shoreline health
  - Protect watershed health
  - Education/Public Access

Chesapeake Bay Program

A Watershed Partnership

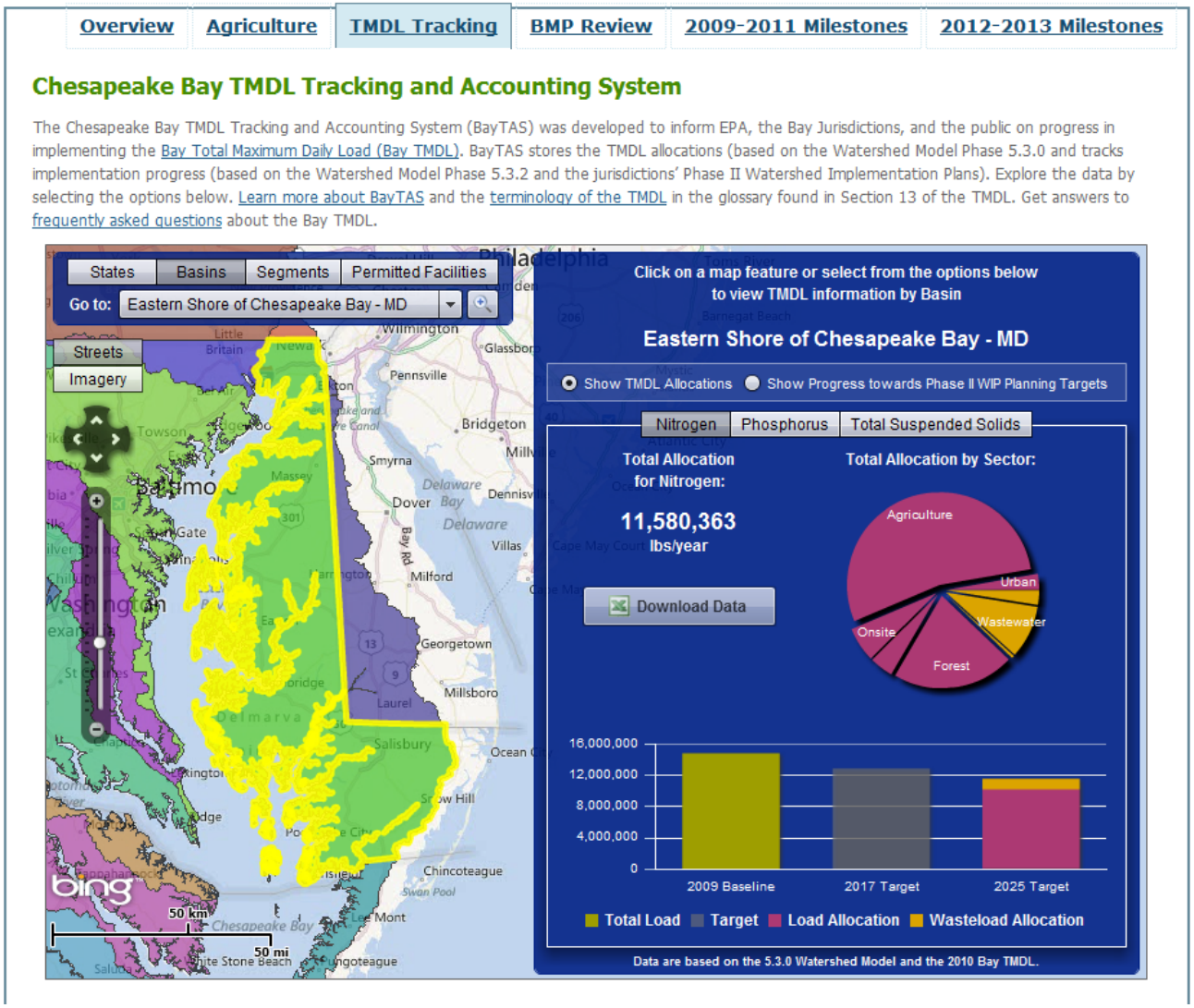
GIT Decision Framework Coordination



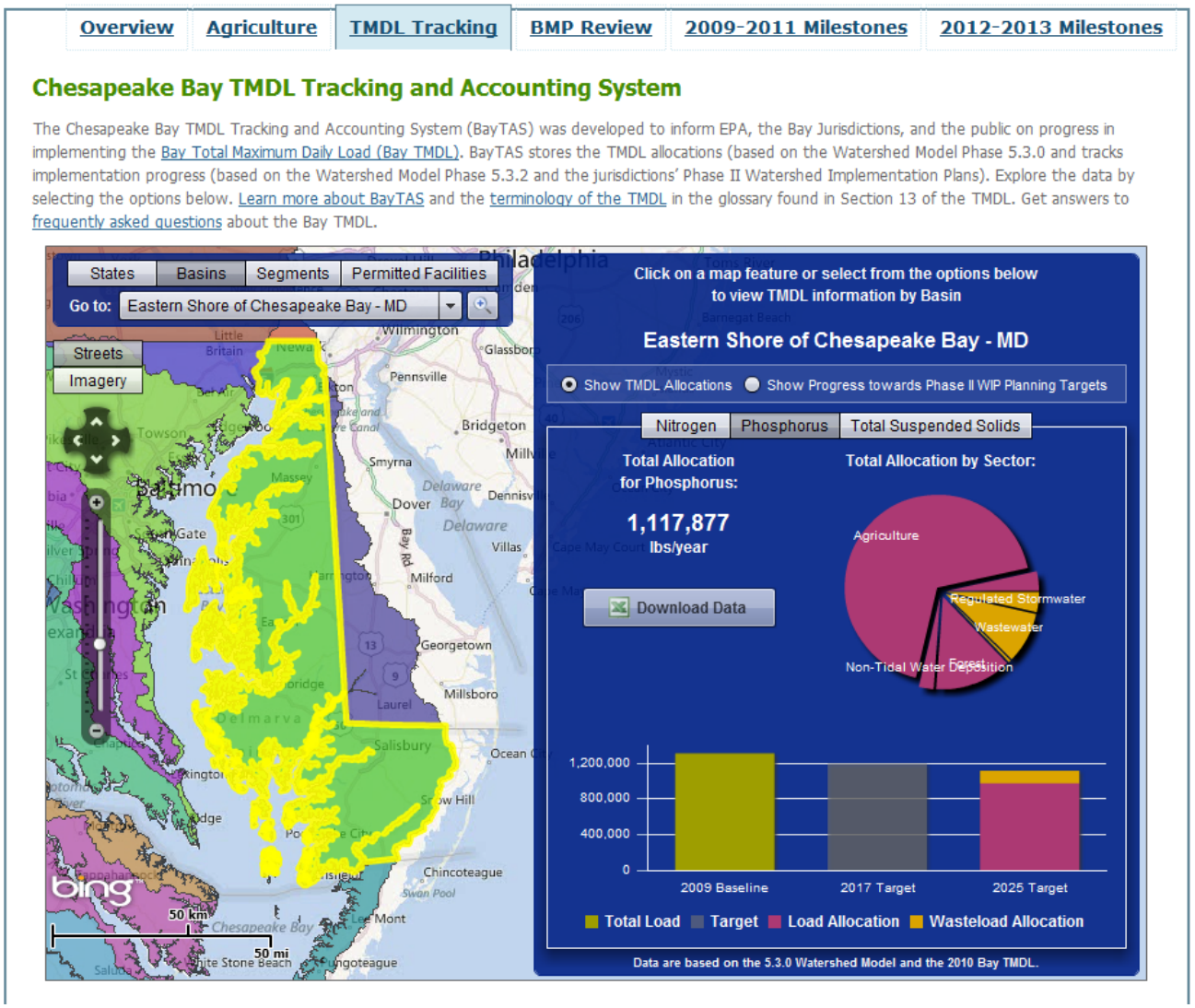
Water Quality (GIT 3) Goals and Outcomes

- Supports the commitments of the CBP partnership to reduce nitrogen, phosphorus and sediment pollution in order to achieve water-quality standards in the tidal waters of the Chesapeake Bay and its tributaries for:
  - DO
  - SAV/Clarity
  - Chlorophyll-a
- Goal: have all practices in place by 2025 that are necessary to meet water quality standards
- Improved water quality will directly impact the success of the Harris Creek oyster restoration project by creating or maintaining conditions that support living resources.

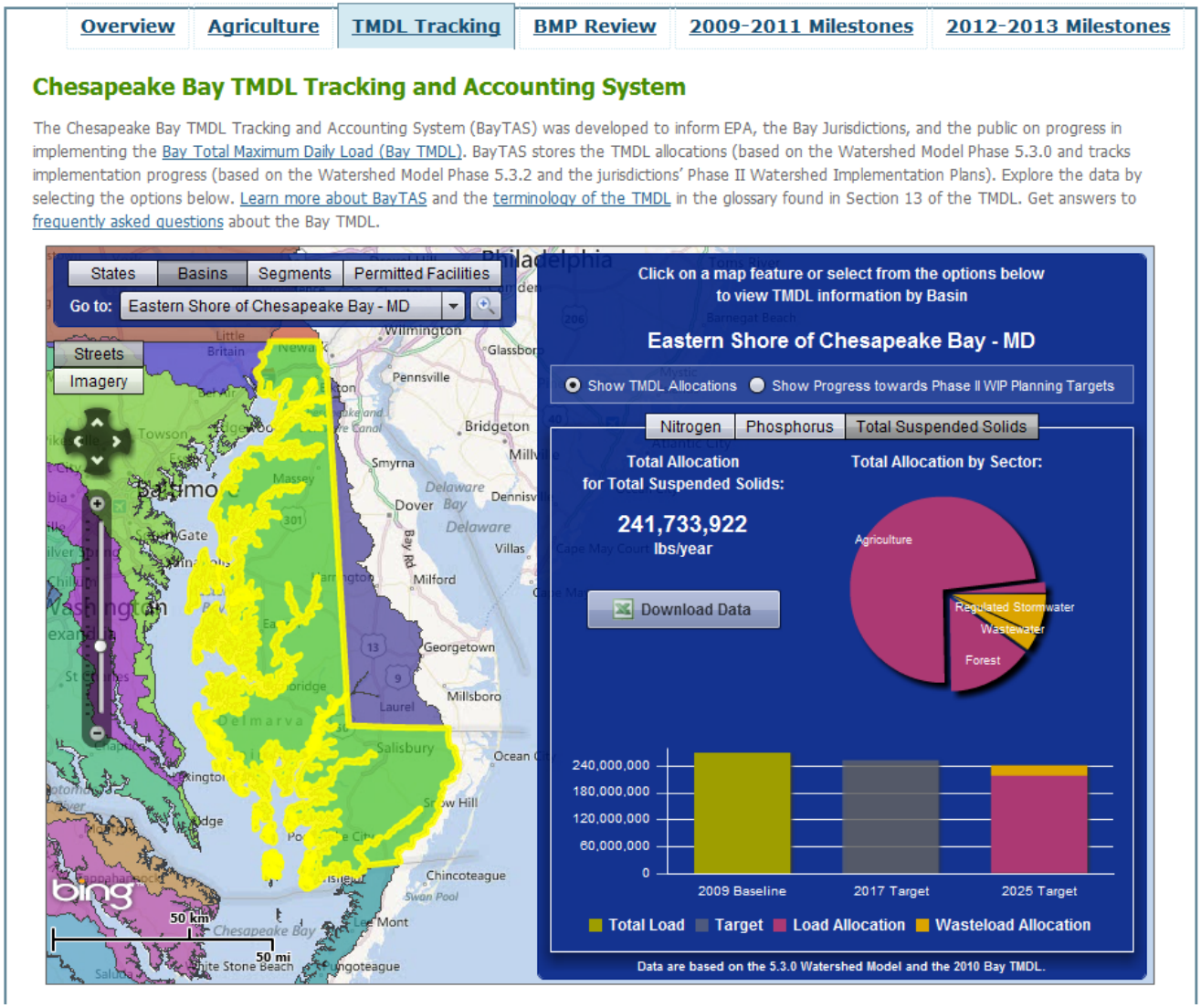
Nitrogen Sources and Chesapeake Bay TMDL Allocations for MD's Eastern Shore



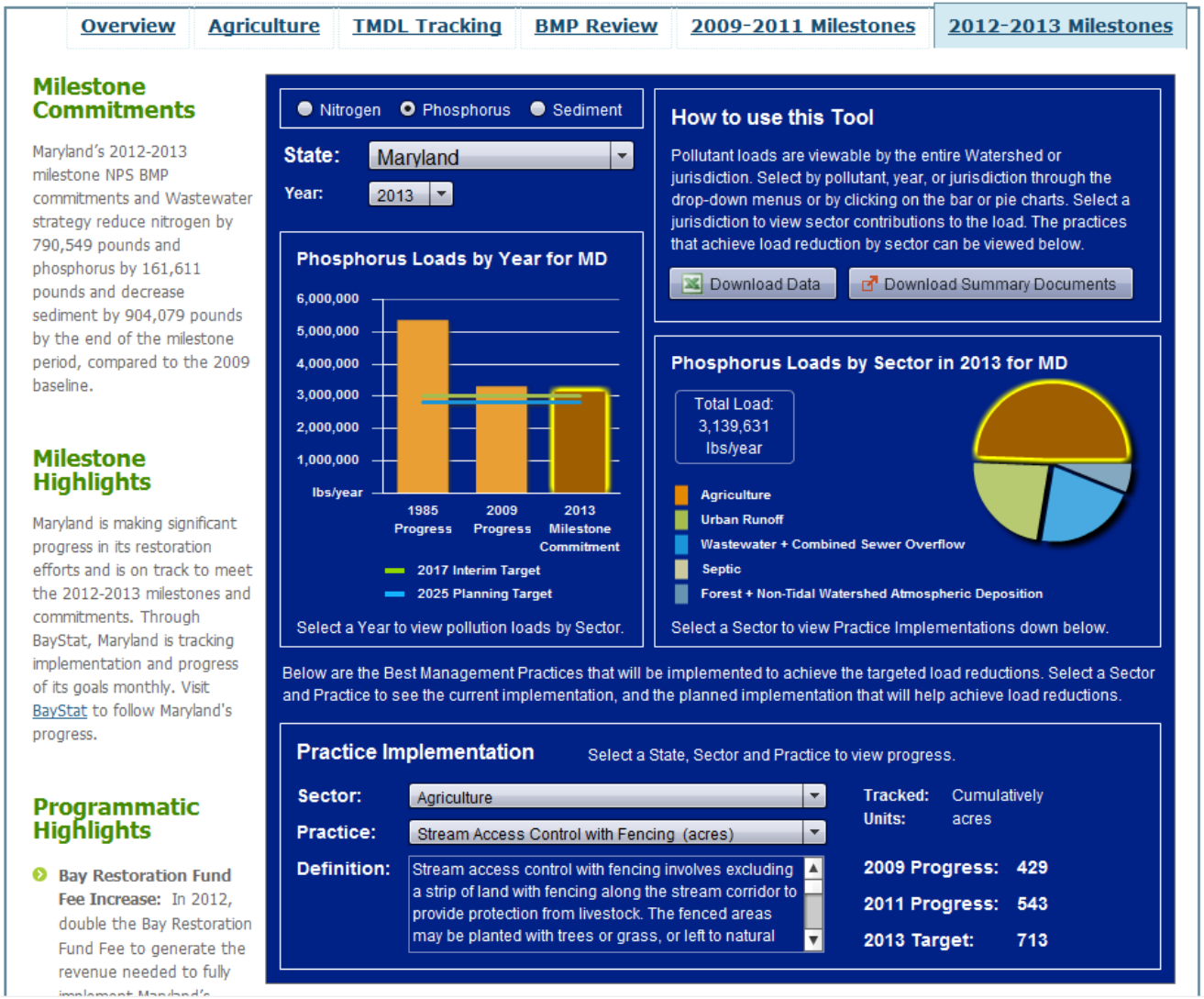
Phosphorus Sources and Chesapeake Bay TMDL Allocations for MD's Eastern Shore



Sediment Sources and Chesapeake Bay TMDL Allocations for MD's Eastern Shore



Track Information on State's Milestone Practice and Loading Commitments



Water Quality (GIT 3)

- ChesapeakeStat will be updated with Phase II WIP information in Fall 2012
- Maryland could use information to prioritize location and types of practices to most benefit oyster restoration in Harris Creek while still meeting TMDL and WIP goals

Habitat (GIT 2) Priorities

Submerged Aquatic Vegetation (Restore and Monitor)
Wetlands (Black Duck as biological outcome)
Stream Health (Brook Trout as biological outcome)
Fish Passage (River Herring, Shad, American Eel)

Harris Creek Evaluation completed through MD GreenPrint Data

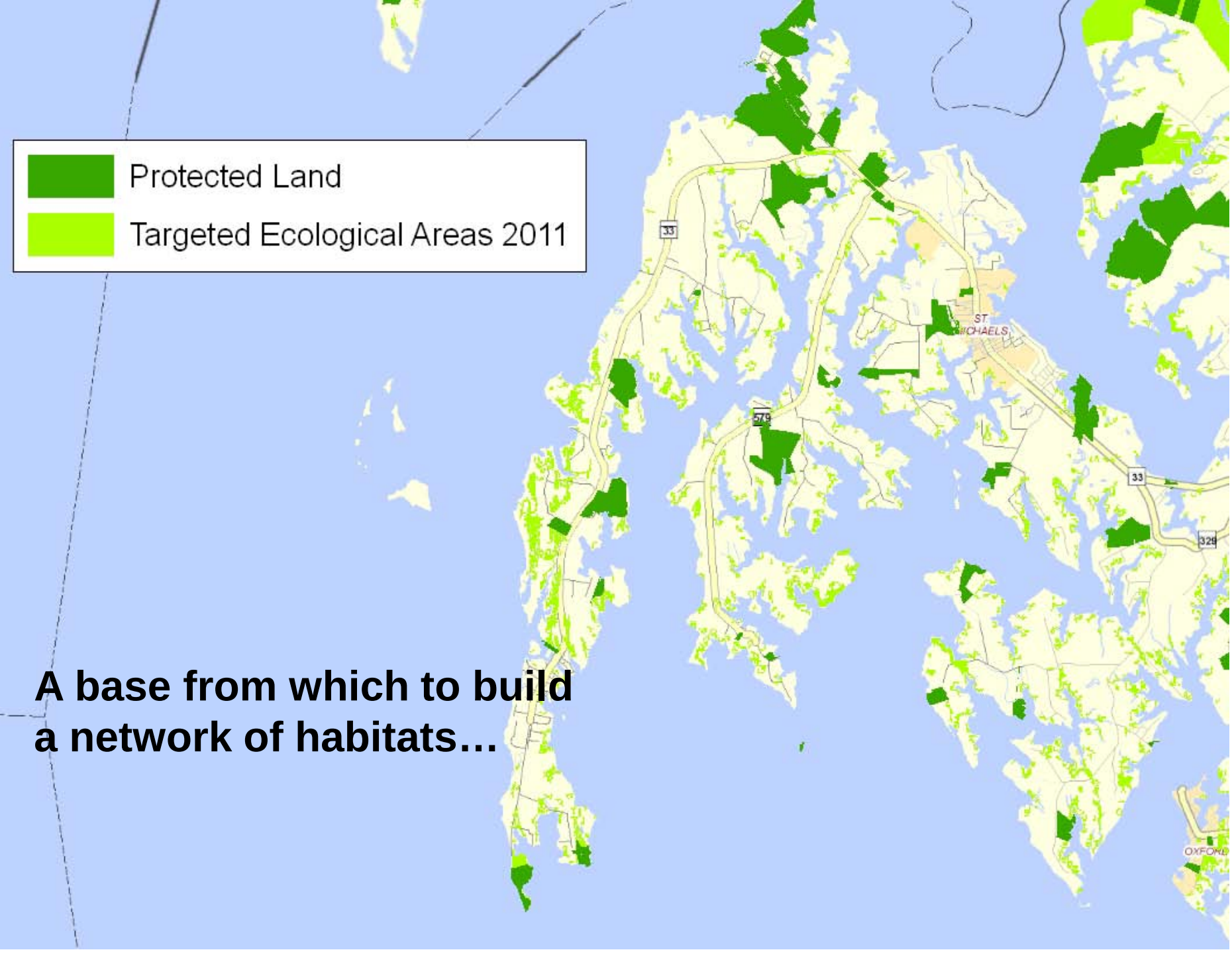
- **Targeted Ecological Areas**
- **Wildlife and Rare Species Habitats (BioNET)**
- **Tidal Fisheries, Bays and Coastal Ecosystems (Blue Infrastructure)**
- **Climate Change Wetland Adaptation Areas (sea level rise and erosion vulnerability)**
- **Wetland Restoration Opportunities (EPA/SHA Watershed Resources Registry)**

Moderately developed and predicted to remain relatively rural in character
(Plan MD and comp plan maps)

At 6% impervious, exceeds 5% threshold for protecting tidal finfish communities
but within the 5-10% impervious range for restoration targeting

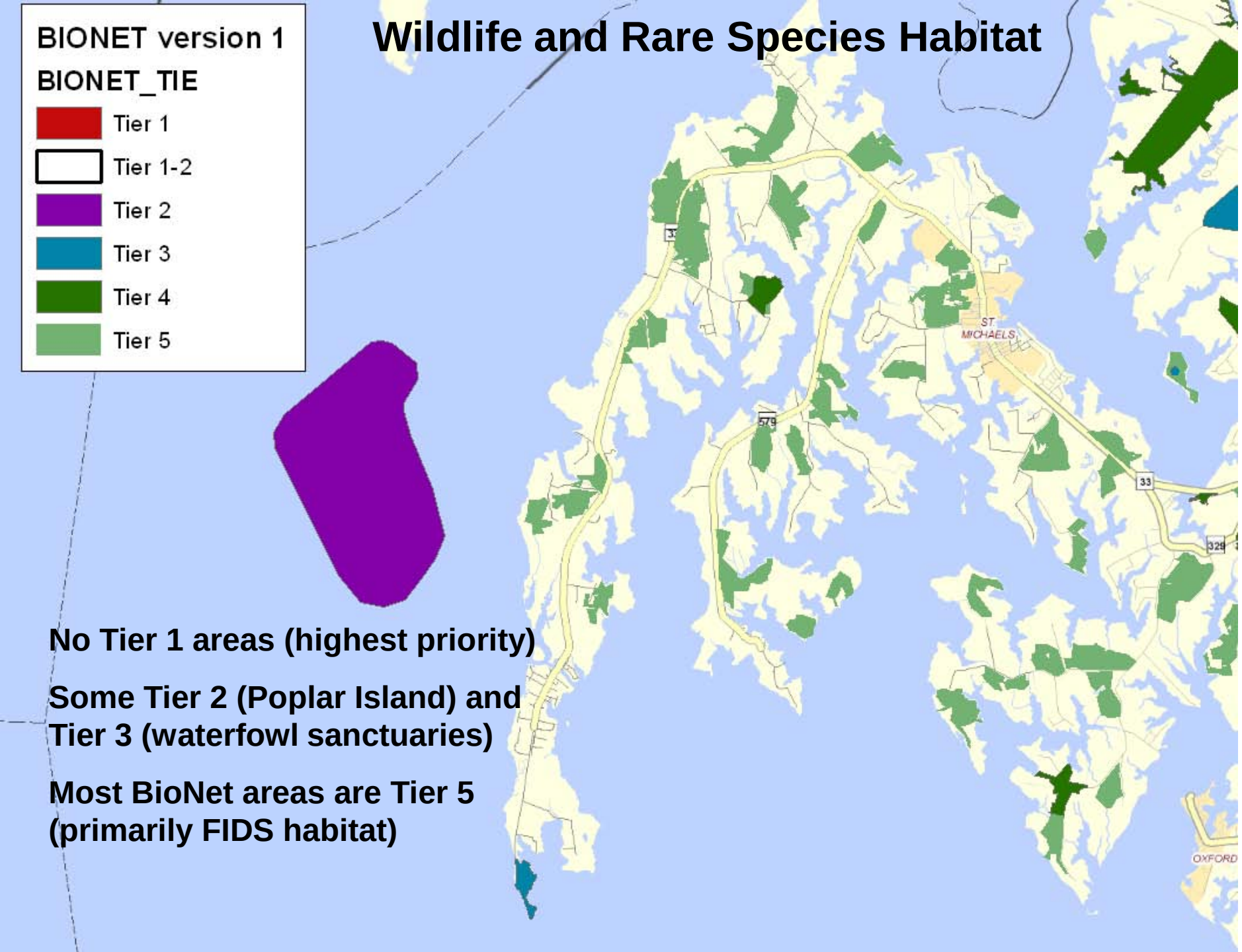
No highly ranked productive fisheries in watershed, however likely a productive striped bass and blue crab nursery area

Watershed, and broader peninsula are important waterfowl habitat areas



A base from which to build a network of habitats…

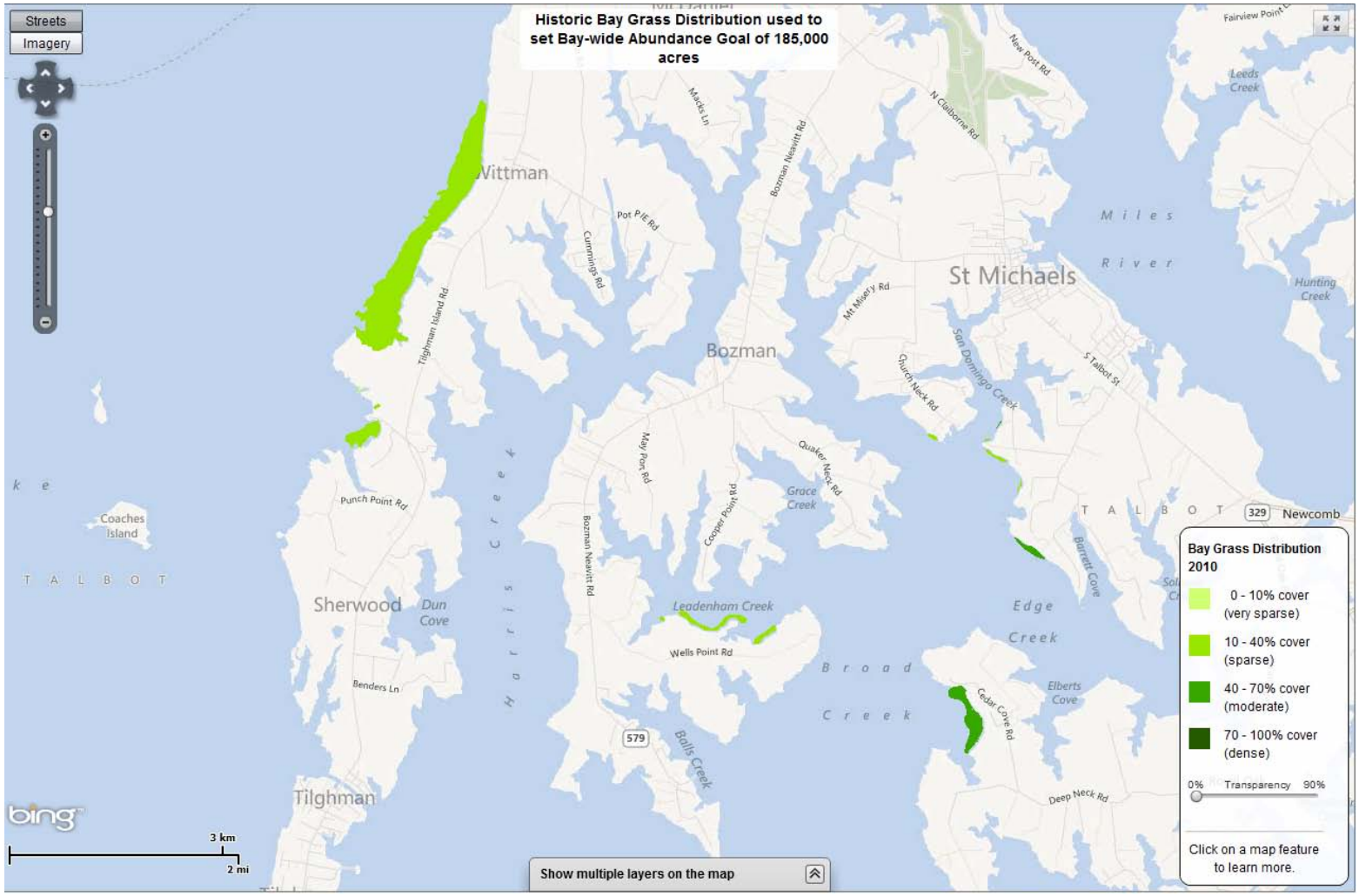
Wildlife and Rare Species Habitat



No Tier 1 areas (highest priority)

Some Tier 2 (Poplar Island) and Tier 3 (waterfowl sanctuaries)

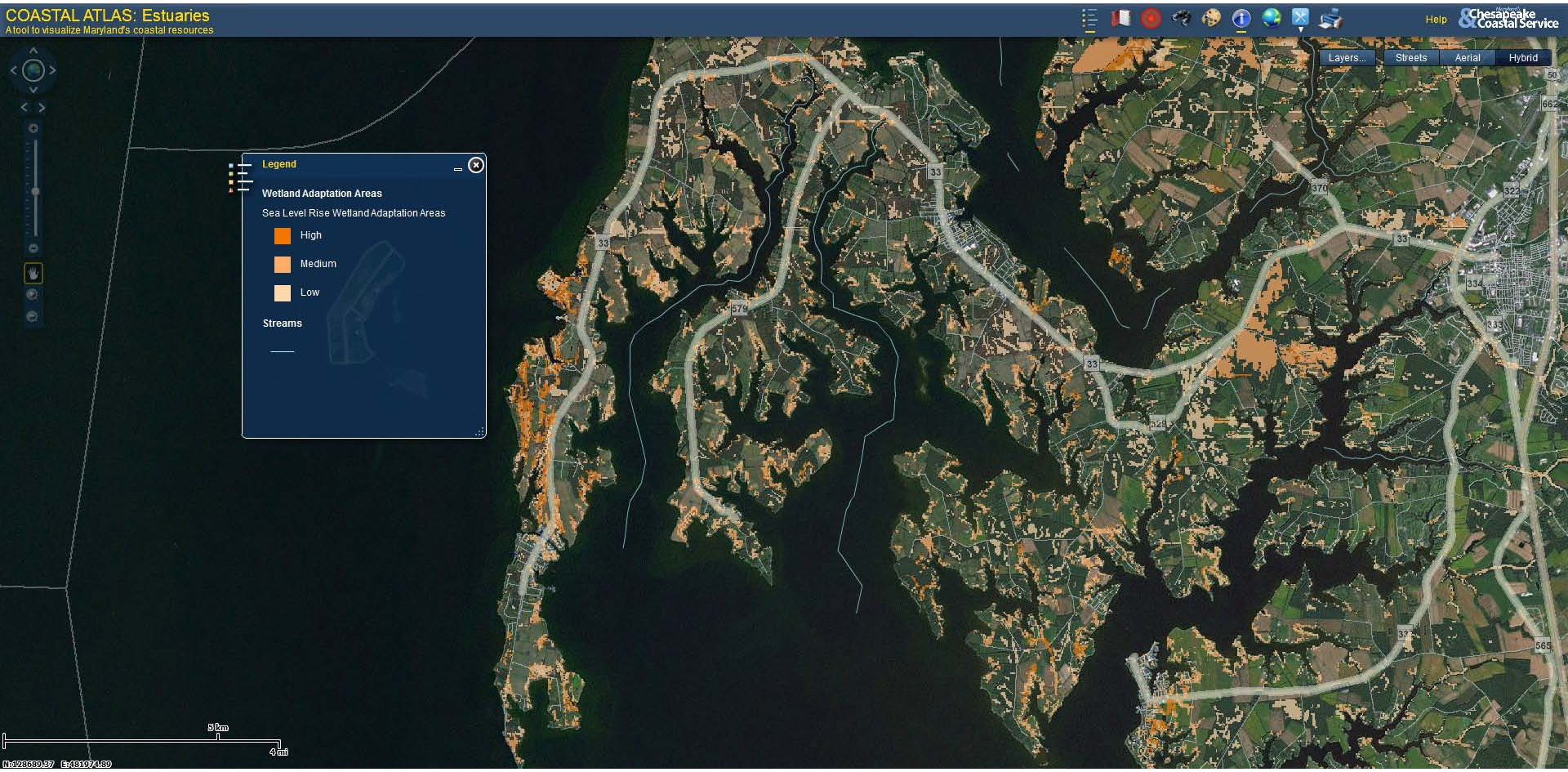
Most BioNet areas are Tier 5 (primarily FIDS habitat)


Historic Bay Grass Distribution used to set Bay-wide Abundance Goal of 185,000 acres
Streets
Imagery
Bay Grass Distribution 2010
0 - 10% cover (very sparse)
10 - 40% cover (sparse)
40 - 70% cover (moderate)
70 - 100% cover (dense)
0% Transparency 90%
Click on a map feature to learn more.
Show multiple layers on the map
Wittman
Bozman
St Michaels
Sherwood
Tilghman
Miles River
Harris Creek
Broad Creek
Edge Creek
Leadenham Creek
Grace Creek
Balls Creek
Dun Cove
Barrett Cove
Elberts Cove
Coaches Island
Hunting Creek
Leeds Creek
Newcomb
TALBOT
329
579
Tilghman Island Rd
Punch Point Rd
Benders Ln
Cummings Rd
Pot P/E Rd
Macks Ln
Bozman Neavitt Rd
May Port Rd
Cooper Point Rd
Quaker Neck Rd
Wells Point Rd
Mt Misery Rd
Church Neck Rd
San Domingo Creek
S Talbot St
N Claiborne Rd
New Post Rd
Fairview Point
Cedar Cove Rd
Deep Neck Rd
3 km
2 mi
bing

Shoreline Habitat

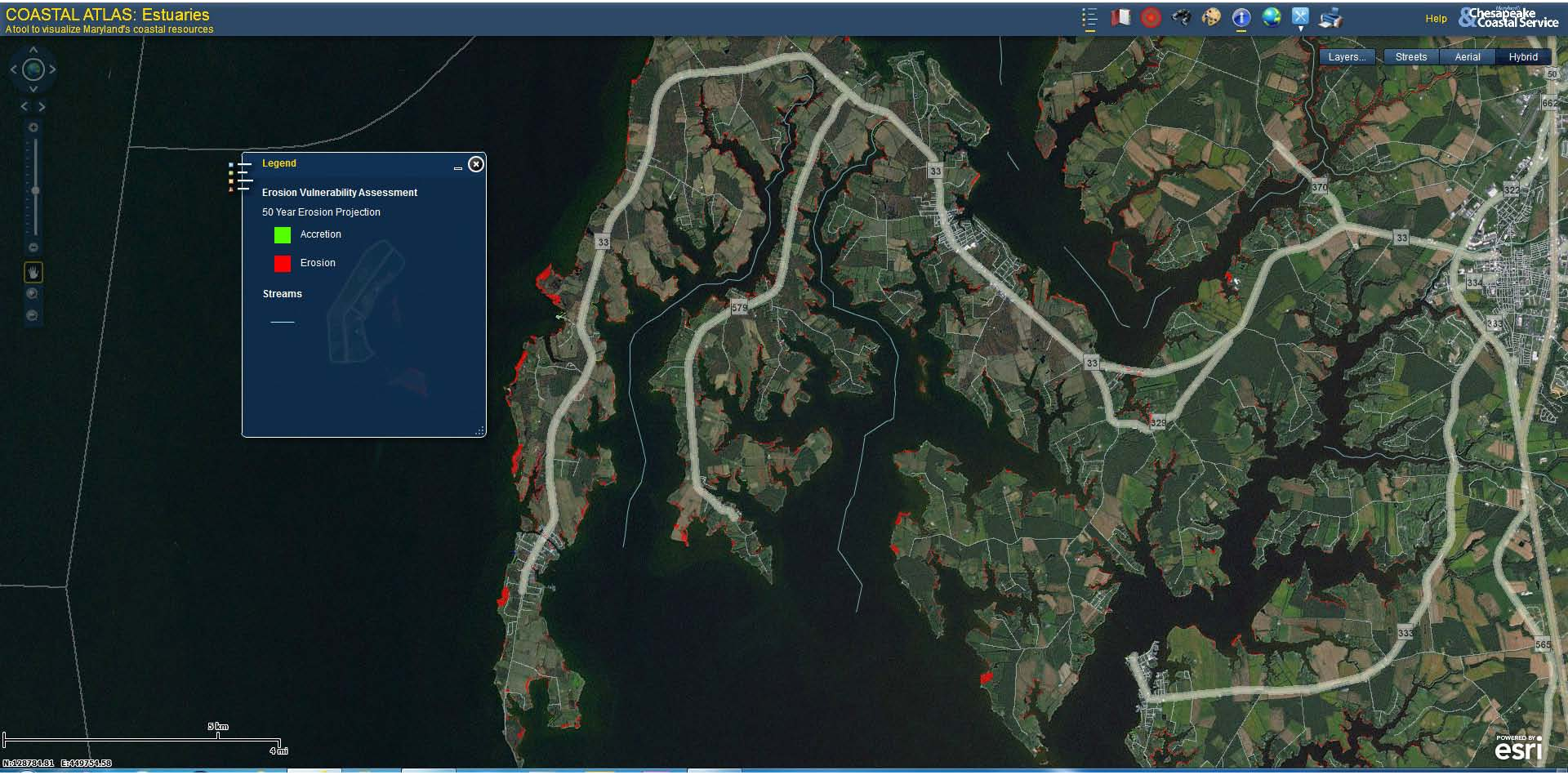
Blue Infrastructure Assessment shows no high priority shoreline segments in the Harris Creek watershed.

Climate Change Wetland Adaptation Areas

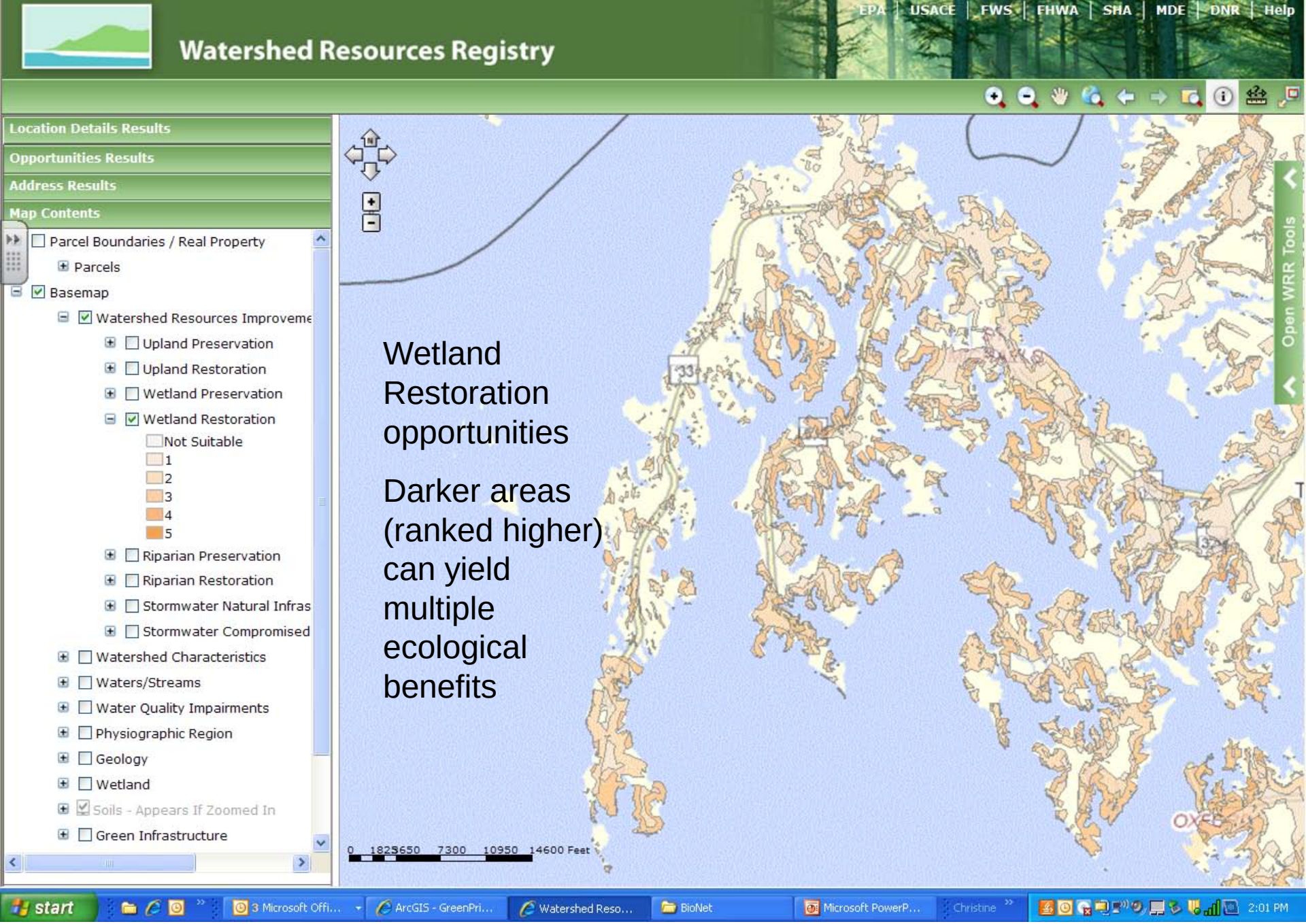


Areas ranked as High (darker orange) have higher priorities for conservation and management to allow for marsh migration

Erosion Vulnerability Assessment



Red areas show where erosion is likely to occur in future

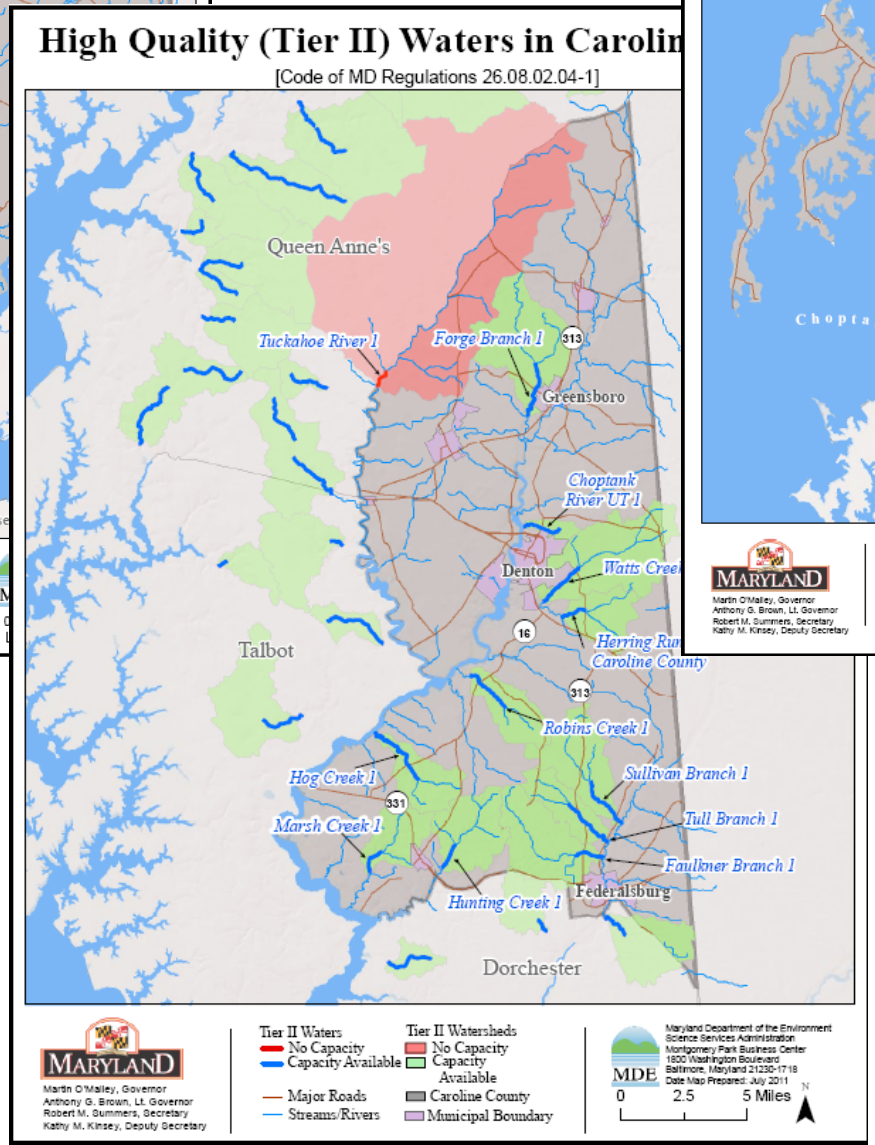

EPA | USACE | FWS | FHWA | SHA | MDE | DNR | Help
Watershed Resources Registry
Location Details Results
Opportunities Results
Address Results
Map Contents
Parcel Boundaries / Real Property
Parcels
Basemap
Watershed Resources Improveme
Upland Preservation
Upland Restoration
Wetland Preservation
Wetland Restoration
Not Suitable
1
2
3
4
5
Riparian Preservation
Riparian Restoration
Stormwater Natural Infras
Stormwater Compromised
Watershed Characteristics
Waters/Streams
Water Quality Impairments
Physiographic Region
Geology
Wetland
Soils - Appears If Zoomed In
Green Infrastructure
Wetland Restoration opportunities
Darker areas (ranked higher) can yield multiple ecological benefits
Open WRR Tools
0 1825650 7300 10950 14600 Feet
start
3 Microsoft Offi...
ArcGIS - GreenPri...
Watershed Reso...
BioNet
Microsoft PowerP...
Christine
2:01 PM

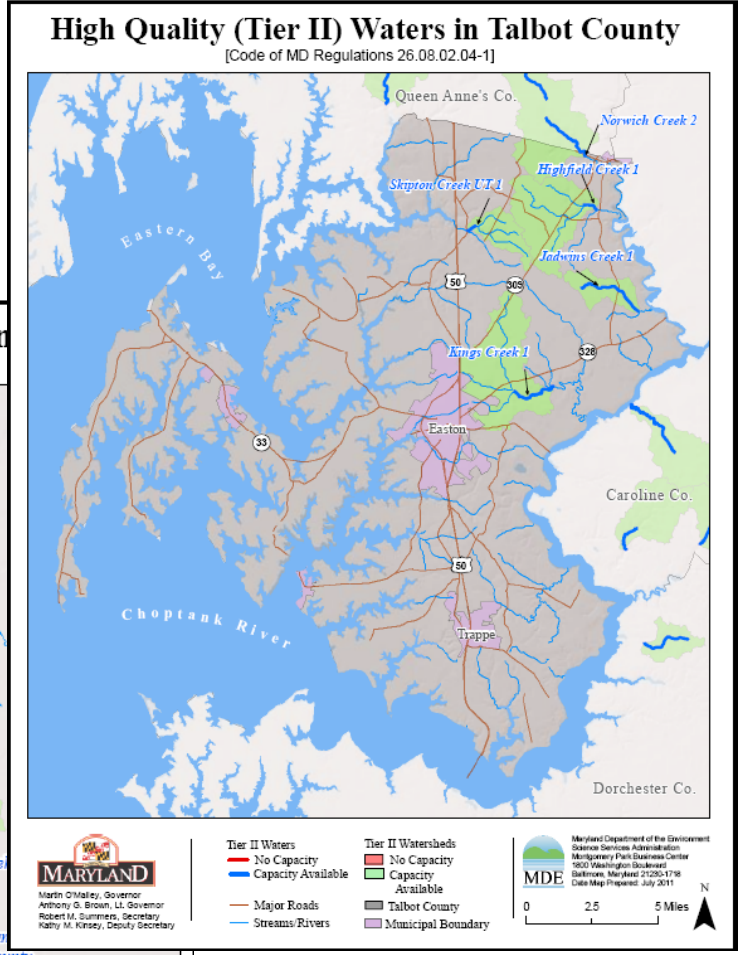
Healthy Watersheds (GIT 4) Potential Actions for Harris Creek

If modeling indicates that the Choptank Watershed is a significant driver of Harris Creek aquatic health, then:

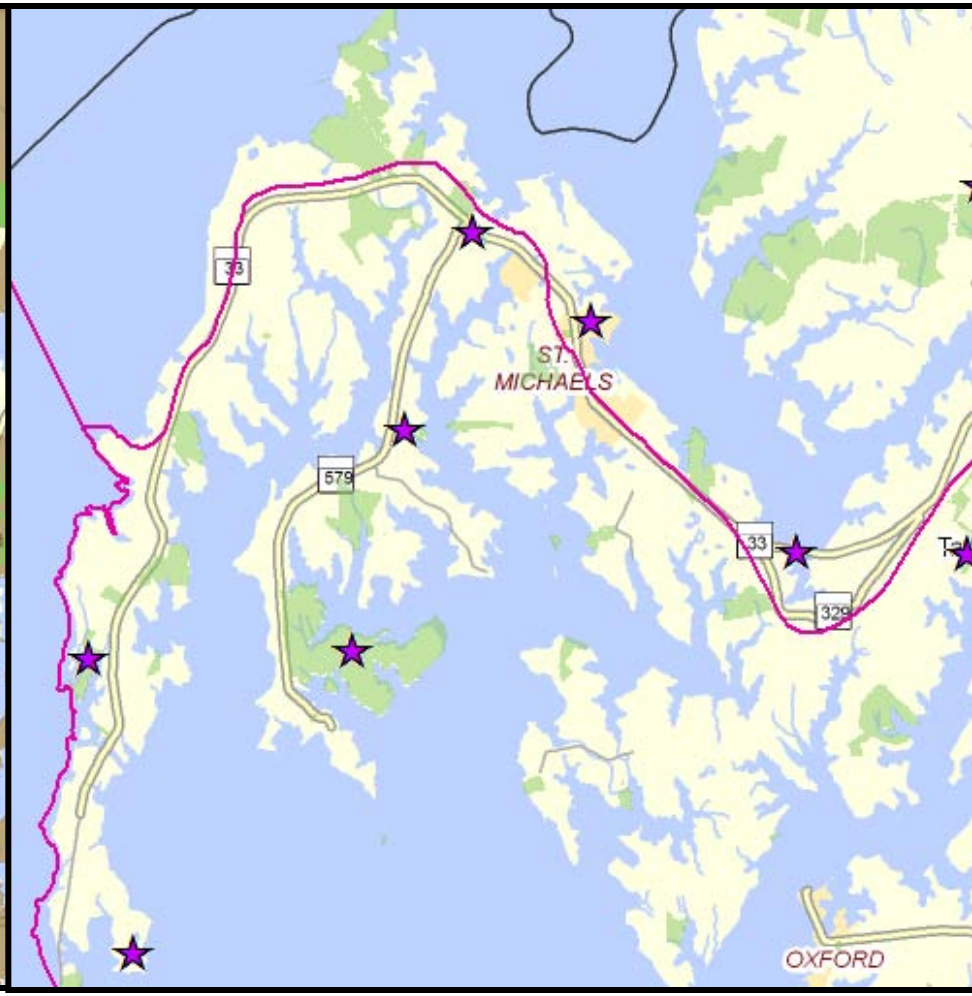
- Assess and Track Health, Threats, and Protection Status of State-identified Tier II Watersheds in the Choptank basin
- Encourage Anti-Degradation Policy Implementation in State-identified Tier II Watersheds in the Choptank basin

MD Tier II Watersheds





Citizen Stewardship (GIT 5) – Land Conservation



AGPRINT

- Permanently Preserved Agricultural Lands
- Other Protected Lands
- Targeted Agricultural Areas
- Military Lands

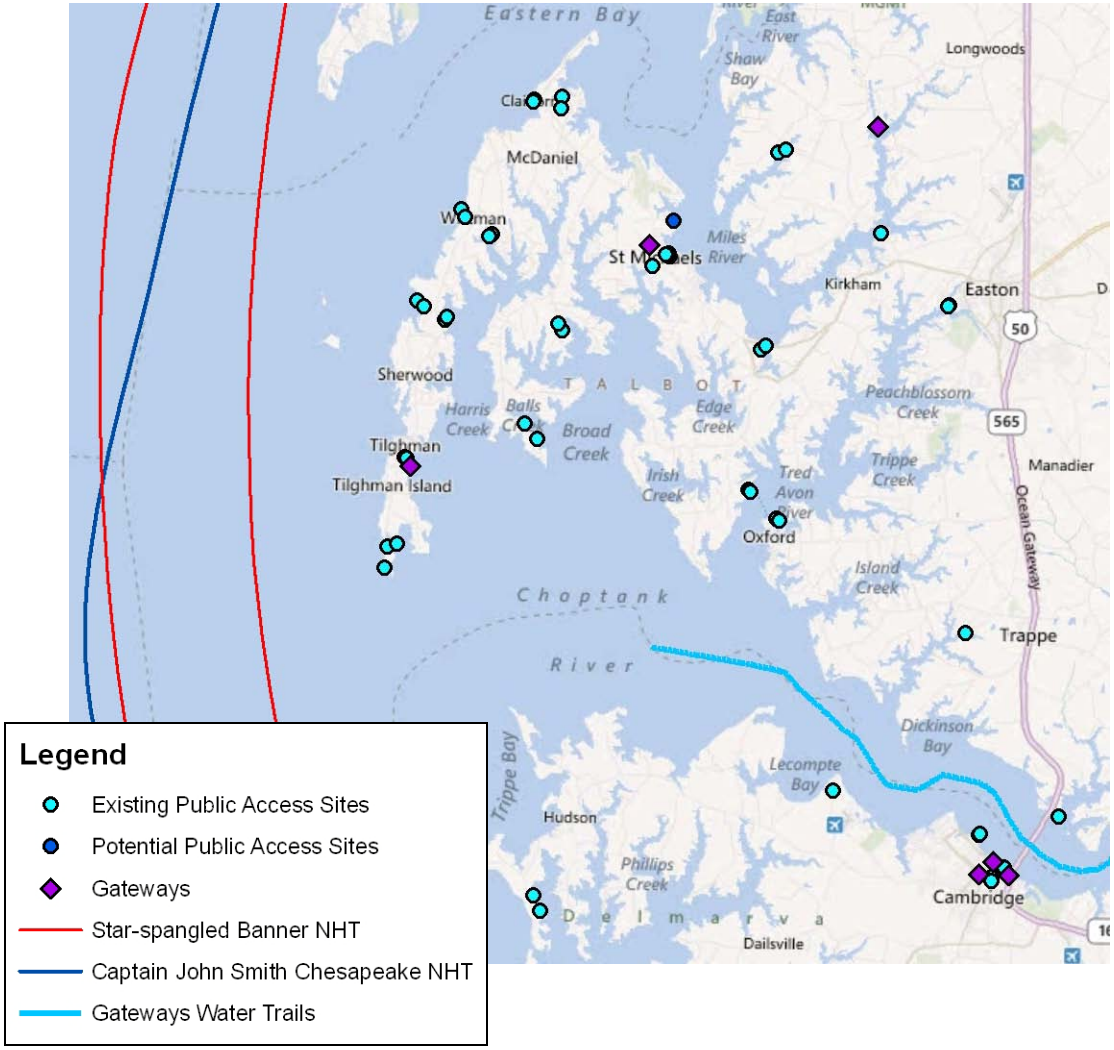
GREENPRINT

- Tributary Strategy Basins
- Acquisitions outside Targeted Ecological Areas
- All Protected Lands

Citizen Stewardship (GIT 5) – Land Conservation

- MD agencies have identified lands near Harris Creek that are priorities for protection due to their high ecological value
- These lands might be considered a higher priority for protection if this will further oyster restoration efforts.

Citizen Stewardship (GIT 5)– Public Access



- 6 public access sites currently exist on Harris Creek
  - 3 of these sites provide fishing access
  - 3 of these sites provide boating access
- No potential new sites were identified in the Public Access Plan

Citizen Stewardship (GIT 5) - Education

Oyster-related Meaningful Watershed Educational Experiences could be promoted in Talbot County

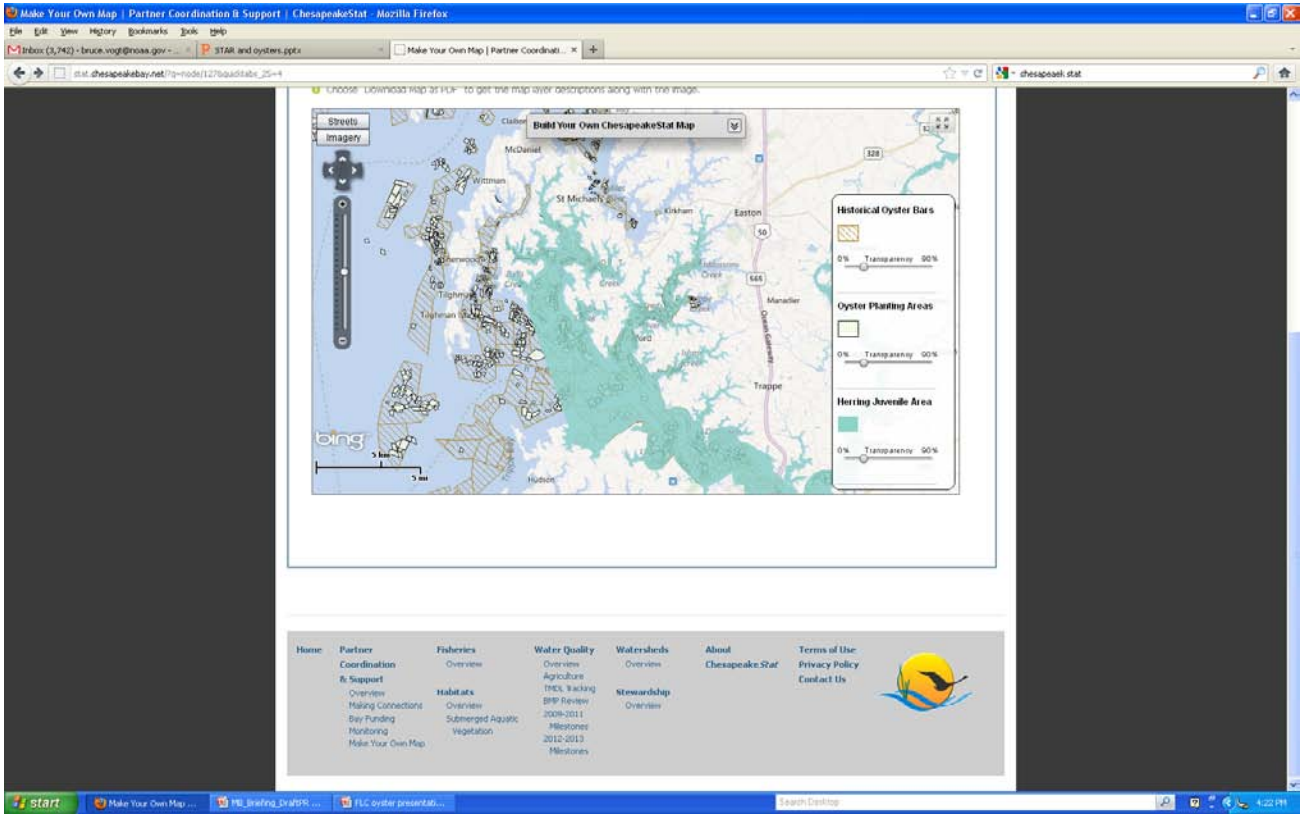
- Talbot County has 8 public schools
- Tilghman Elementary is located near Harris Creek
- 7 Field study providers
- NOAA's Environmental Science Training Center provides professional development for educators
- www.BayBackpack.com, our teacher resource website features oyster-related resources that could be utilized :
  - 22 teacher resources/lessons
  - 5 blog entries
  - 22 field study locations (watershed-wide)

Scientific, Technical Assessment and Reporting *(*STAR)

- Develop ecoservices assessment of restored oyster reef habitat (e.g., biofiltration, oyster larvae production, denitrification enhancement)
- Scale up to a Bay-wide oyster restoration assessment (e.g., would more oysters = more fish or more SAV?)
- Consider climate change implications on large scale oyster restoration (e.g., sea level rise, temperature, ocean acidity)

Chesapeake Stat

- Chesapeake Stat demo on data layers can be combined as a tool for selecting and assessing geographic focus areas



Questions to MB

- How can the Management Board actively support and foster cross-GIT collaboration and this ecosystem approach to protection and restoration?