CHESAPEAKE BAY COMPREHENSIVE WATER RESOURCES AND RESTORATION PLAN - UPDATE

Update to Chesapeake Bay Program STAR

January 25, 2018

"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

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RECAP – GOAL AND BACKGROUND

Provide a single, comprehensive and integrated restoration plan that would assist with implementation of the Chesapeake Bay Agreement.

- Effectively and efficiently engaging Bay stakeholders- adopt and align with others actions
- Avoid duplication of ongoing or planned actions by others
- Maximize use of existing information
- Determine where and how USACE mission areas could be utilized in the watershed to support Chesapeake Bay Agreement goals
- Identify actions for others to address problems outside of USACE mission areas
- Identify at least one project in each Bay jurisdiction that can be implemented by USACE to support the Bay Agreement

TECHNICAL APPROACH - DATA COLLECTION PROCESS

Around **170** data layers collected from different agencies and organizations.

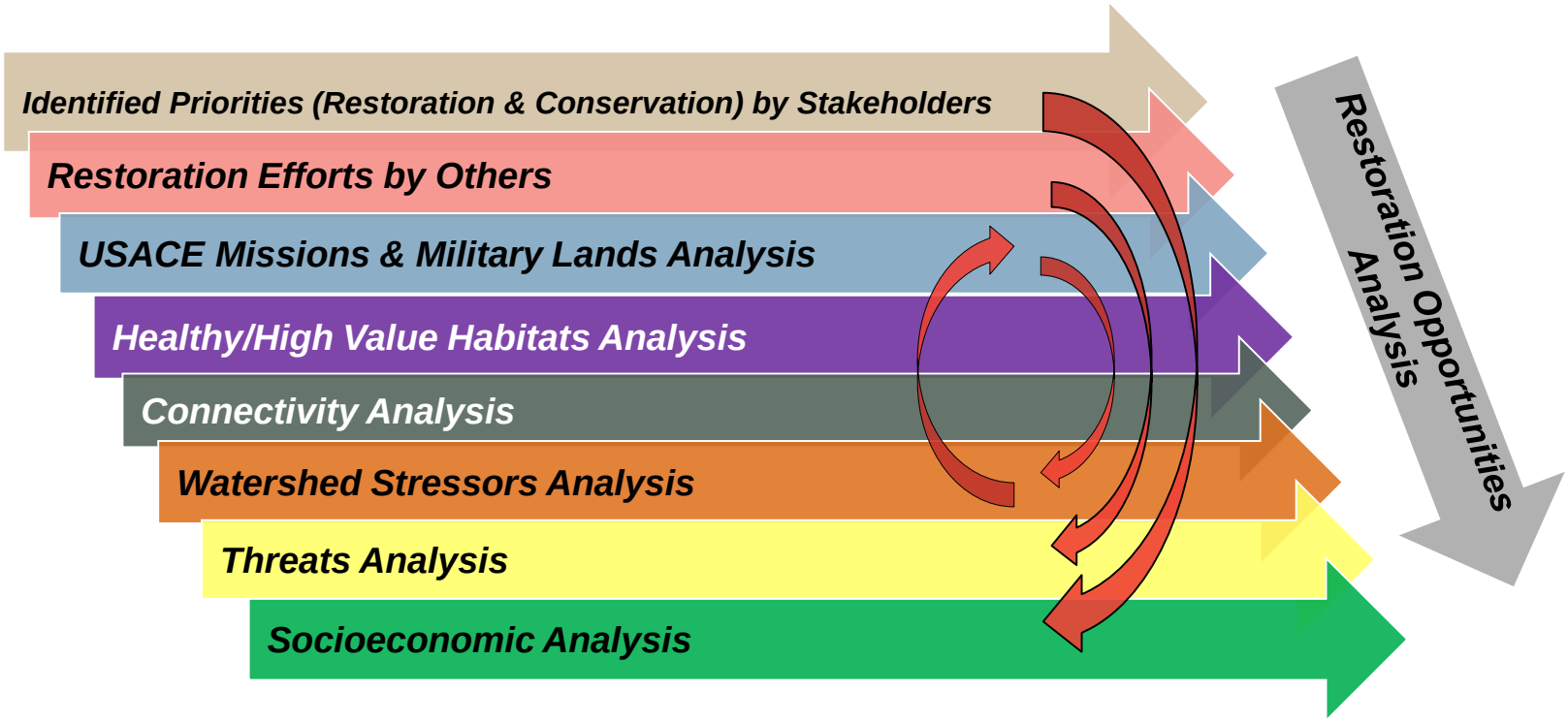
The study used approximately **70** of these layers in the geospatial analysis.

Challenges:

- Data Corruption
- Delay of data delivery
- Obtaining the most current data in the correct format
- Receiving team agreement on most appropriate data set
- Finding complete data set to cover entire study area
- Receiving no metadata or POC information with the file
- Projection issues

COMPOSITE ANALYSES

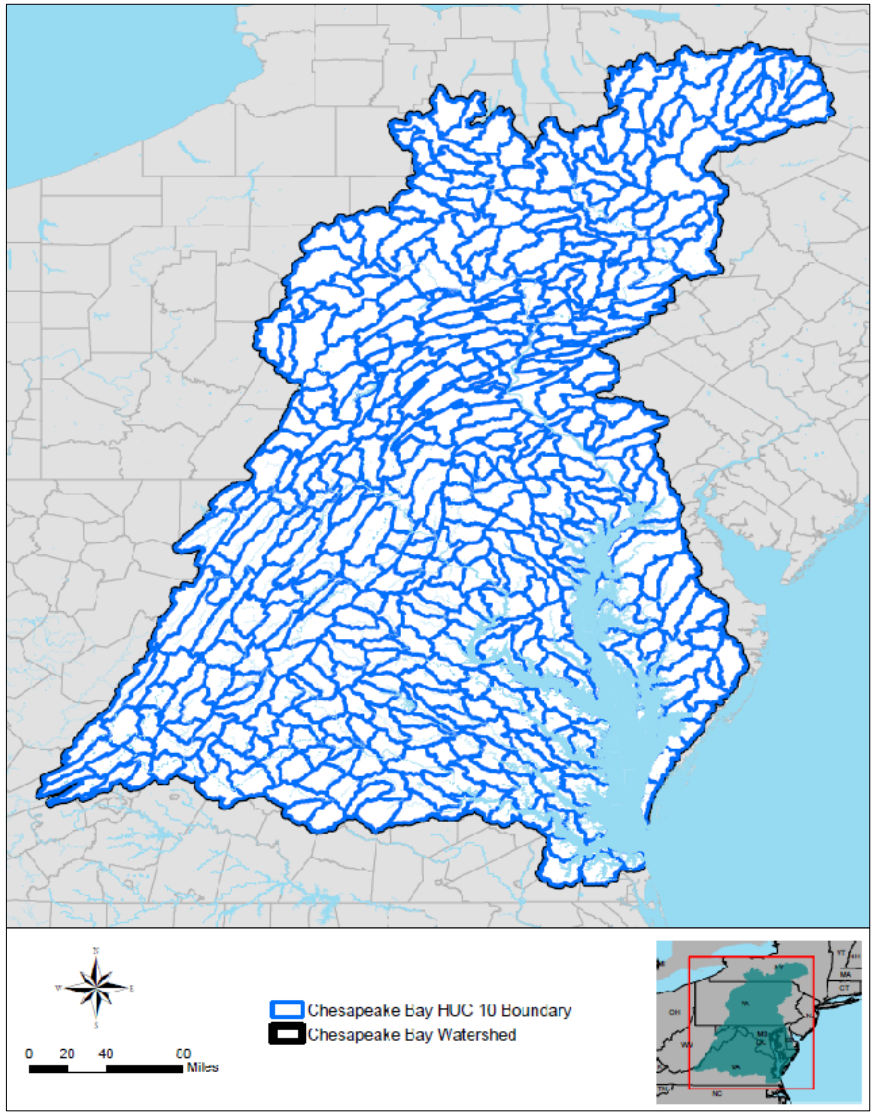
- Composite analyses act as “building blocks.”
- Each composite analysis combines a number of data layers focused on one topic.
- Composite analyses are combined and evaluated in different combinations to assist in identifying restoration opportunities.



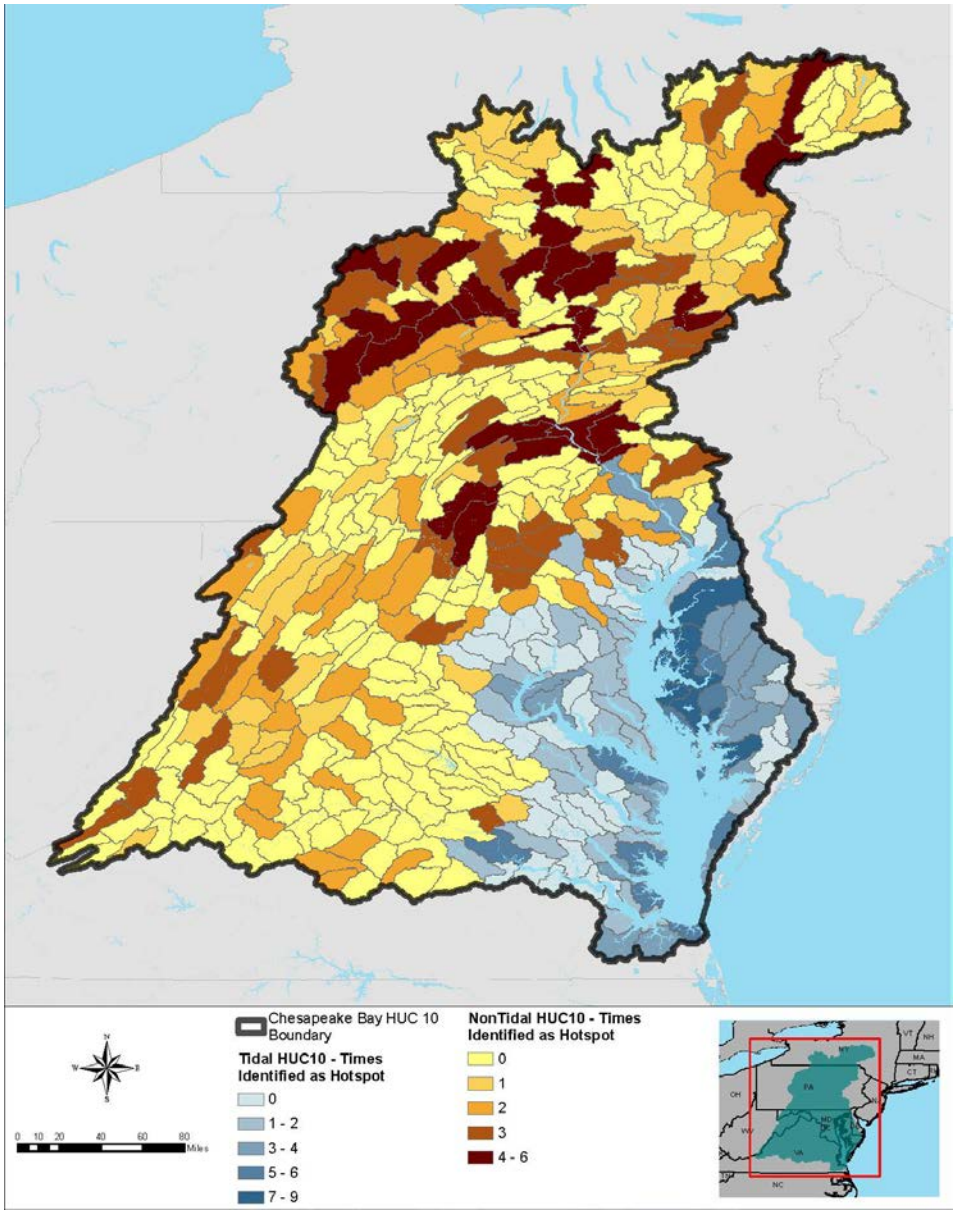
RESTORATION OPPORTUNITY ANALYSIS:
TARGETED GEOSPATIAL INVESTIGATIONS

1. Habitat restoration – riparian buffers, stream restoration, and fish passage for Eastern brook trout, resident, and anadromous fish plus oysters, and SAV.
2. Wetland restoration - restoration and enhancement of tidal ad non-tidal wetlands, wetland restoration to benefit avian wildlife, and beneficial use of dredged material.
3. Connectivity – connectivity of healthy habitats to restoration opportunities and connectivity to socioeconomic resources.
4. Conservation of lands to promote watershed healthy, species, and socioeconomic benefits
5. Shorelines and streambanks – at risk shorelines and proximity to restoration opportunities
6. Toxic contaminants

TECHNICAL APPROACH- WATERSHED ANALYSIS



- Watershed Wide
- Implementation Strategy: Hydrologic Unit Code 10 (HUC10) scale
  - 425 HUC10s
  - Range in size from 30,000 to 754,000 acres
  - Average HUC10 is 103,500 acres



PRELIMINARY SYNTHESIS OF FINDINGS

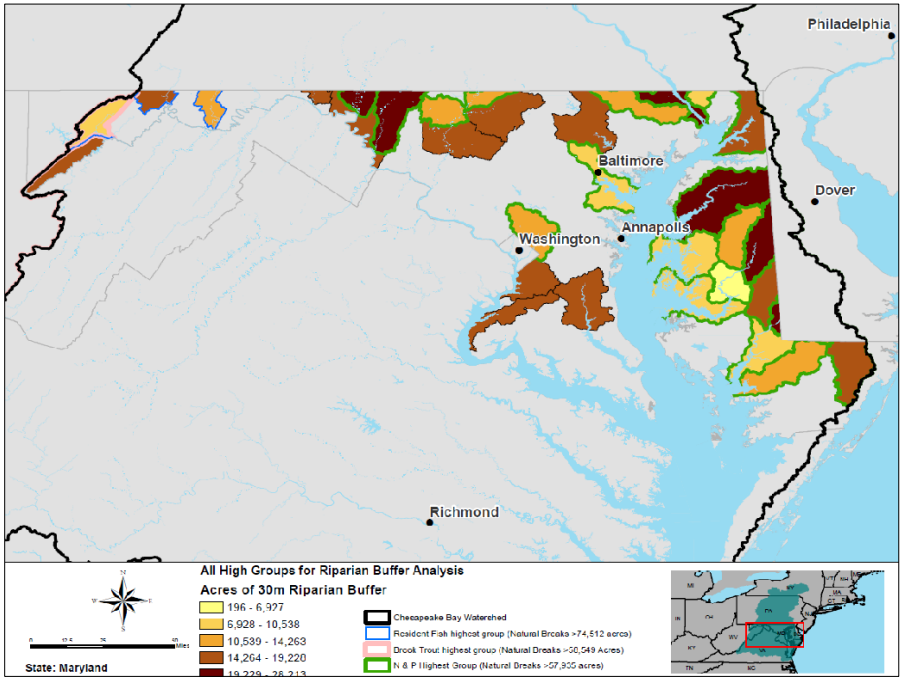
Each targeted geospatial investigation identified HUC10 hotspots. These HUC provide opportunities to address a number of individual outcomes and are focus areas for action when evaluating on the full watershed scale. HUC not identified as basin-wide hotspots hold vast opportunities to address local priorities and needs.

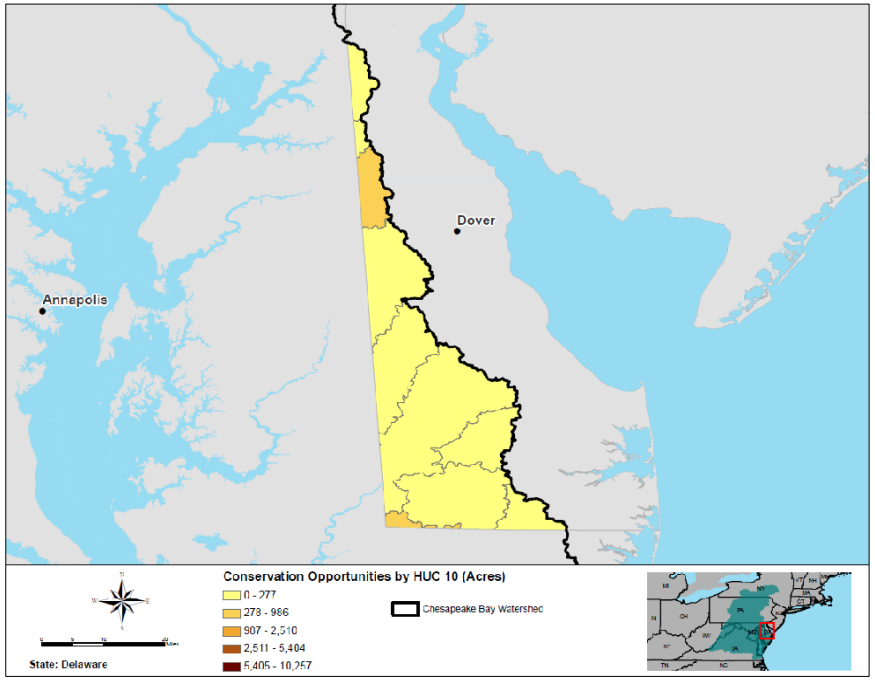
PRELIMINARY FINDINGS, NEEDS AND OPPORTUNITIES

- 25 Top Tier high prioritized HUC's identified with broad and multi-benefit opportunities.
- Opportunities for USACE Implementation identified- Shoreline habitat restoration, Wetlands, Streams, Oysters, SAV- Section 510, CAP 206, 103, 14 (if public infrastructure is at risk) GI, CG.
- Limitations to where USACE can implement- opportunities identified for stakeholders as well- riparian buffers, acid mine drainage, water quality, land conservation, Remediate and Control Toxic Contaminants - USACE could offer PAS, IIS or military planning if military lands.
- Identified opportunities Bay-wide to meet Bay Agreement Goals
- Bay Agreement identifies 'who' and 'what'- CBCP intent is to assist with 'where'.

TECHNICAL APPROACH-
STATE ANALYSIS

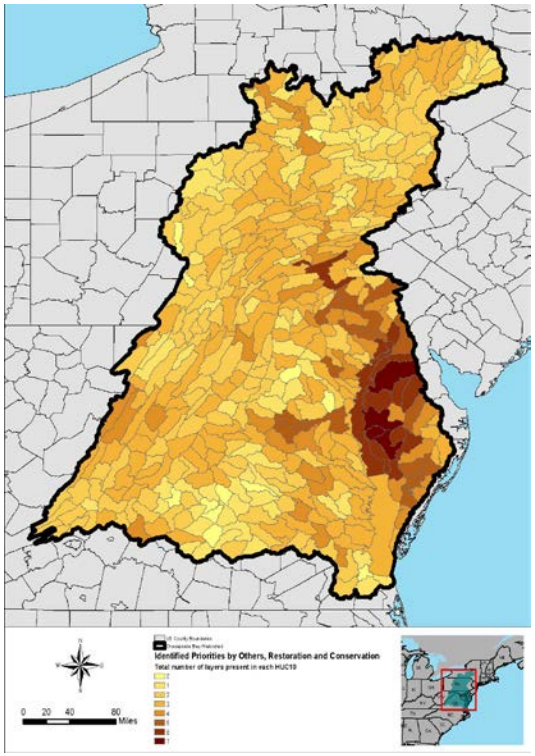
- Watershed-wide results that are “clipped” maps per state (NY, PA, WV, MD, DE, and VA) and the District of Columbia (D.C.).
- Refined recommendations from Watershed-wide Analysis narrowed for each state and D.C.



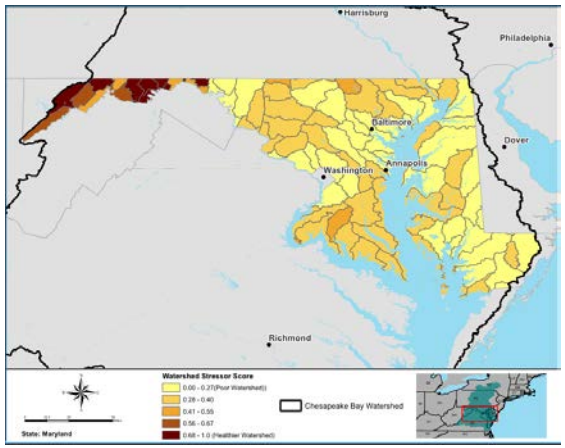


SUBWATERSHED ANALYSIS OBJECTIVES

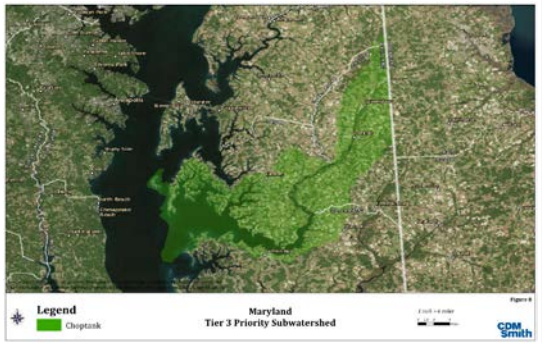
For one priority subwatershed per jurisdiction, present a smaller scale prioritization effort within the identified priority subwatershed to develop a smaller scale watershed action plan.



Watershed



State



Subwatershed

PRIORITY SUBWATERSHED OVERVIEW

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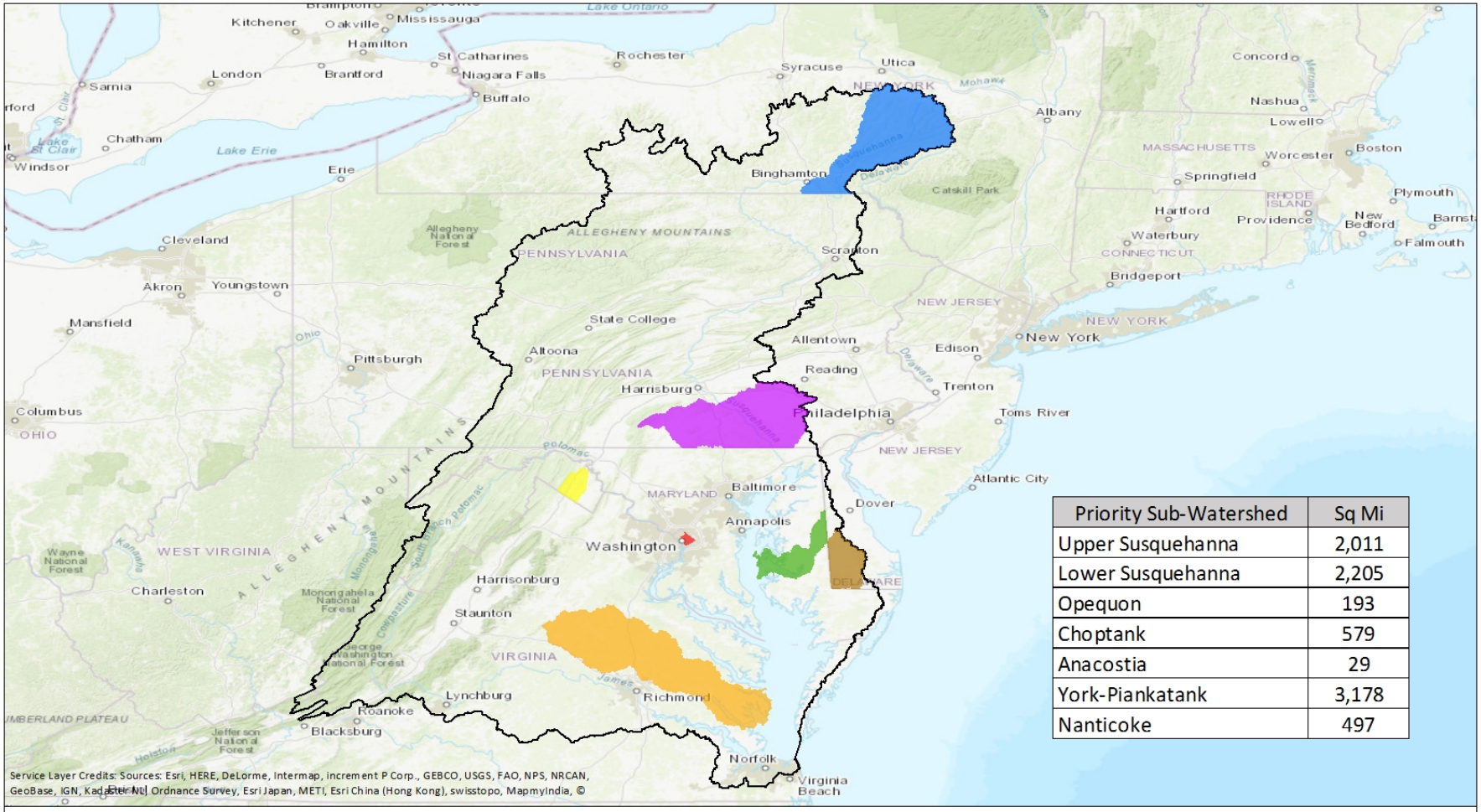
TECHNICAL APPROACH
SUBWATERSHED ACTION PLAN DEVELOPMENT

State	Priority Subwatershed	Primary Restoration/Product	Plans/Reports/Studies that identify subwatershed as priority
NY	Upper Susquehanna River Watershed	Stream restoration, wetland creation/restoration, riparian forest buffers	Susquehanna River Watershed Reports Upper Susquehanna identified as a priority by TNC and FWS
PA	Lower Susquehanna River Watershed	Stream restoration, legacy sediment, wetland creation/restoration	PA State Water Plan Lower Susquehanna River identified as a priority by TNC and FWS
WV	Conococheague - Opequon Watershed	Technical services & possible design-build opportunities with a focus on green infrastructure. Source water protection planning. Public sewer in Karst areas.	Eastern Panhandle Regional Planning & Development Council 2017 Hazard Mitigation Plan Conococheague – Opequon identified as a priority by NFWF, TNC, and FWS
MD	Choptank River Watershed	Stream restoration & wetland creation, agricultural BMPs, blue/green infrastructure	Upper Choptank River Strategic Watershed Restoration Action Plan NOAA Choptank Habitat Focus Area Group Choptank identified as a priority by Ducks Unlimited, NOAA, NFWF, TNC, and FWS
DE	Nanticoke River Watershed	Stream restoration & wetland creation, agricultural BMPs	Nanticoke Non-Tidal Wetland Condition Report Nanticoke Restoration Plan Nanticoke identified as a priority by Ducks Unlimited, NFWF, TNC, and FWS
DC	Mainstem Anacostia River Watershed	Wetland creation, seawall removal, living shoreline creation, and habitat restoration in the main stem of the Anacostia. Work with stakeholders to develop a vision plan.	Anacostia River Watershed Restoration Plan and Report Mainstem Anacostia River identified as a priority by TNC and FWS
VA	Middle Peninsula (York/Mobjack Bay/Piankatank Watershed)	Vegetative buffers, oyster bed restoration, wetland creation/restoration	Oyster Restoration Outcome Management Strategy – 2015-2025, v.1; Oyster Restoration 2016-2017 Work Plan Identified as a priority by NFWF, TNC, and FWS Opportunities for Black Duck, SAV, Wetlands, Oyster Restoration, Fish Habitat, Forage Fish, Blue Crab, Climate Resiliency, Healthy Watersheds and more



Priority Sub-Watershed	Sq Mi
Upper Susquehanna	2,011
Lower Susquehanna	2,205
Opequon	193
Choptank	579
Anacostia	29
York-Piankatank	3,178
Nanticoke	497

Legend

- Upper Susquehanna (HUC 8)
- Lower Susquehanna (HUC 8)
- Piankatank (HUC 8)
- Opequon (HUC 10)
- Anacostia (HUC 10)
- Choptank (HUC 10)
- Nanticoke (HUC 8)
- Chesapeake Bay Watershed Boundary

Overview -Tier 3 Subwatersheds Bounded by State Lines

1 inch = 55 miles

0 12.5 25 50 Miles

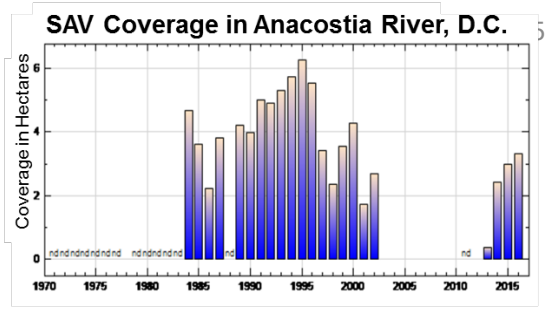
Figure 1

SUBWATERSHED ACTION PLAN DEVELOPMENT

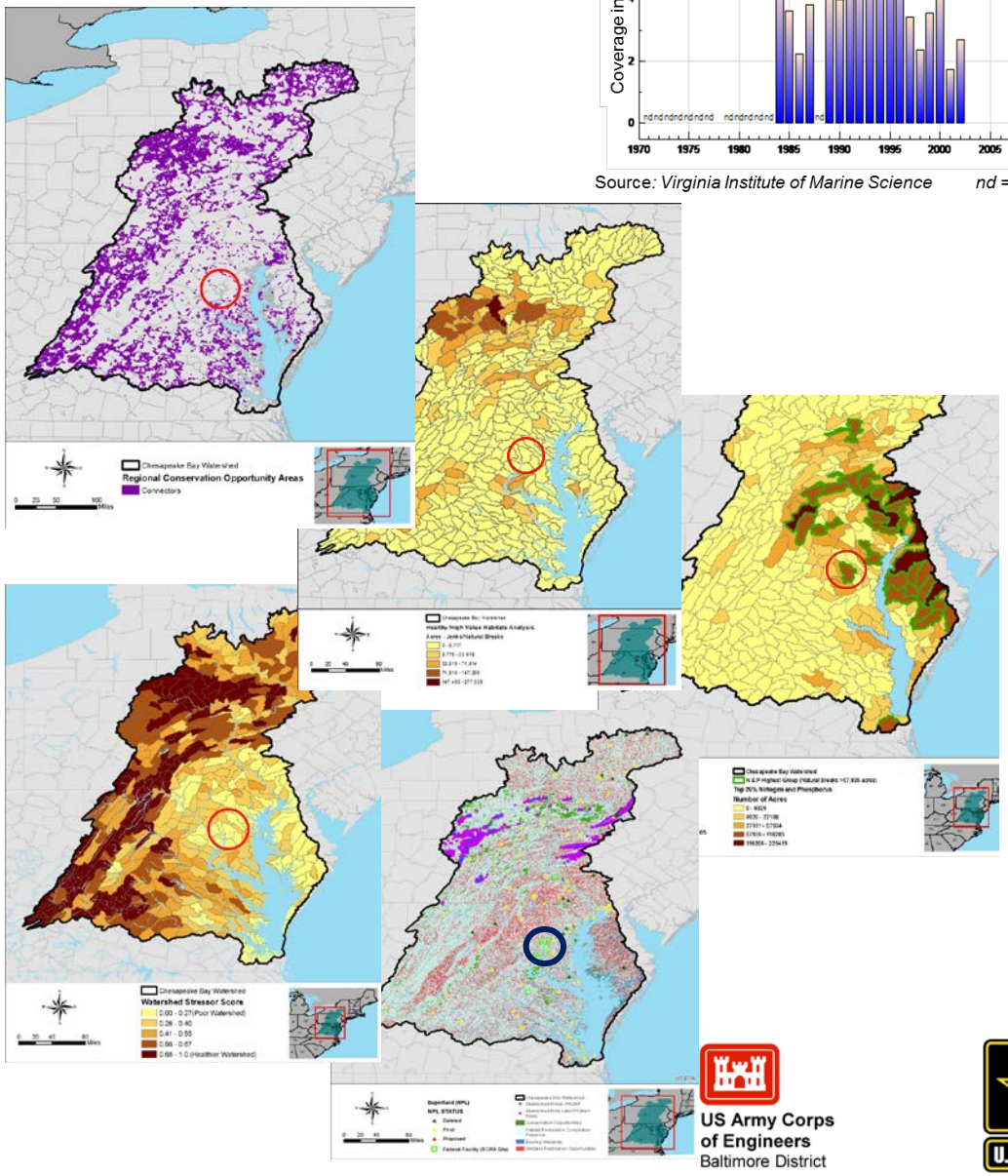
1. Watershed Analyses results – Problems and Opportunities
2. Local GIS datasets
3. Review of existing projects, ongoing efforts, Planned projects, reports, & studies

ANACOSTIA PROBLEMS

- Anacostia is one of the most heavily stressed watersheds within the Chesapeake
- Limited habitat availability/connectivity
- Limited SAV coverage
- Nutrient loading
- Other contaminants



Source: *Virginia Institute of Marine Science* *nd = not determined*



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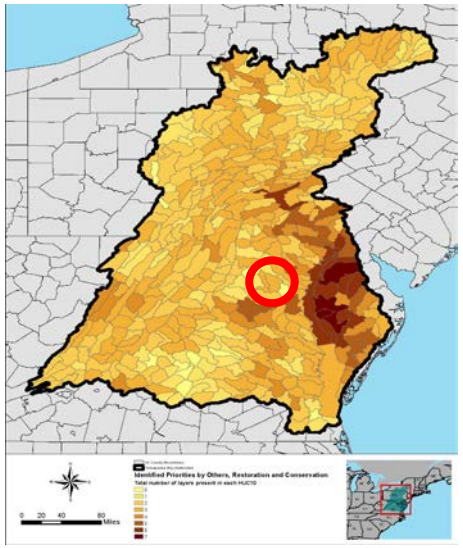
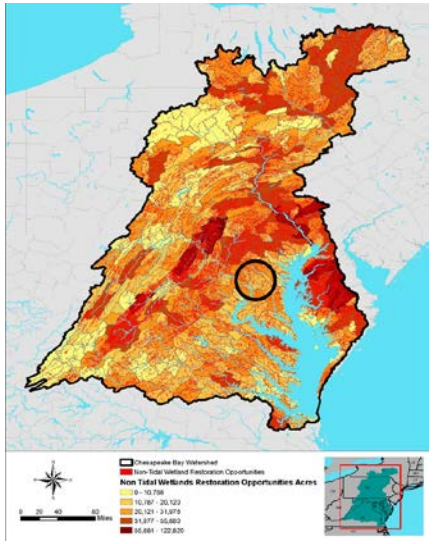
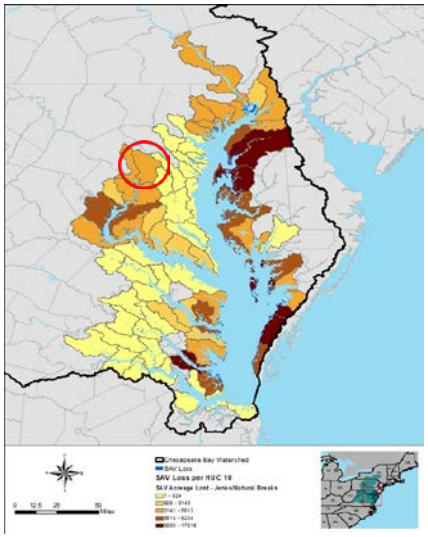
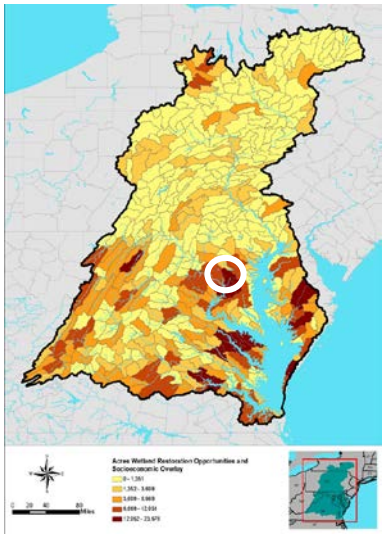
ANACOSTIA OPPORTUNITIES

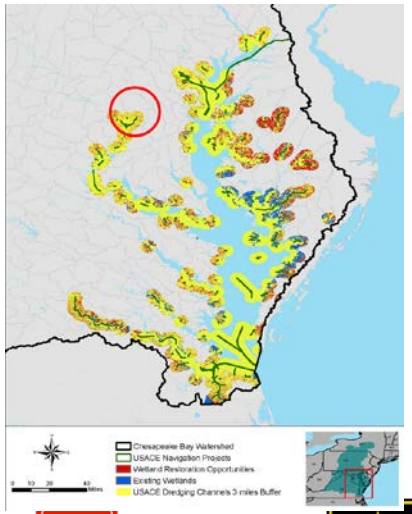
- Moderate priority for restoration and conservation based on work by federal agencies.
- SAV Restoration
- Wetland restoration and enhancement
  - High socioeconomic impact
  - Opportunities to use dredged materials to restore/enhance wetlands











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PENNSYLVANIA: LOWER SUSQUEHANNA

PROBLEMS

- Lower Susquehanna is one of the most heavily stressed watersheds within the Chesapeake
- High priority for conservation and recreation based on work by federal agencies
- Poor habitat connectivity
- High vulnerability to non-tidal threats such as:
  - Increased flooding
  - Habitat degradation
  - Future predicted development
- Nitrogen and Phosphorus inputs

OPPORTUNITIES

- Riparian Buffer restoration
- Agricultural BMPs
- Habitat Conservation / Restoration
- Dam removal / fish passage

MARYLAND: CHOPTANK

PROBLEMS

- Choptank is one of the most heavily stressed watersheds within the Chesapeake
- High priority for conservation and restoration based on work by federal agencies.
- Poor habitat connectivity
- High vulnerability to tidal threats such as:
    - Sea level change
    - Frequent flooding
    - Coastal storm risk
    - Erosion
    - Future development
- Lost SAV Habitat

OPPORTUNITIES

- Stream restoration to benefit anadromous fish & removal of fish passage blockages
- Oyster restoration
- Wetland/marsh restoration
    - Shoreline stabilization
    - Marsh migration
    - Restoration through substrate deposition

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VIRGINIA: MIDDLE PENINSULA

PROBLEMS

- Lost SAV habitat
- Shoreline erosion
- Oyster populations
- Fish Passage

OPPORTUNITIES

- Oyster restoration opportunities
- Tidal Wetland/marsh restoration
  - Shoreline stabilization
  - Restoration through soil deposition
- Non-tidal wetland restoration opportunities
- Fish passage

NEW YORK: UPPER SUSQUEHANNA

PROBLEMS

- Medium-stressed watershed
- Low-medium priority for conservation and recreation
- Moderate habitat connectivity:
- Low vulnerability to non-tidal threats
- Low nitrogen and phosphorus output relative to watershed
- High nitrogen output but low phosphorus
- No prioritized fish blockage data

OPPORTUNITIES

- Riparian Buffer restoration
  - High nitrogen areas
- Resident Fish habitat Restoration
- Non-Tidal Wetland Restoration Opportunities

DELAWARE: NANTICOKE

PROBLEMS

- Nanticoke River is one of the most heavily stressed watersheds within the Chesapeake
- High priority for conservation and recreation based on work by federal agencies
- Poor habitat connectivity
- Nitrogen and Phosphorus inputs

OPPORTUNITIES

- Stream restoration to benefit anadromous fish & removal of fish passage blockages
- Culvert assessments for fish passage
- Riparian Buffer restoration
- Wetland restoration and enhancement
- Undertake restoration and conservation to benefit avian wildlife
- Agricultural BMPs

WEST VIRGINIA: OPEQUON

PROBLEMS

- Opequon Creek is a heavily stressed watershed within the Chesapeake Bay Watershed
- Poor habitat connectivity
- Non-tidal threats

OPPORTUNITIES

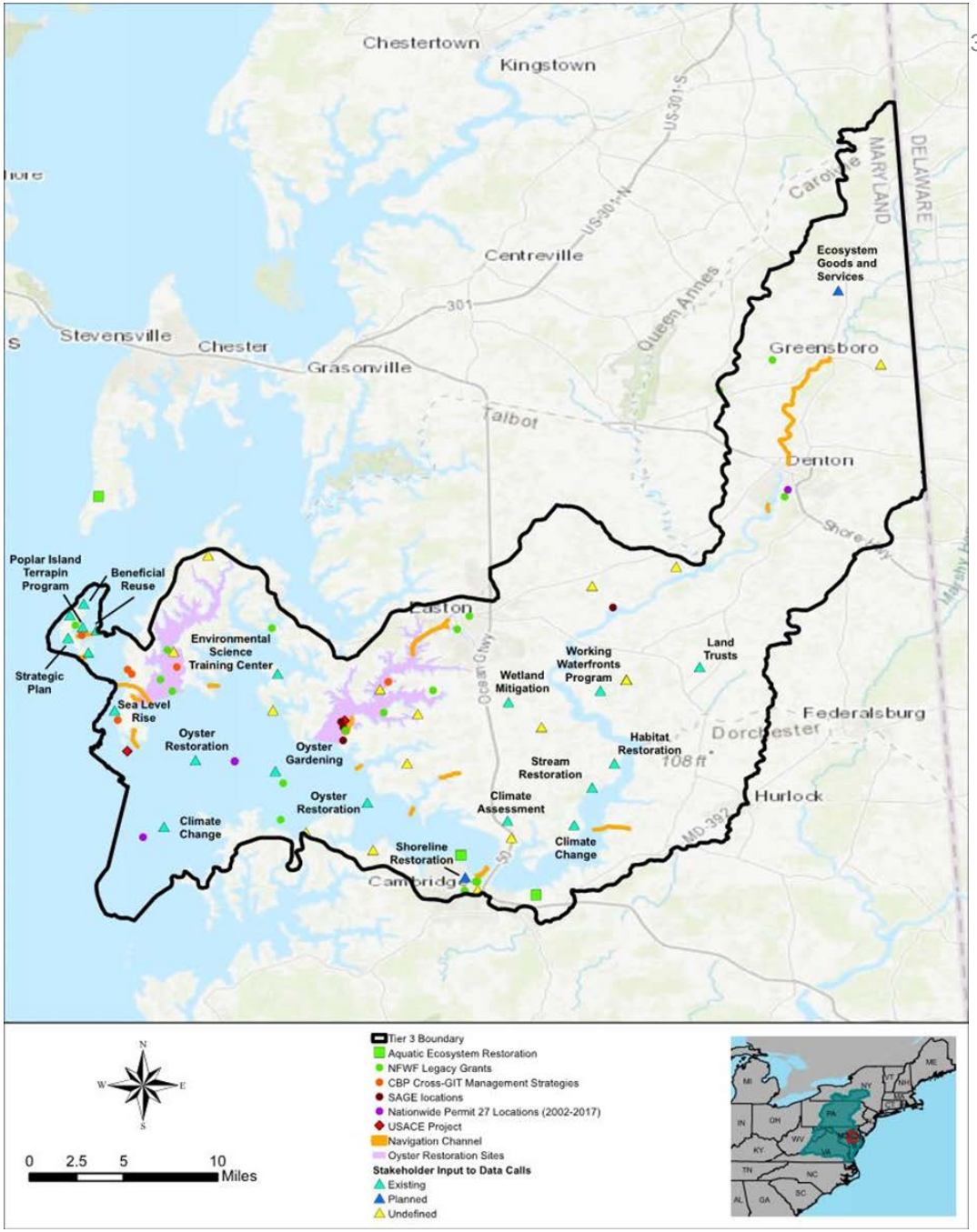
- Riparian buffer restoration
- Wetland restoration
- Undertake restoration and conservation to benefit rare, threatened, and endangered species

STAKEHOLDER IDENTIFIED:

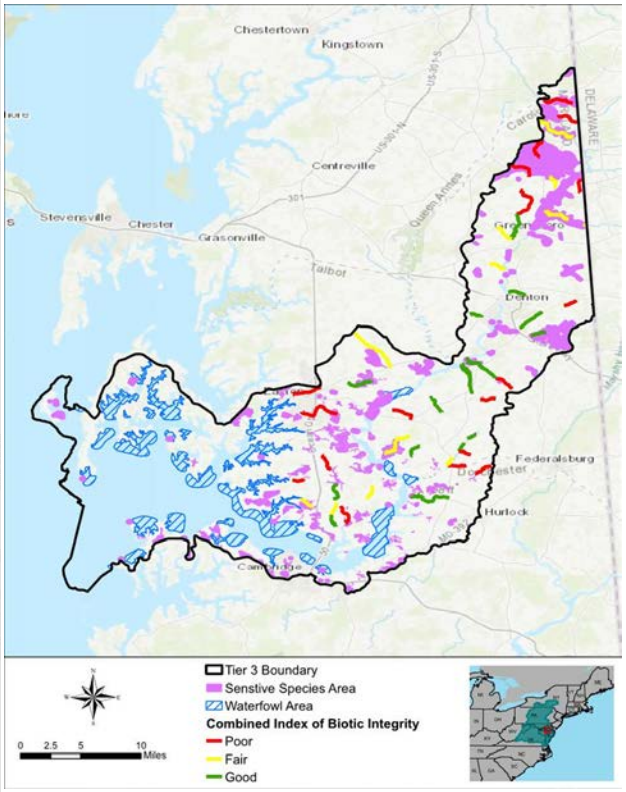
- Technical services and possible design-build opportunities
- Green Infrastructure

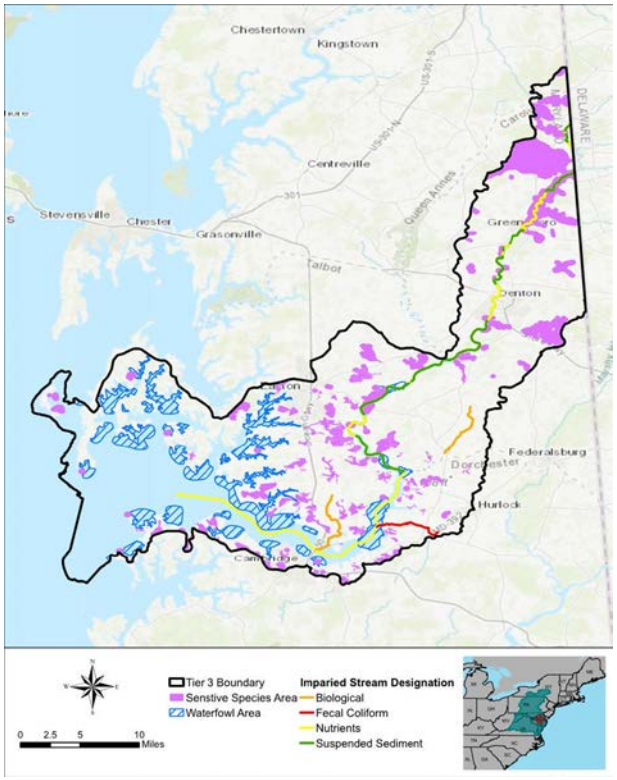
CHOPTANK RIVER PLAN DEVELOPMENT

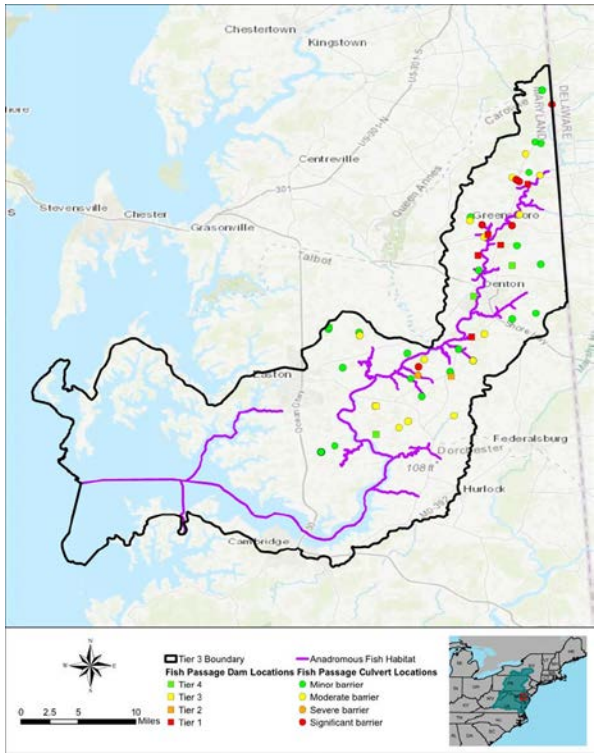
EXISTING PROJECTS



LOCAL DATA







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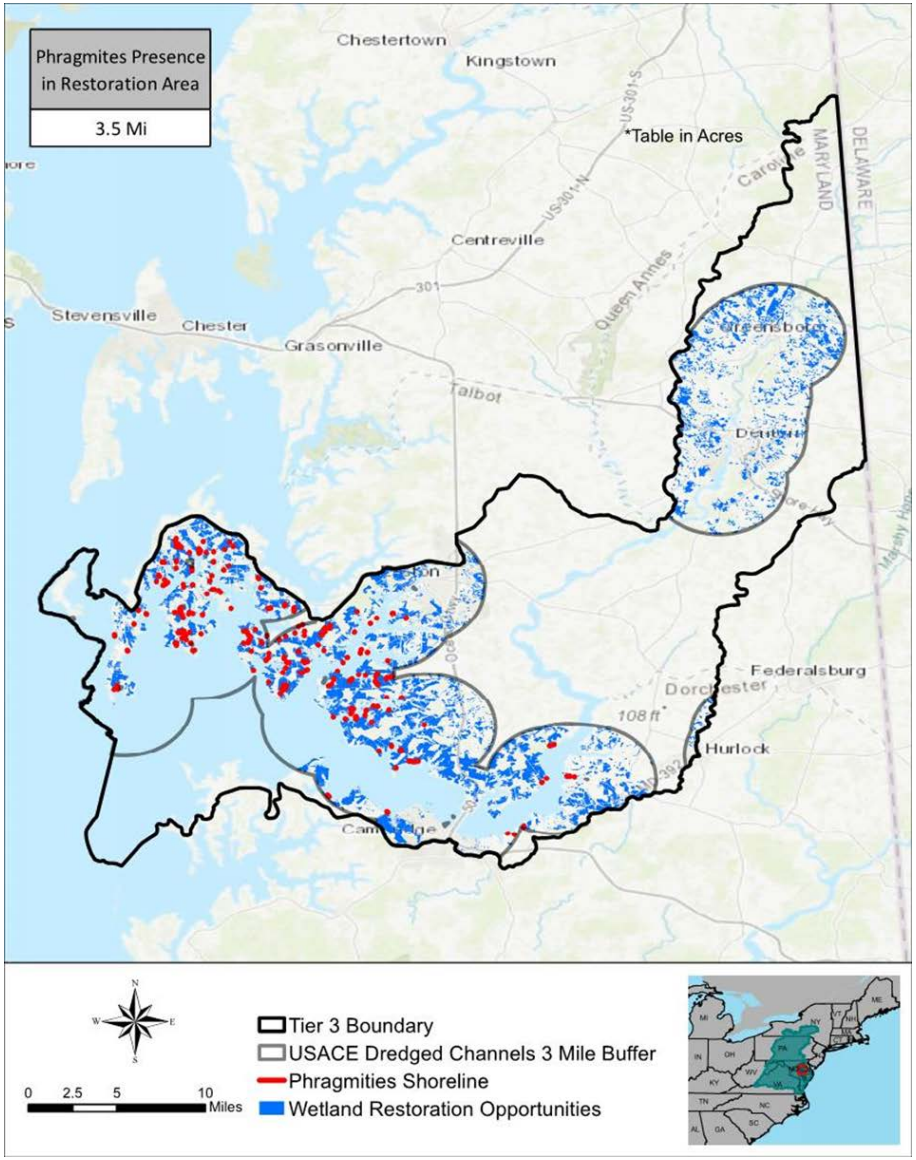
PRELIMINARY RESULTS:
WETLAND RESTORATION

- Further refine to consider marsh migration corridors, Targeted Ecological Areas, Sensitive species habitat, Waterfowl areas, patch size

- Consider non-tidal wetland opportunities also



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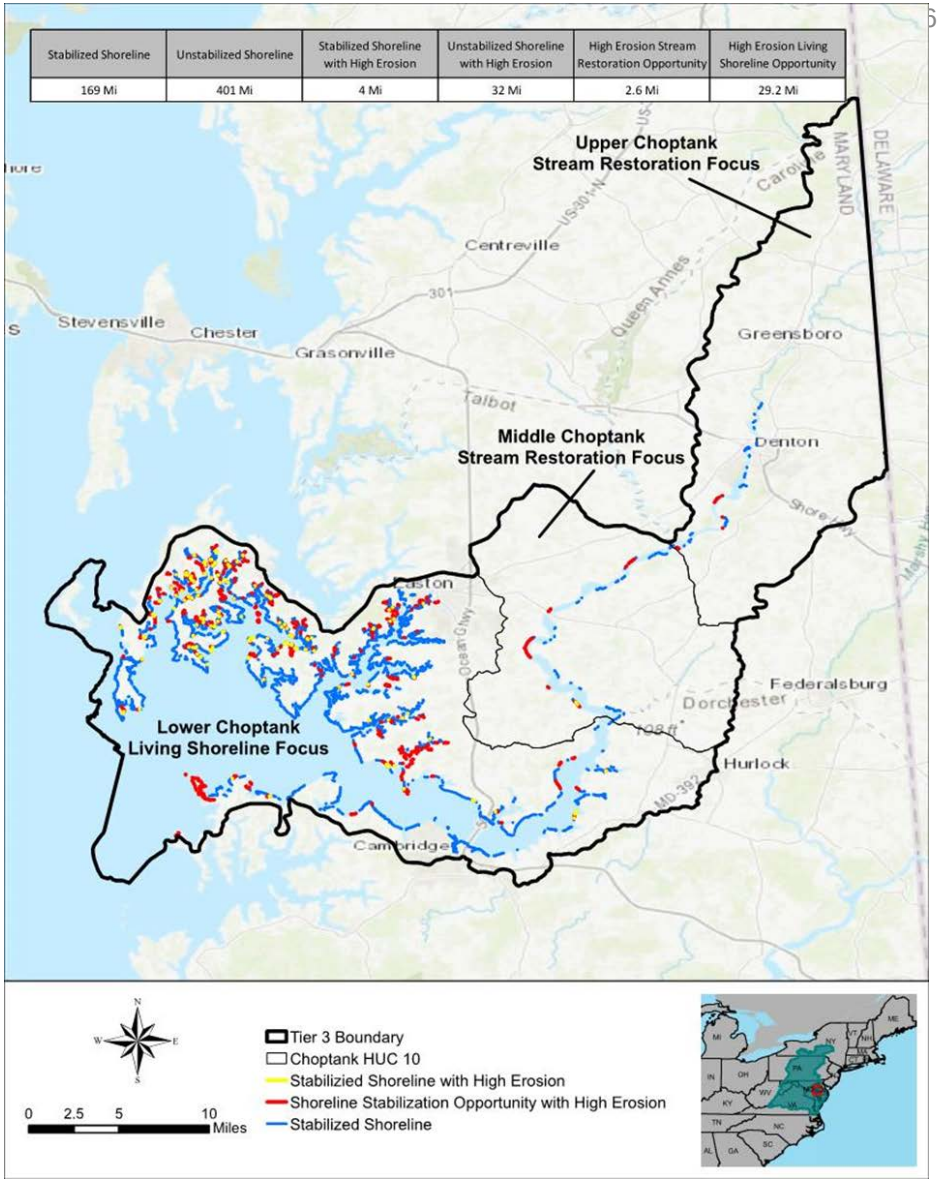
PRELIMINARY RESULTS:
SHORELINE HABITAT

- Continue to refine to identify potential projects



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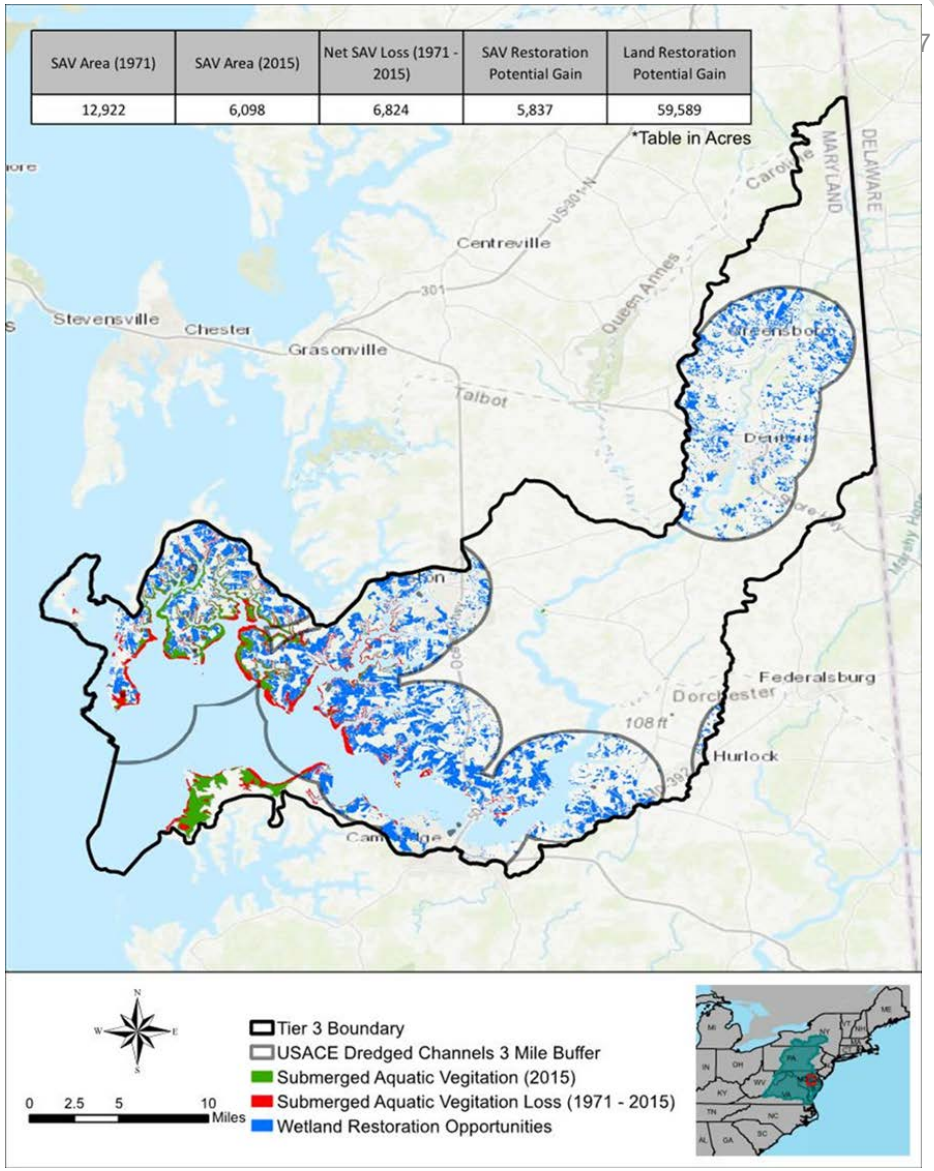
PRELIMINARY RESULTS: *SAV*

- Continue to refine to identify potential projects

SAV Area (1971)	SAV Area (2015)	Net SAV Loss (1971 - 2015)	SAV Restoration Potential Gain	Land Restoration Potential Gain
12,922	6,098	6,824	5,837	59,589

*Table in Acres



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ADDITIONAL CHOPTANK INVESTIGATIONS ONGOING

1. Riparian Buffer Restoration
2. BMPs for water quality – stormwater and agriculture
3. Stream restoration
4. Fish passage
5. Conservation
6. Considerations for rare, threatened, and endangered species

PATH FORWARD

Winter 2017-2018 – Complete Integration Analyses, Draft Report Prep, and Internal Reviews

June 2018 – Public Review

Summer-Winter 2018 – Revisions and Final Draft Report Submission to USACE HQ

Summer 2019 – Final Report Submittal to Congress