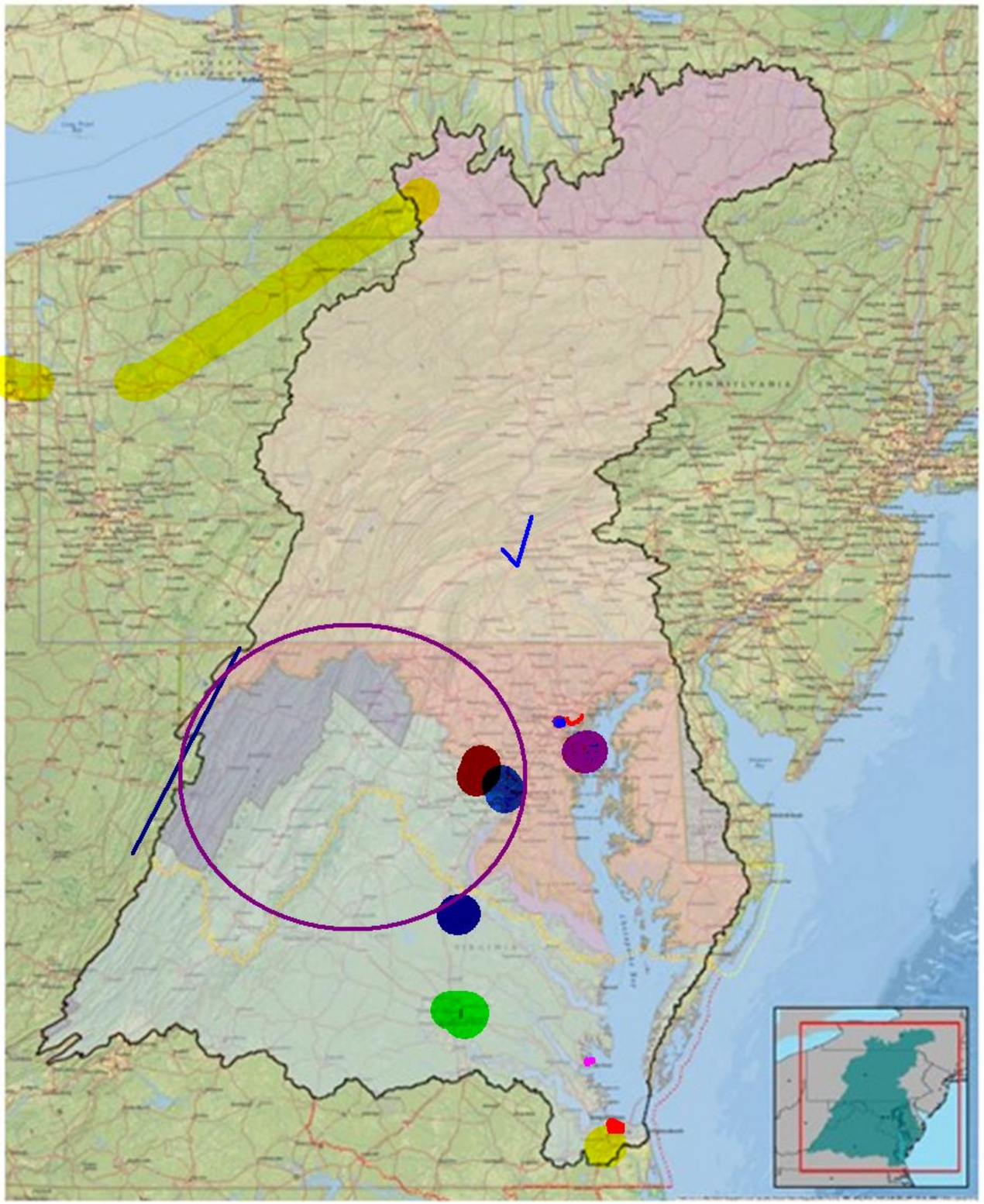
INTRODUCTION/PLACE MARK ON YOUR LOCATION

Regional, Non-government organization, Academia, etc. place your mark here:



Chesapeake Bay Comprehensive Water Resources and Restoration Plan

CHESAPEAKE BAY COMPREHENSIVE WATER RESOURCES AND RESTORATION PLAN

Webinar

27 February 2017

"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."

NFWF

US Army Corps of Engineers
Norfolk District

US Army Corps of Engineers
Baltimore District

U.S.ARMY

AGENDA

- Key Authorities and Documents
- Study Area
- Shared Vision
- Background
- Stakeholder Collaboration
- Goal
- Draft Objectives
- Measures
- Plan Formulation and Maps
- Q & A
- Interactive Activities
- Data Call
- Next Steps

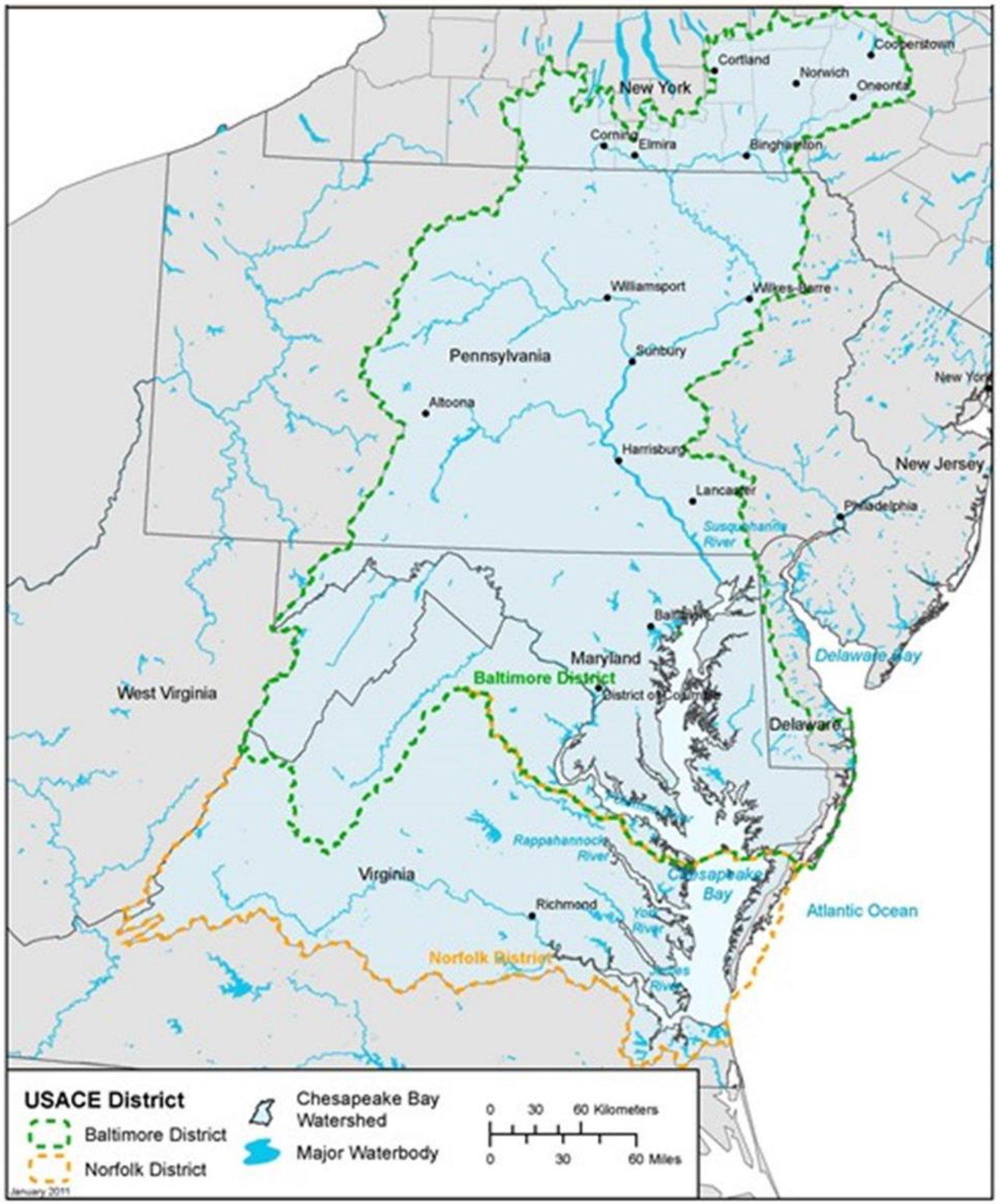
KEY AUTHORITIES AND DOCUMENTS

- United States Senate Committee on Environment and Public Works, Committee Resolution - 26 September 2002
- Section 4010(a) Water Resources Reform and Development Act (WRRDA) 2014 - Implementation Guidance - 8 December 2015
- Planning Bulletin 2016 Watershed Studies - 30 September 2016
- Chesapeake Bay Agreement 2014
- Executive Order 13508 Strategy 2010

STUDY AUTHORITY

"Resolved by the Committee on Environment and Public Works on the United States Senate, that the Secretary of the Army is requested to review the report of the Army Corps of Engineers on the Chesapeake Bay Study, dated September 1984, and other pertinent reports, with a view to developing a coordinated, comprehensive ***master plan*** *within the Corps mission areas for* ***restoring, preserving*** *and* ***protecting*** *the Chesapeake Bay ecosystem. The plan shall focus on* ***integrating existing and future work of the Corps of Engineers****, shall be developed* ***in cooperation*** *with State and local governments, other Federal agencies, the Chesapeake Bay Program, the Chesapeake Bay Commission, and the Chesapeake Executive Council, and shall encompass all Corps actions necessary* ***to assist in the implementation of the goals of the 2000 Chesapeake Bay Agreement****. The plan shall identify additional feasibility studies and research efforts required to better understand and solve the environmental problems of the Chesapeake Bay."*

STUDY AREA


Cooperstown
Cortland
Norwich
Oneonta
New York
Corning
Elmira
Binghamton
Williamsport
Wilkes-Barre
Pennsylvania
Sunbury
New York
Altoona
Harrisburg
New Jersey
Lancaster
Philadelphia
Susquehanna River
Baltimore
Maryland
Delaware Bay
Baltimore District
District of Columbia
West Virginia
Delaware
Rappahannock River
Virginia
Chesapeake Bay
Richmond
York River
Atlantic Ocean
Norfolk District
James River
USACE District
Baltimore District
Norfolk District
Chesapeake Bay Watershed
Major Waterbody
0 30 60 Kilometers
0 30 60 Miles
January 2011

SHARED VISION

- June 16, 2014, the Chesapeake Bay Watershed Agreement was signed.
- Signatories from all Bay states and the Federal Leadership committee.
- Chesapeake Bay Comprehensive Plan (CBCP) will ALIGN with the Vision established in the 2014 Agreement with a slight change per stakeholder collaboration.

"We envision an environmentally and economically sustainable AND RESILIENT Chesapeake Bay watershed with clean water, abundant life, conserved lands and access to the water, a vibrant cultural heritage, and a diversity of engaged citizens and stakeholders."

BACKGROUND

CBCP will result in a single, integrated restoration plan to:

- **Guide** implementation of actions that **protect**, **restore** and **preserve** the Bay
- **Adopt and Align** actions with what others are doing
- **Avoid duplication** of ongoing or planned actions by others
- Make maximum use of **existing information**
- **Identify** ecological problems, needs, and opportunities
- **Identify** projects for **further study** and **implementation**, including at least one for each Bay state and the District of Columbia

STAKEHOLDER COLLABORATION

- ✓ Webpage:

http://www.nab.usace.army.mil/Missions/Civil-Works/Chesapeake-Bay-Comprehensive-Plan/

- ✓ Email distribution list
- ✓ November Interagency Watershed Planning Collaboration Workshop
- ✓ Webinar (February 27)

Upcoming:

- Data call (Due March 7)
- Webinars (April and June)
- Review of Draft Plan

GOAL

Develop a comprehensive and integrated master plan that would assist with implementation of the 2014 Chesapeake Bay Agreement.

- Effectively and efficiently engage Bay stakeholders to identify ecological problems, needs and opportunities in the watershed and avoid duplication of ongoing or planned actions by others.
- Determine where and how USACE mission areas could be utilized in the watershed to support the goals of the 2014 Chesapeake Bay Agreement.
- Identify actions by other federal, state, and local government agencies and non-governmental organizations (NGOs) in the watershed to address problems outside of USACE mission areas.

DRAFT OBJECTIVES

- Develop a comprehensive and strategic, integrated water resources plan to guide the implementation of projects that will assist in meeting the 2014 Chesapeake Bay Agreement.
- Identify areas for aquatic ecosystem restoration, protection or preservation that will assist in meeting the 2014 Chesapeake Bay Agreement.
- Identify at least one project in each state and D.C. that can be considered for implementation or technical assistance by the U.S. Army Corps of Engineers and supports the Bay Agreement.
- Identify new policies or programs or improve upon existing policies and programs that will help achieve an environmentally and economically sustainable and resilient Chesapeake Bay watershed.

POTENTIAL ENVIRONMENTAL RESTORATION AND PRESERVATION MEASURES

Environmental Enhancement & Restoration

- ❑ Plant native vegetation at restoration site*
- ❑ Construct oyster reef using alternative substrate*
- ❑ Remove dam for fish passage*
- ❑ Harvest Submerged Aquatic Vegetation (SAV) seeds and disperse seeds*
- ❑ Mechanically remove invasive English ivy*

Conservation

- ❑ Designate oyster sanctuary for permanent conservation
- ❑ Landowners designate wetland conservation easements

Environmental & Other Benefits

- ❑ Plant native dune grasses*
- ❑ Beneficially use dredged material from navigation channels to restore eroding marsh islands*
- ❑ High school students conduct monitoring of wetland restoration project*
- ❑ Restore reefs using alternative substrate (that reduces wave attenuation to an eroding shoreline)*
- ❑ Construct a living shoreline* (that protects an eroding shoreline and reduces wave attenuation)*

Potential U.S. Army Corps of Engineers Project Partnership Opportunity

STAKEHOLDER INPUT

Flooding and Storm Damages

Ecosystem Degradation

Economic and Social Vulnerability

Constraints, Inventory Existing Conditions

Future Forecasts

Identified Priorities by others

Composite Analysis

Action by others

Findings, Needs, and Opportunities

Strategies, Cost Ranges, Benefits

Actions for others under their authorities

USACE Actions Roadmap

FULL STRATEGY

Funding and Implementation Strategy

Implementation Barriers, Sequencing

Costs/Benefits

State Plans

U.S.ARMY

Flooding and Storm Damages

- Eroding shorelines
- Flood inundation
- Loss of life/life safety
- Direct and indirect infrastructure damages

Ecosystem Degradation

- Wetlands
- SAV
- Oysters
- Stream health
- Connected habitat/corridors
- Anadromous/diadromous fish
- Brook trout
- Black duck
- Degraded streams
- Forested riparian buffers
- Fish passage
- Rare, threatened, and endangered species
- Bird habitat
- Water quality
- Chemical contaminants
- Legacy sediment
- Tidal fisheries
- Benthic habitats
- Tree canopy/forests
- Blue crab
- Healthy landscapes

Economic and Social Vulnerabilities

- Limited public access/recreation
- Limited education and stewardship
- Aging infrastructure
- Navigation issues – inefficiencies, vessel damages
- Vessel damages due to shoaling
- Water supply
- Source water protection

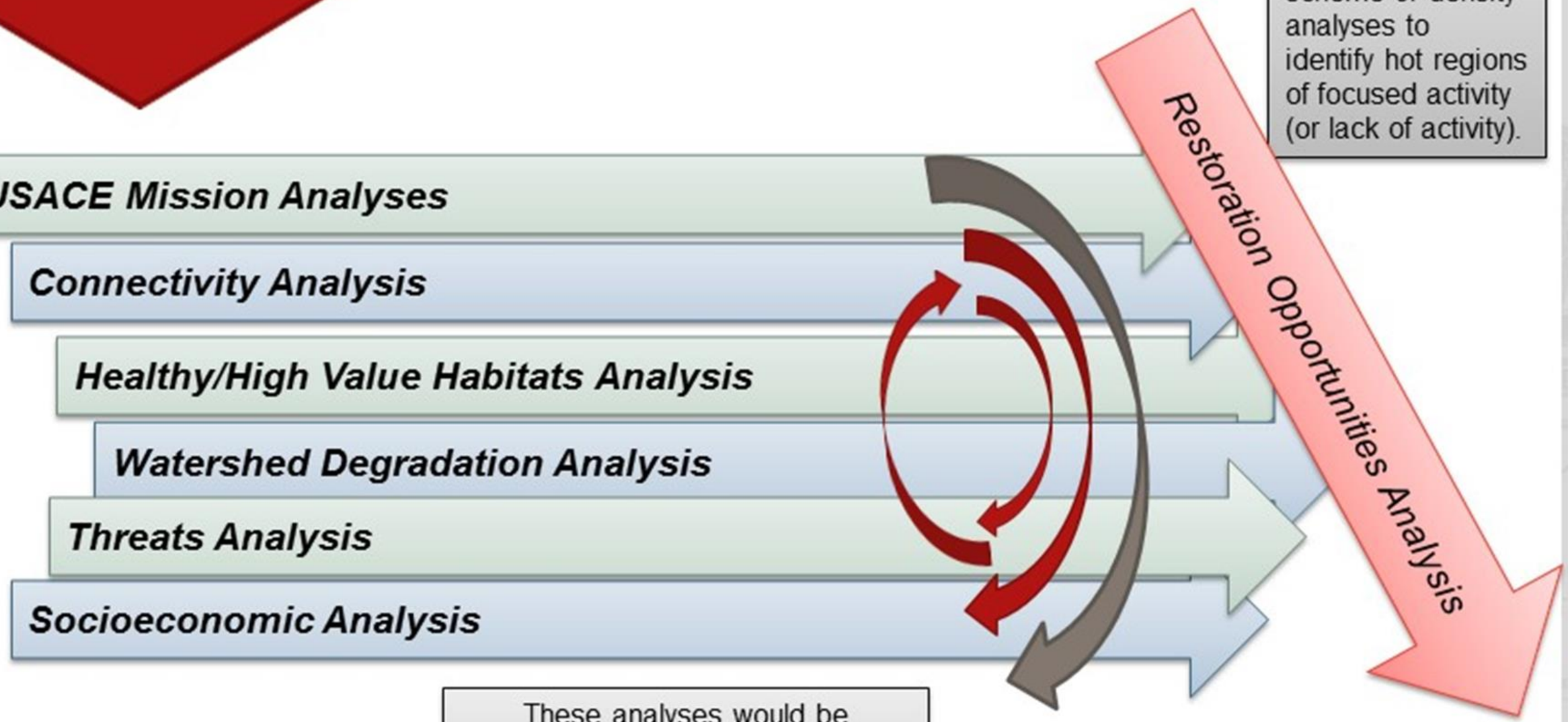
Constraints, Inventory Existing Conditions

Future Forecast and Stakeholder Input

Composite Analysis

COMPOSITE ANALYSES + **Identified Priorities by others** + **Action by others**

GIS cluster analysis or other processes for these evaluations such as a scoring scheme or density analyses to identify hot regions of focused activity (or lack of activity).



These analyses would be completed independently. The results will then be used with results from other analyses to answer questions and develop recommendations.

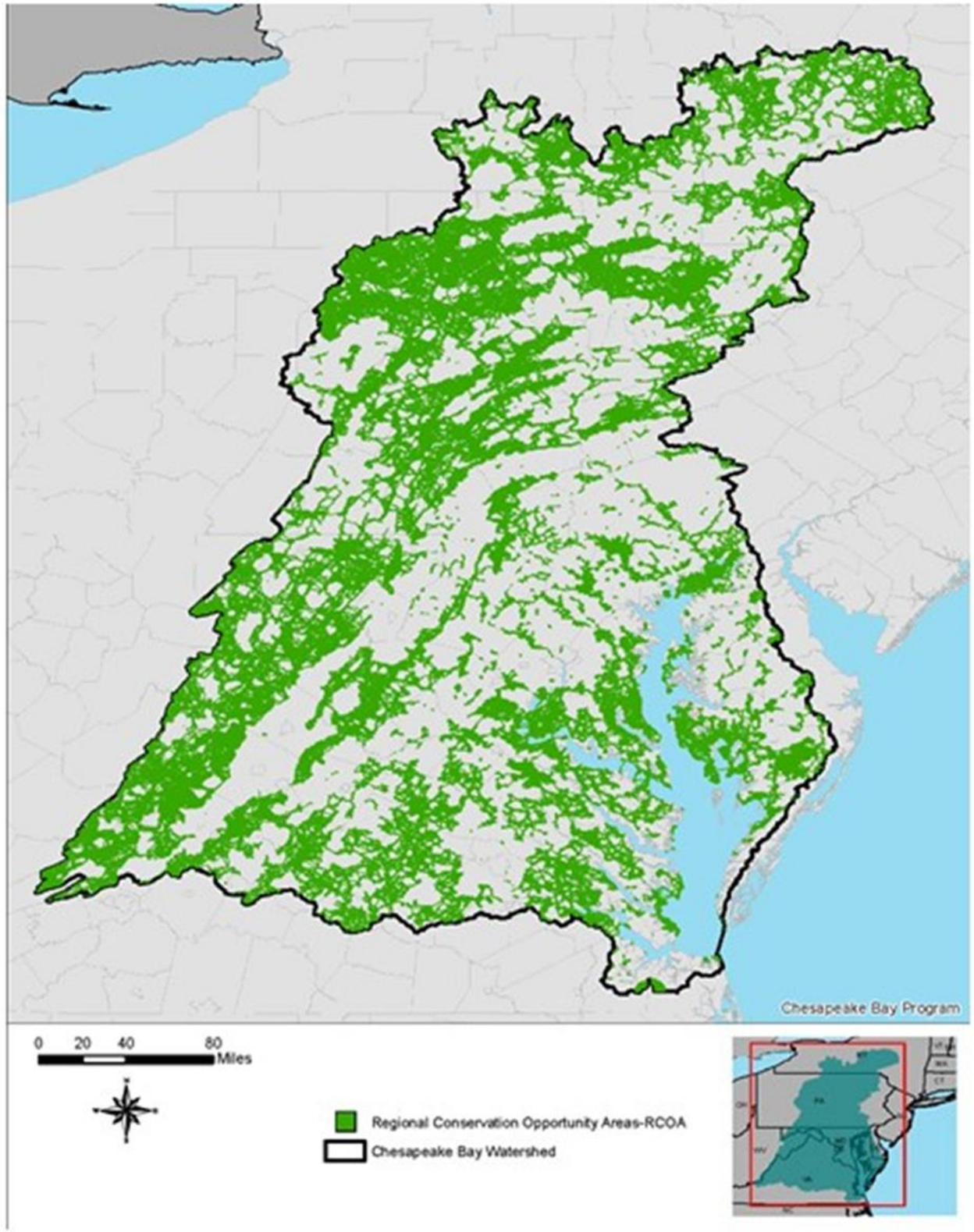
CONNECTIVITY ANALYSIS

Where are the corridors and other landscape features that are critical connectors in the watershed?

Pertinent data:

- Primary migration pathways – marsh
- Bird migration pathways – Atlantic Flyway
- RCOA (Regional Conservation Opportunity Areas) core and connector habitats
- Remote island locations
- Fish Passage blockages

CONNECTIVITY ANALYSIS MAP



SOCIOECONOMIC ANALYSIS

- What locations are important for recreation and public access?
- Where are minority and low income populations located?
- What locations are important for water supply and source water protection?

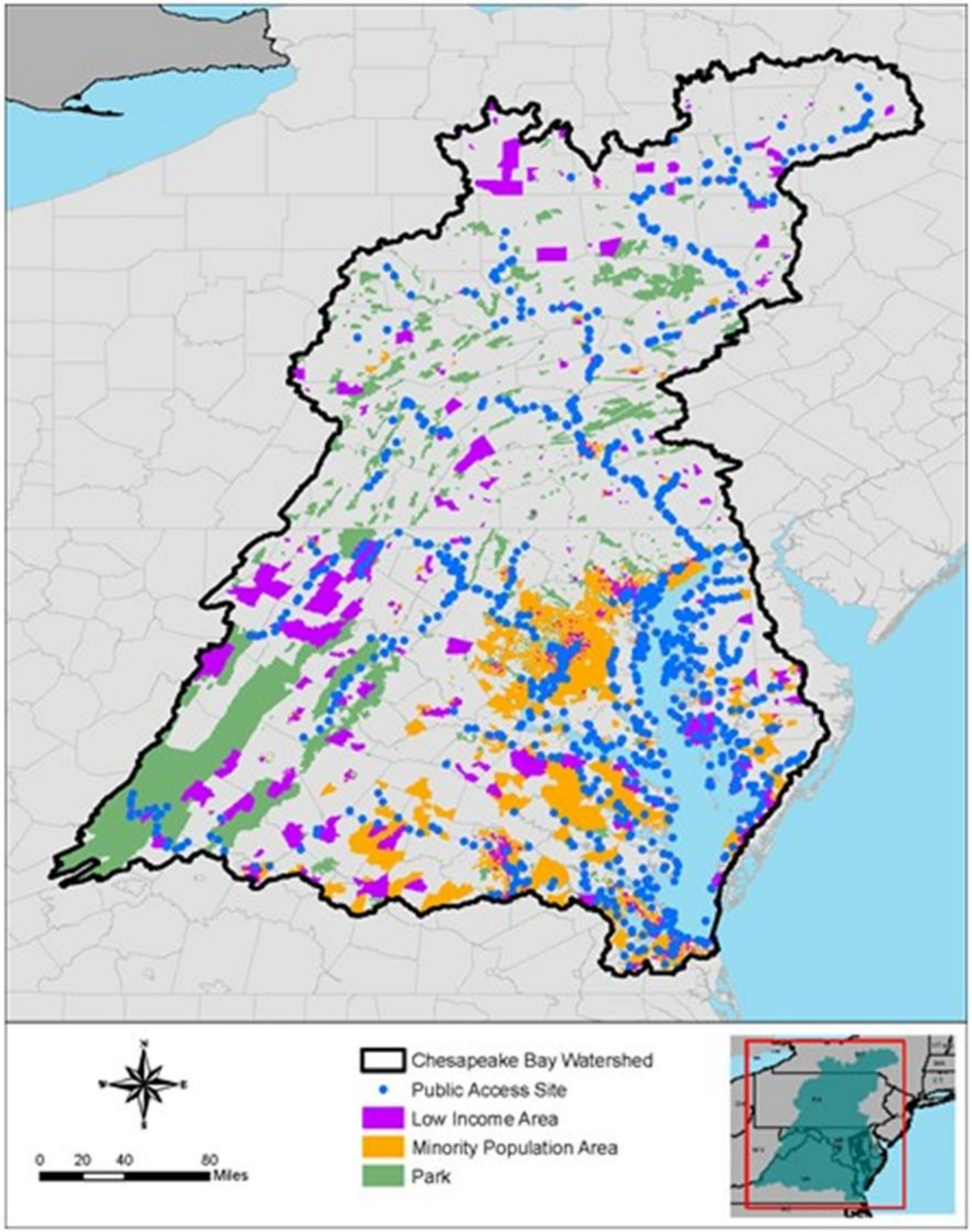
Pertinent data:

- National, state, and local parks
- Public access points
- Minority populations
- Low income populations

Outstanding questions:

Is there data available to capture water supply protection areas? Should the CBP water quality protection value data be utilized (generated from Resource Lands Assessment)?

SOCIOECONOMIC ANALYSIS MAP



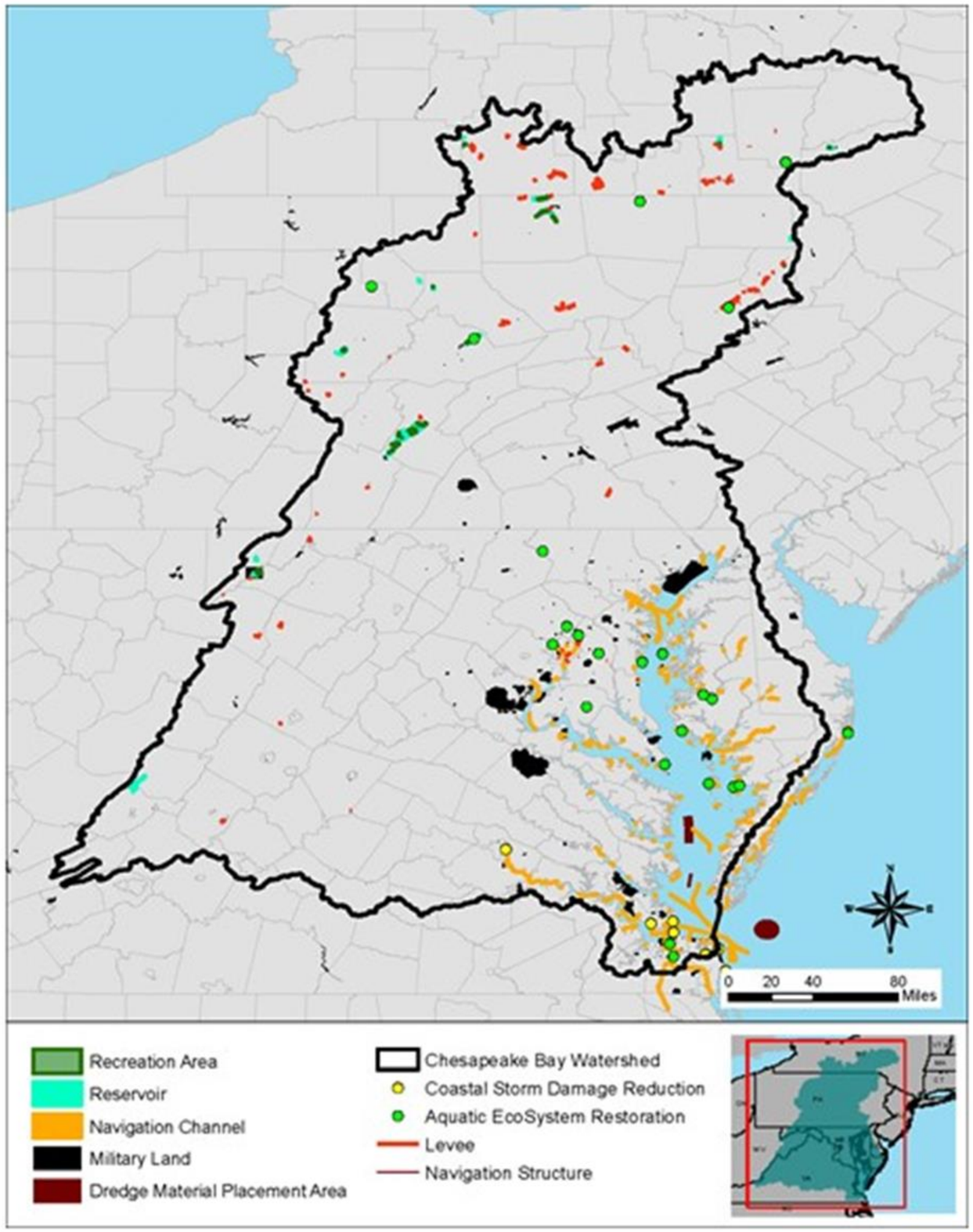
USACE MISSION ANALYSIS

- Where do USACE projects exist (ecosystem restoration, flood risk management, navigation, military, water supply, reservoirs, etc.)?
- What are the geographic boundaries of each USACE authority?

Pertinent data:

- Existing dams and reservoirs
- Existing restoration projects
- Navigational channels and structures
- Military lands
- Existing levees
- Existing coastal storm damage reduction features
- Existing dredged material placement sites

USACE MISSION ANALYSIS MAP

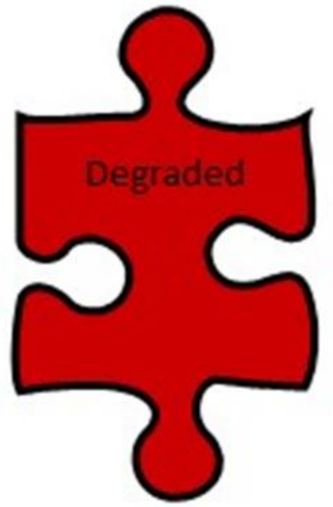


WATERSHED DEGRADATION ANALYSIS

- What subwatersheds are the most degraded?
- Can we summarize the primary problems regionally?

Pertinent data:

- Land use:
  - Percent impervious cover
  - Percent forest
  - Percent forested riparian buffer
- Fish passage blockages
- Stream health
  - Water quality - Impaired streams on 303(d) list
  - Biological integrity – watershed-wide Benthic-IBI
- Impact of nutrient impacts – highest yielding watersheds for Nitrogen (N) and Phosphorus (P)



Outstanding questions:

Should we include areas contaminated with polychlorinated biphenyl (PCBs)?

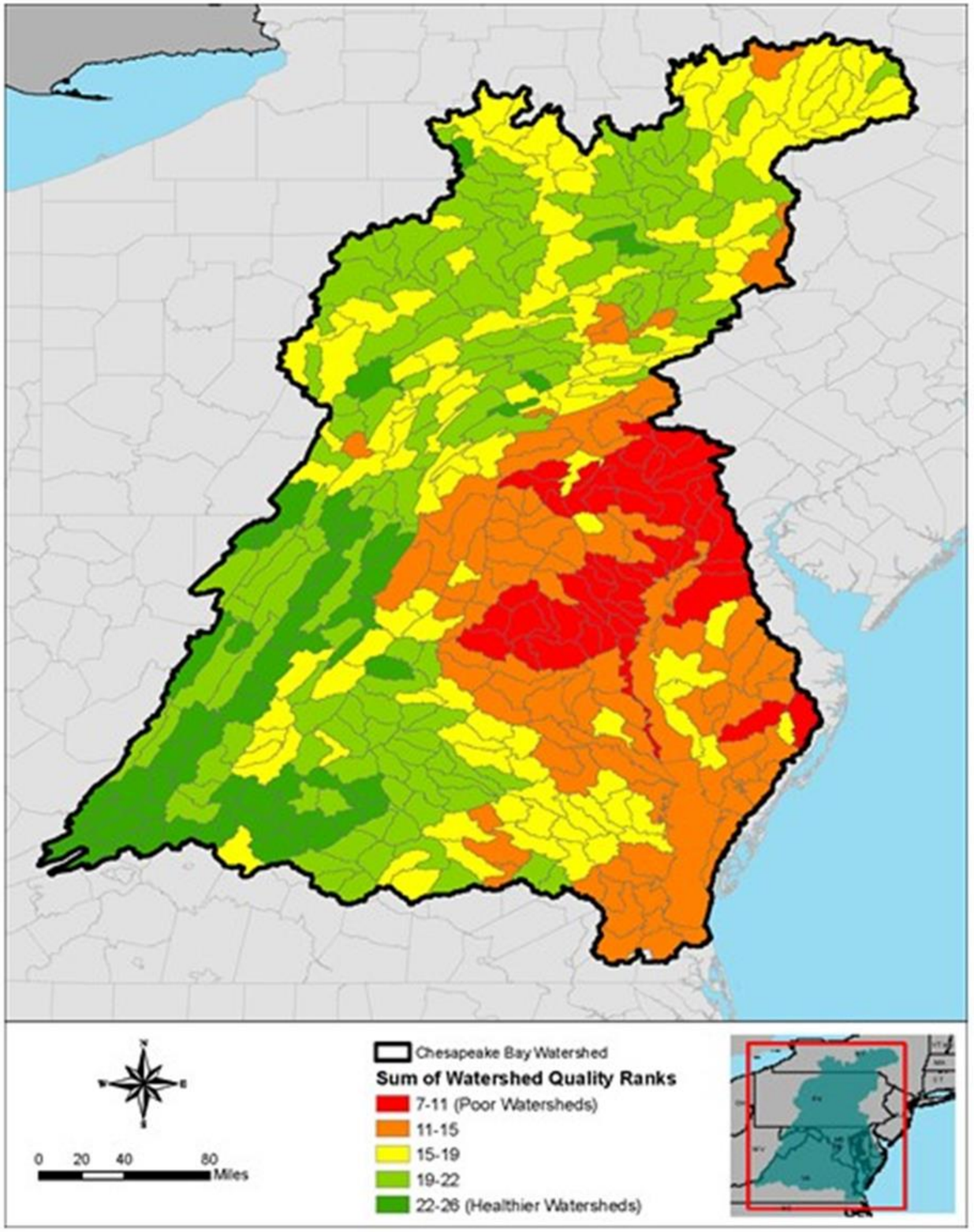
Is there a relevant wetlands metric to incorporate?

WATERSHED DEGRADATION - PROPOSED SCORING SCHEME

Parameter	Data Source	Metric	Scoring	notes for updating for Comp Plan
Landuse (measures of landscape alterations from development)	EPA 2010	Percent impervious cover. Scoring based on relationships established by Center for Watershed Protection (CWP 2003).	0 = >60% 1 = 40-64% 2 = 10-40% 3 = 0-10%	use updated land use?
	EPA 2010	Percent forest cover. Scoring based on goals set and relationships determined in USFS State of Chesapeake Forests (2006)	0 = 0-30% 1 =>30-37 2 =>37-51% 3 = >51	
	EPA 2010	Percent of stream network within subwatershed with forest (riparian buffer). Scoring based on goals set and relationships determined in USFS State of Chesapeake Forests (2006).	0 = 0-56% 1 = >56-63% 2 = >63-70% 3 = >70%	
Stream health- water quality	303(d) Impaired waterways list (EPA)	Stream miles listed as impaired within subwatershed (scoring based on groups determined using Natural Breaks Method (Jenks) in GIS).	0 = 84.64 - 183.33 1 = 34.45 - 84.64 2 = 0.02 - 34.45 3 = 0	use updated layer
Stream health- biological integrity	Chesapeake Bay Program Benthic Index of Biotic Integrity 2000-2010 (watershed-wide B-IBI)	Subwatershed rating assigned by Chesapeake Bay Program based on B-IBI determined by stream monitoring.	0 = NA 1 = poor or very poor 2 = good or fair 3 = excellent	This is latest layer shown on website, but website also states that data will be updated in fall 2016 - http://www.chesapeakebay.net/indicators/indicator/health_of_freshwater_streams_in_the_chesapeake_bay_watershed
Air Quality	Non-attainment zones (EPA)	Yes/no -attainment or non-attainment	0 = non-attainment for both 1 = non-attainment for ozone 2 = non-attainment for PM25 3 = attainment for ozone and PM25	use current listings
Fish Passage	Chesapeake Bay Program Fish Passage Prioritization dataset of blockages (2012)	Number of blockages in a subwatershed (scoring based on groups determined using Natural Breaks Method (Jenks) in GIS).	0 = >51 blockages 1 = 16-51 blockages 2= 1-15 blockages 3 = no blockages	use updated prioritization list from fish passage workgroup (TNC)
Impact of nitrogen loading on water quality (dissolved oxygen) in Chesapeake Bay	Chesapeake Bay Model output- relative effectiveness-nitrogen (EPA 2012)	Overall relative effectiveness (µg/L DO increase per million edge-of-stream nitrogen pound)	1 = 0-1.28 2 = 1.29-3.03 3 = 3.04-5.89	Should we use the Sparrow Incremental Yields instead of these layers?
Impact of phosphorus loading on water quality (dissolved oxygen) in Chesapeake Bay	Chesapeake Bay Model output- relative effectiveness-phosphorus (EPA 2012)	Overall relative effectiveness (µg/L DO increase per 100,000 edge-of-stream phosphorus pound)	1 = 0-0.67 2 = 0.68-2.14 3 = 2.15-4.1	

WATERSHED DEGRADATION

- EXAMPLE MAP



THREATS ANALYSIS

- What areas are threatened by urbanization and climate change in the watershed?
- What areas are prone to increased/persistent flooding in the future?
- Anticipated to include an eroding shoreline analysis, a wetlands migration analysis, North Atlantic Coast Comprehensive Study (NACCS) outputs, storm risks, species migrations, etc.

Pertinent data:

- Eroding shorelines/vulnerable shorelines
- Uncontrolled N and P loads
- Sediment starved wetlands in Bay proper
- CBP – Sea Level Rise threatened areas – NOAA sea level rise viewer and temperature changes (Cross GIT)
- Areas threatened by more frequent normal flooding
- Resources at risk to coastal storms
- Resources at risk to non-tidal flooding
- Tidal marsh migration corridors
- Future projected development – CBP Cross GIT has a layer
- Future conversion of ag lands – CBP Cross GIT has a layer
- National Fish Habitat Assessment (risk of current habitat degradation) – available via CBP Cross GIT

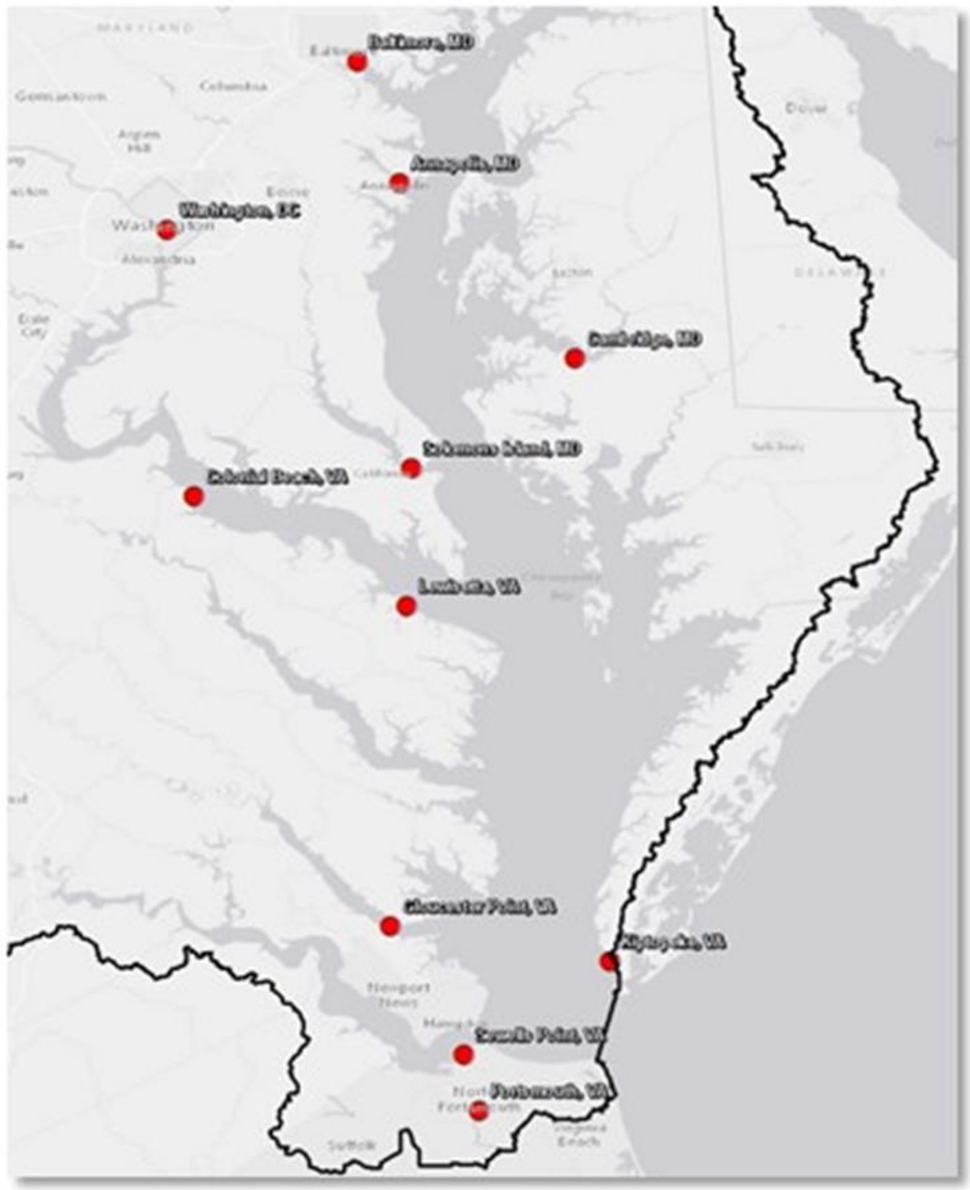
SEA LEVEL CHANGE MAPPING – 2025, 2050, 2100

USACE Sea-Level Change Curve Calculator (2015.46)
http://www.corpsclimate.us/ccaceslcurves.cfm

8638610, Sewells Point, VA
NOAA's Published Rate: 0.01457 feet/yr
All values are expressed in feet relative to NAVD88

Year	USACE Low	USACE Int	USACE High
1992	-0.3	-0.3	-0.3
1995	-0.2	-0.2	-0.2
2000	-0.1	-0.1	-0.1
2005	-0.1	-0.1	-0.0
2010	0.0	0.0	0.1
2015	0.1	0.1	0.3
2020	0.1	0.2	0.4
2025	0.2	0.3	0.6
2030	0.3	0.4	0.8
2035	0.4	0.5	1.1
2040	0.4	0.6	1.3
2045	0.5	0.8	1.6
2050	0.6	0.9	1.8
2055	0.7	1.0	2.1
2060	0.7	1.1	2.4
2065	0.8	1.3	2.8
2070	0.9	1.4	3.1
2075	0.9	1.6	3.5
2080	1.0	1.7	3.9
2085	1.1	1.9	4.3
2090	1.2	2.0	4.7
2095	1.2	2.2	5.2
2100	1.3	2.4	5.6

Print Table



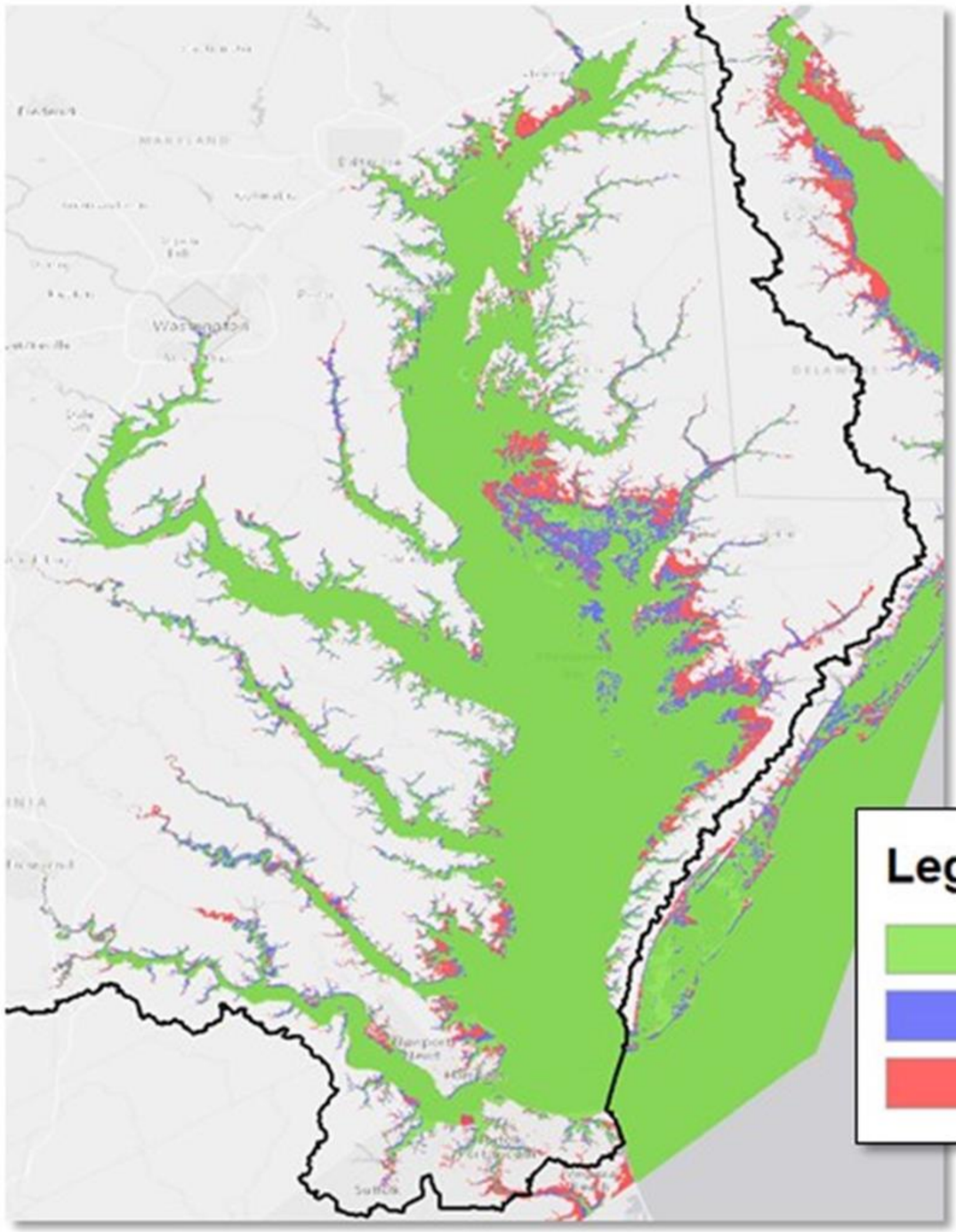
2050 SLC

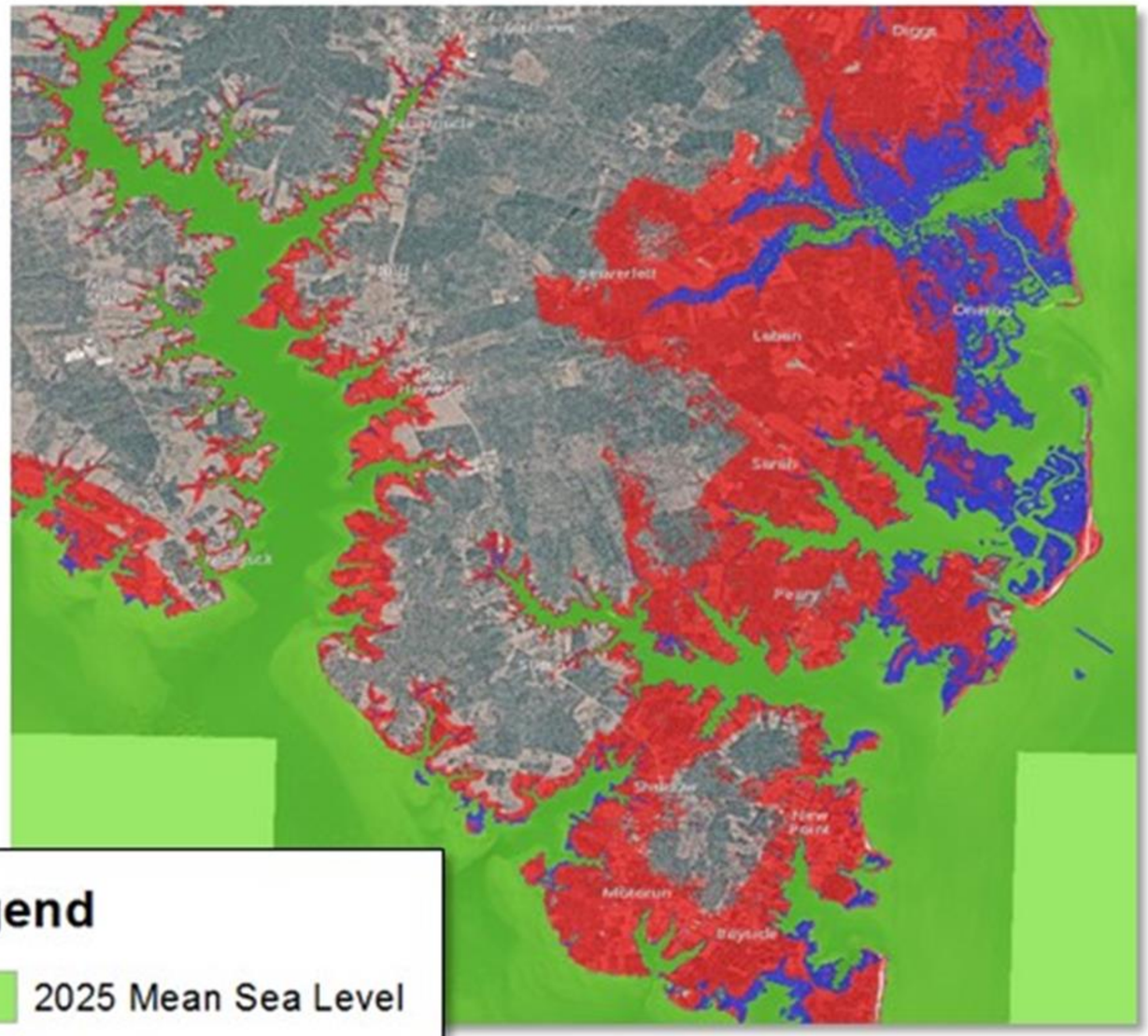
Kiptopeke, VA
1.43’

Annapolis, MD
1.85’

Colonial Beach, VA
2.14’

SEA LEVEL CHANGE MAPPING – 2025, 2050, 2100





Legend

- 2025 Mean Sea Level
- 2050 Mean Sea Level
- 2100 Mean Sea Level

IDENTIFIED PRIORITIES BY OTHERS ANALYSIS

- How do the initiatives of various agencies align? Differentiate between agency priorities for restoration versus conservation.
- What do agency priorities look like spatially?

Agency Priorities – for restoration

- Federal agency prioritized areas – current layers:
  - U.S. Fish and Wildlife Service (FWS) Focus Areas
  - National Oceanic and Atmospheric Administration (NOAA) – Habitat Focus Areas
  - National Fish and Wildlife Foundation – Business Plan Focus Areas
- Ducks Unlimited Focus/Project Areas
- Layers to include that may need to be updated:
  - Natural Resources Conservation Service – Point source and Non-Point Source Priority Agricultural Watersheds (SPARROW modelling)

Agency Priorities – for conservation

- Federal agency prioritized areas
  - Department of Defense Sentinel Landscapes
  - U.S. Department of Agriculture Forest Legacy Areas
- Conservation Fund Focus Areas (need to confirm current)
- The Nature Conservancy Priority Areas

Outstanding questions: Are there additional state priorities to incorporate for consideration? Do any other stakeholders have input to consider?

HEALTHY/HIGH VALUE HABITATS ANALYSIS

- Where are the healthy habitats located in the watershed?

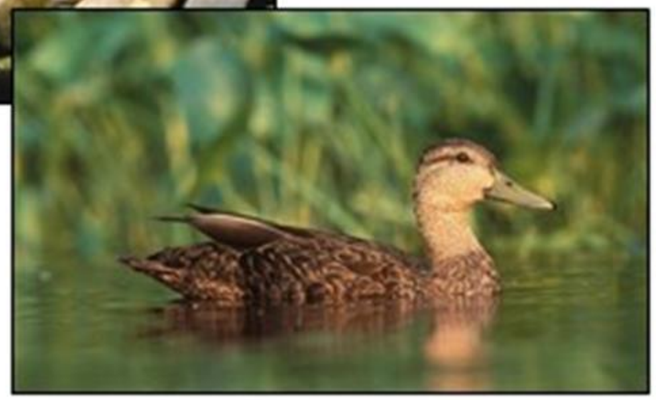
Pertinent data:

- Oyster reefs – potential oyster habitat
- Existing brook trout streams
- SAV beds (existing)
- State-identified healthy watersheds
- Critical rare, threatened and endangered habitats
- Critical habitats determined by RCOA - North Atlantic Landscape Conservation Cooperative
- CBP – Healthy streams and watersheds (good Index of Biotic Integrity (IBI) rating)
- Index of Ecological Integrity - CBP Cross Goal Implementation Team (GIT)
- Chesapeake Conservation Partnership Forest Model - riparian buffer data and large forest tracks component
- High value forests
- Audubon Important Bird Areas
- RCOA Cores and Connectors
- Nesting locations of wading and waterbirds
- Black Duck Focus Areas

Outstanding questions:
There is a data layer on critical watersheds for freshwater species available for a fee.
Is this critical information?

RESTORATION OPPORTUNITIES ANALYSIS – EXAMPLE

Question H1 - How do habitats targeted individually by the 2014 Bay Agreement align comprehensively on the landscape?



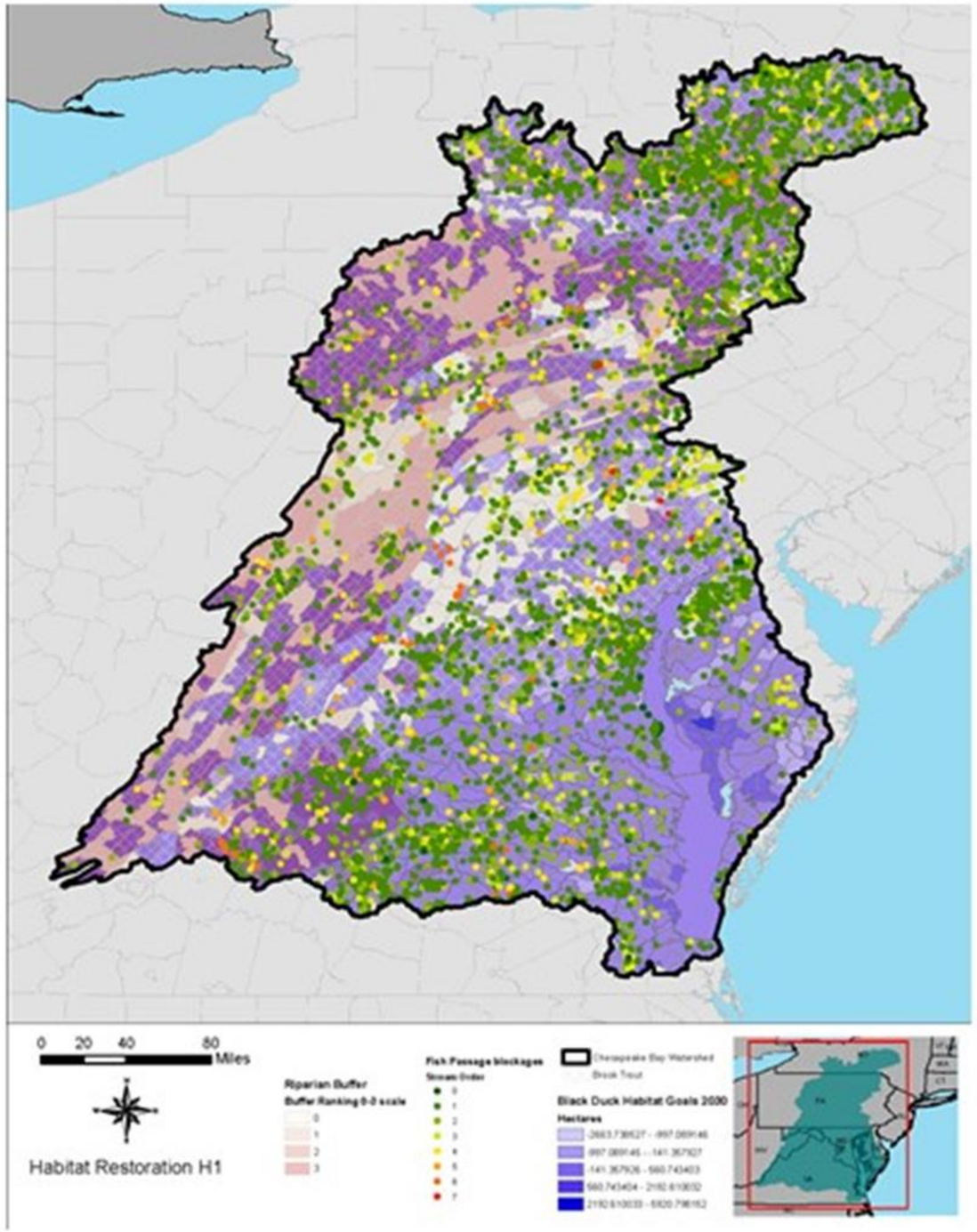
- Brook Trout
- Black Duck
- Forested riparian habitats
- Fish passage

How do these spatial plans relate to implemented projects/initiatives by the workgroups?

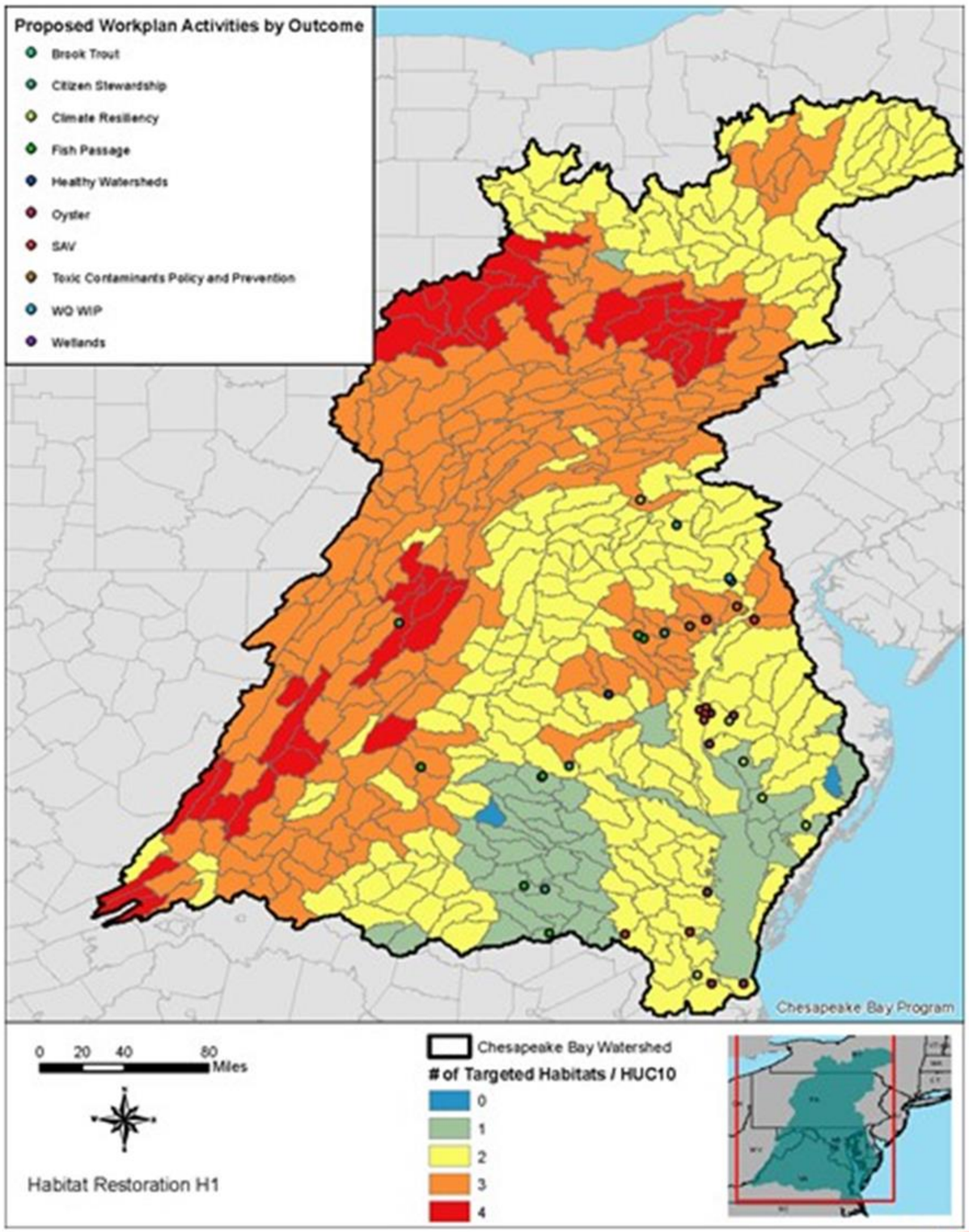
Outstanding questions: Are there any other targeted habitats with geospatial plans?

RESTORATION ANALYSIS – DRAFT ANALYSES

HOW DO HABITATS TARGETED INDIVIDUALLY BY THE 2014 BAY AGREEMENT ALIGN COMPREHENSIVELY ON THE LANDSCAPE?

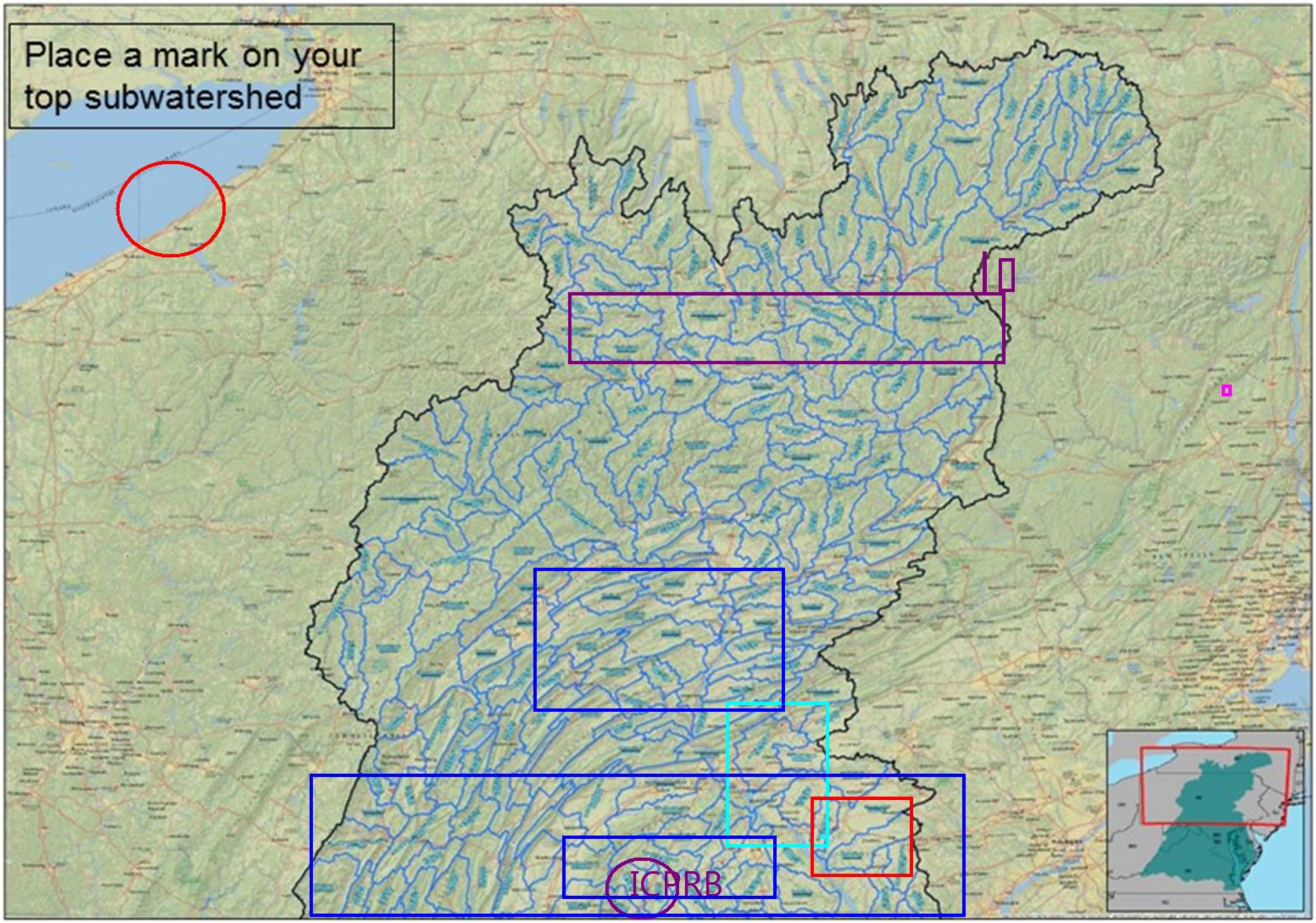


H1 ANALYSIS

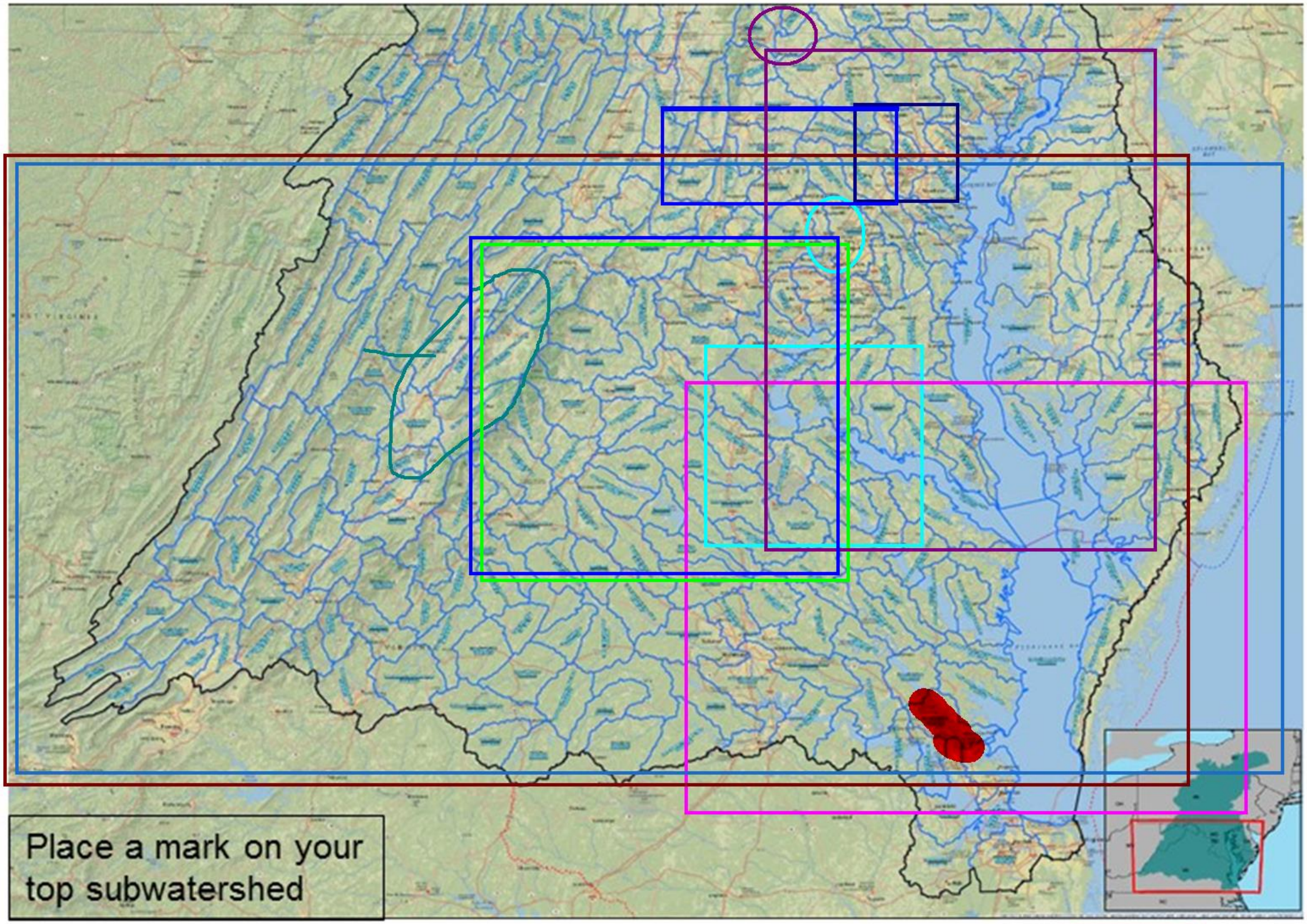

Proposed Workplan Activities by Outcome
Brook Trout
Citizen Stewardship
Climate Resiliency
Fish Passage
Healthy Watersheds
Oyster
SAV
Toxic Contaminants Policy and Prevention
WQ WIP
Wetlands
Chesapeake Bay Program
0 20 40 80
Miles
Habitat Restoration H1
Chesapeake Bay Watershed
# of Targeted Habitats / HUC10
0
1
2
3
4


Q
&
A

SUBWATERSHED SCREENING - UPPER BAY



SUBWATERSHED SCREENING - LOWER BAY



IMPLEMENTATION BARRIERS TO RESTORATION

Write roadblocks in chat box in this format:
Agency: Roadblock/Explanation

POLL

Where can USACE support your agency to assist in meeting the Chesapeake Bay Watershed Agreement goals?

- Please select two choices in the poll.
- If you have “other” specific ideas, check “other” in the poll and use the chat box to identify the other specific idea.

DATA CALL

#1 Restoration Actions

Recently implemented or about to be implemented environmental/ecosystem restoration projects and/or programs.

USACE

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Restoration Actions

Data Request Form

*Please submit only one program/project per page.

*Please submit in any of the following ways:
Email: ChesBayCompPlan@usace.army.mil
Email: anna.m.compton@usace.army.mil

Additional forms can be downloaded from the study website:
http://www.nab.usace.army.mil/Missions/Civil-Works/Chesapeake-Bay-Comprehensive-Plan/

We are requesting GIS data in Esri shapefile or geodatabase format. Points, lines, or polygons are acceptable but the more detail the better. If the requested info is not already documented in the GIS attribute table or metadata, please fill out the form below to accompany the GIS data.

Background- There is A LOT of good work going on in the Chesapeake Bay watershed. One our charges for the CBCP effort is to ensure that we are **adopting** and **aligning** with the good work going on in the Bay. We know there is a lot of recently implemented or about to be implemented environmental/ecosystem restoration projects and/or programs; however there is no ONE good place to get this data. The data we collect will be used to create a data layer/database of "Restoration Actions" with corresponding map(s). This would be shared and could be utilized for collaboration purposes and for future planning efforts.

1. Project/Program Name/Type-
2. Affiliated with a larger federal, state, or local restoration plan/strategy?-
3. Project Status-
4. Project area/location- (Lat/long or map location preferable)-
5. Anticipated ecological benefits-
6. Point of Contact (Name, email, phone number, agency)-
7. Other Information-

http://www.nab.usace.army.mil/CBCP_data_request/

DATA CALL

#2 CANDIDATE RESTORATION PROJECTS

- Projects with minimal risk and uncertainty that can be implemented without further research, complex modeling or data collection to achieve immediate, meaningful environmental benefits to the Chesapeake Bay.
- Indicate higher priority projects.
- USACE is looking to identify strategic partnerships and funding sources to implement recommendations (i.e. projects).

http://www.nab.usace.army.mil/CBCP_data_request/

USACE

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Candidate Restoration Project

Data Request Form

*Stakeholders are welcome to submit more than one project. Please submit only one project per page.

*Please submit in any of the following ways:

Email: ChesBayCompPlan@usace.army.mil

Email: anna.m.compton@usace.army.mil

Additional forms can be downloaded from the study website: http://www.nab.usace.army.mil/Missions/Civil-Works/Chesapeake-Bay-Comprehensive-Plan/

We are requesting GIS data in Esri shapefile or geodatabase format. Points, lines, or polygons are acceptable but the more detail the better. If the requested info is not already documented in the GIS attribute table or metadata, please fill out the form below to accompany the GIS data.

Background- One of the end products of the CBCP is to recommend AT LEAST one ecosystem restoration project per Bay state that USACE could partner with a non-federal agency to implement. We are looking for projects with minimal risk and uncertainty that can be implemented without further research, complex modeling or data collection to achieve immediate, meaningful environmental benefits to the Chesapeake Bay. The collected data will screened and used to identify strategic partnerships and funding sources to implement recommendations (i.e. projects).

1. Project Name/Type-
2. Potential project area/location (Lat/long or map location if available) -
3. Anticipated ecological benefits-
4. Estimated Cost range-
5. Implementation barriers (Funding? Controversy?)-
6. Point of Contact (Name, email, phone number, agency)-
7. Other Information-

DATA CALL

Data Request Forms

Submit only one program/project per page.

Submit in any of the following ways:
Email: ChesBayCompPlan@usace.army.mil
Email: anna.m.compton@usace.army.mil

Due by March 7, 2017

NEXT STEPS

- Data calls due March 7
- U.S. Fish and Wildlife Service Planning Aid Report - late March
- Stakeholder webinars - April and June
- Draft Report for review – Fall 2017
- Final Report - Summer 2018


Thank you for participating in the webinar!