Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 1: Participant List

**(Names listed in Italics were invited but did not attend)*

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Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 2: Stakeholder Workshop Agenda

(see following 2 pages)

Chesapeake Bay Comprehensive Water Resources and Restoration Plan
Stakeholder Workshop
November 7, 2016
Maryland Department of the Environment
1800 Washington Blvd, Baltimore, MD, 21230

Workshop Objectives:

1. Identify Chesapeake Bay water resources and restoration needs USACE and others could address; discuss and prioritize actions USACE and others should undertake that will contribute the most to Chesapeake Bay restoration efforts;
2. Coordinate the Chesapeake Bay Comprehensive Plan (CBCP) with the actions of the Chesapeake Bay Program; Consider and avoid duplication of any ongoing or planned actions of other federal, state, and local agencies and non- governmental organizations;
3. Review planned geospatial analyses and identify additional sources of information or references (datasets, reports, plans), especially geospatial datasets, to incorporate into the CBCP's geospatial analyses that will be used to inform the study.

Agenda

8:00 – 8:30	Registration	
8:30 – 8:45	Welcome	Amy Guise Jake Reilly

8:45 - 9:45	• Workshop Purpose, Agenda Review, Logistics
	• Chesapeake Bay Comprehensive Water Resources and Restoration Plan Overview Presentation
	  o Review of Corps Authorities/Missions
	  o GIS overview - purpose & summary of data
	• Q & A
		Seth Cohen
		Dave Robbins
		Jason O'Neal

9:45 – 10:00	Break	
10:00 - 11:15	Session 1 • Identify existing or planned actions by topic, add anything missing • Identify existing sources of information or references, especially geospatial data	Table discussions 3 20-min conversations, choose your topics*
11:15 -12:45	Working Lunch – Map Review • Review & Refine table discussion maps	All

Agenda

12:45 – 2:00	Session 2 • Review edits from Lunch • What additional actions should the USACE or others take? What are the gaps and which organization is best placed to address them?	Table discussions 3 20-min conversations, choose your topics*
2:00 – 2:15	Break	
2:15 – 3:00	Session 3 • Prioritize USACE and others' actions	Plenary activity
3:00 - 4:00	Presentations by each table on their top priorities for USACE and others – Q&A/Comment	Plenary presentations
4:00 – 4:30	Recap, Discussion of Shared Vision, and Path Forward	Seth Cohen Dave Robbins
4:30 pm	Adjourn	

***Table Discussion Topics**

1. Climate Change

2. Ecosystem Restoration (including water quality BMPs, land conservation, water supply - ecological and consumptive use, restoration actions (Watershed Implementation Plans, Chesapeake Bay Program Management Strategies, Biennial Workplans)

3. Riverine and Coastal Flood Risk Management

4. Regional Sediment Management and shoreline erosion/stabilization actions (including navigation and beneficial use of dredged material)

5. Public access to, and educational/stewardship opportunities for, USACE projects

6. Policy Needs and Implementation Barriers

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 3: Stakeholder Workshop Slide Presentation

(see following 18 pages)

CHESAPEAKE BAY COMPREHENSIVE WATER RESOURCES AND RESTORATION PLAN

STAKEHOLDER WORKSHOP

November 7, 2016

"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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WORKSHOP PURPOSE AND OBJECTIVES

Purpose: Agency coordination and early input

Objectives:

- Identify problems and opportunities
- Identify gaps in implementation
- Avoid duplication of others
- Identify geospatial data and other information

TABLE DISCUSSIONS

- Session 1:
  - Identify existing or planned actions by topic
    - What are other sources of information regarding completed and planned restoration actions?
- Session 2:
  - What and where are the gaps?
    - Are there obvious organizations or entities that might be best to take the lead to address the gaps?
- Session 3:
  - Initial prioritization discussions
    - Cost/benefit
    - Temporal
    - Spatial

Table Discussion Topics
1. Climate Change
2. Ecosystem Restoration and Water Supply
3. Flood Risk Management
4. Regional Sediment Management
5. Public Access
6. Policy Needs and Implementation Barriers

TODAY'S DESIRED OUTCOME

- Confirm the shared vision statement
- Define ongoing activities or sources of information related to your agency's activities
  - Geospatial data
- Identify gaps
  - CBCP value added

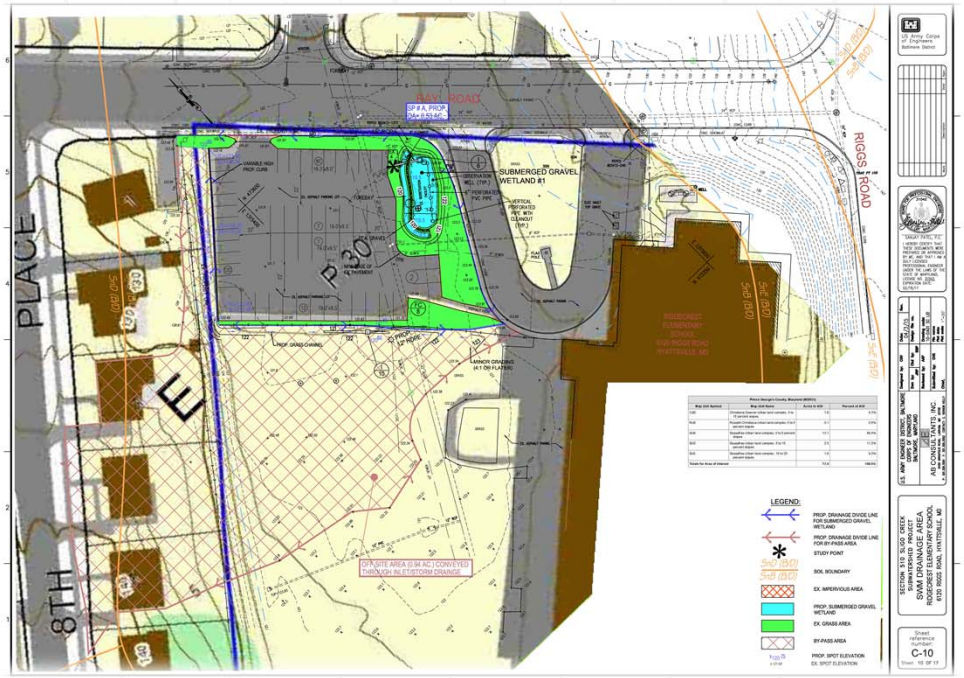
OVERVIEW

- Study Overview and Background
- Geospatial Analyses
- Prioritization and Sequencing Actions
- Products
- Milestone Schedule
- Next Steps and Path Forward

STUDY OVERVIEW AND BACKGROUND

- Two-year study
- National Fish and Wildlife Foundation is the non-Federal sponsor
  - Cost-Sharing Agreement signed July 22, 2016
- Defined role for USACE, integrated with work by others
  - Section 510 (design/build authority)
  - Technical Services (Floodplain Management Services/Planning Assistance to States, adaptation planning)
  - Support to other Federal agencies and DoD
  - Continuing Authorities Program
  - General Investigations Feasibility Studies
  - Research recommendations

SECTION 510 DESIGN/BUILD



Section 510 Projects
1. Ecosystem Restoration
2. Beneficial Use of Dredged Material
3. Projects that May Enhance the Living Resources

Sligo Creek Bioretention Design and Construction
- Prince George's County
- Ridgecrest Elementary School

FLOODPLAIN MANAGEMENT SERVICES PROGRAM

Types of Analyses

Non-structural flood-proofing studies

- Flood modeling (hydrologic and hydraulic)
- Floodplain mapping
- Flood/Hurricane preparedness and response plans
- Flood hazard vulnerability analysis
- Flood damage reduction studies
- Flood warning systems
- Dam break analyses
- Anything related to flooding!

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PLANNING ASSISTANCE TO STATES PROGRAM

Types of Analyses

All flood-related studies including non-structural flood proofing

- Geographic Information System (GIS) mapping
- Stormwater assessments
- Stream assessments
- Sanitary sewer (wastewater) studies
- Water supply and demand
- Water system vulnerability assessments
- Surface and groundwater quality
- Environmental restoration
- Wetland delineations
- Watershed planning
- Anything related to water!

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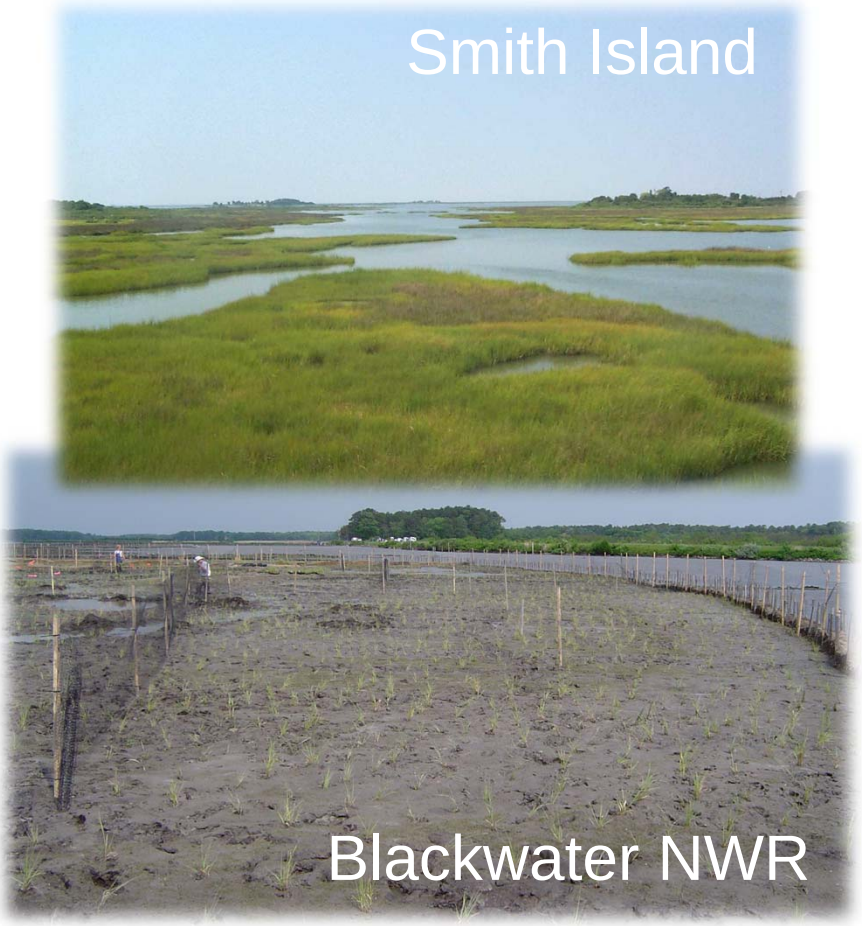
STUDY OVERVIEW AND BACKGROUND (CONT.)

CBCP will:

- Be a roadmap for implementation of projects
- Identify USACE actions
- Identify projects to be implemented, including at least one for each state and the District of Columbia

GEOSPATIAL ANALYSES

- Inventory and Forecast Conditions (HUC 10 Subwatersheds)
  - Existing Conditions
    - Numerous sources of information
  - Forecast future conditions planning horizons to 2025, 2050, and 2100
    - Projects planned through 2025 using available information, which corresponds to the Chesapeake Bay EO 13508 and conclusion of Phase III of the TMDL effort
    - Semi-quantitative analyses to forecast future conditions to 2050 and 2100
    - Analyses of SLC for the Chesapeake Bay adopted from the NACCS SLC analyses (EC 1165-2-8162)



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GEOSPATIAL ANALYSES (CONT.)

- Problems and Needs
  - Areas that require restoration actions
    - Conversely, areas that would benefit from conservation actions
  - Flood risk and water supply
  - Navigation
  - Military Installations
- Identify Measures
  - Best management practices
  - Policy and programmatic
- Formulate Strategies
  - Conservation vs. restoration
- Recommendations
  - Findings, Outcomes, and Opportunities

PRIORITIZATION AND SEQUENCING ACTIONS

What would be the appropriate timing and sequence of actions:

- Based on current benefit to cost
  - What are those projects that provide the greatest benefits based on incremental costs?
    - Wastewater treatment plants for example
- Spatial
  - Closer to the Bay proper?
- Conservation vs. restoration
- Timeframe for implementation
  - Watershed actions (i.e., stormwater and agricultural) vs. habitat restorations
    - Concurrent actions at a smaller scale

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PRODUCTS

CBCP Report

- Report Delivered to Congress for Information
  - Watershed Assessment
    - Geospatial Analyses of Bay
    - Restoration Progress, Policies, and Programs
    - Problems and Needs
    - Findings, Outcomes, and Opportunities
      - » USACE actions
      - » Others
    - Funding Strategy
  - State and District of Columbia Appendix
    - Results of Geospatial Analyses
      - » HUC 10 subwatersheds
    - Findings, Outcomes, and Opportunities
  - Geospatial Data
    - Derived Datasets

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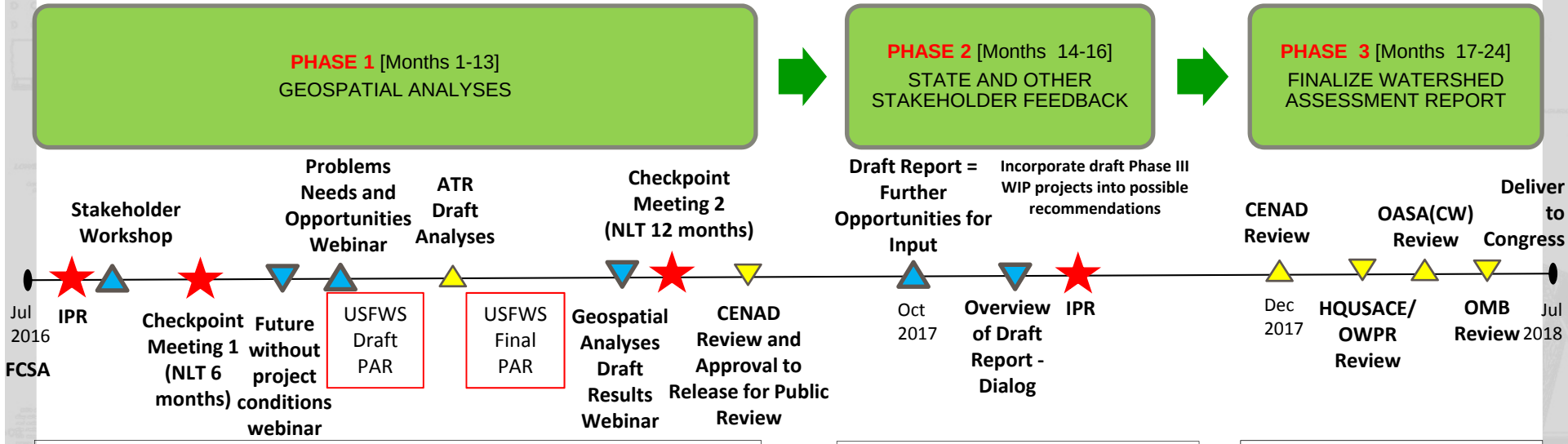
MILESTONE SCHEDULE

Chesapeake Bay Program
Management Strategies and Action Plan Synchronization

State Draft Phase III WIPs 2017-2018



PHASE 1 [Months 1-13]

1. Vertical team IPR (8/8/2016)
2. Interagency watershed planning collaboration workshop (11/7/2016)
3. Data collection
4. Existing and future conditions forecast/geospatial analyses
5. Coordinate and synchronize Chesapeake Bay Program management strategies and biennial workplans
6. Vertical team IPR – Checkpoint Meeting 1 (Shared Vision Milestone)
7. Review Draft USFWS PAR
8. Complete geospatial analyses
9. ATR draft geospatial analyses
10. Stakeholder webinar
11. Vertical team IPR – Checkpoint Meeting 2 (Recommendations Milestone)
12. Draft report preparation
13. District quality control and sponsor/state POC reviews
14. CENAD review and approval to release for public review

PHASE 2 [Months 14-16]

1. Release draft report for state, other stakeholder, and public review
2. Respond to comments
3. Incorporate latest information related to draft Phase III watershed implementation plan data
4. Final report preparation
5. District quality control and sponsor/state POC reviews
6. Vertical team IPR – comment/response

PHASE 3 [Months 17-24]

1. CENAD review
2. Comment response
3. HQUSACE/OWPR review
4. Comment response
5. OASA(CW) review
6. Comment response
7. OMB review
8. Comment response
9. HQUSACE Chief, Planning and Policy approval
10. HQUSACE RIT coordinates with OASA(CW) delivery of final report to Congress

= USACE Vertical Team Integration Action
= USACE Reviews
= Stakeholder Collaboration Opportunity

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QUESTIONS?

TABLE DISCUSSION SESSIONS

Table Discussion Topics
1. Climate Change
2. Ecosystem Restoration and Water Supply
3. Flood Risk Management
4. Regional Sediment Management
5. Public Access
6. Policy Needs and Implementation Barriers

NEXT STEPS AND PATH FORWARD

This is the first of several discussions and coordination activities for the study:

- Stakeholders and Proposed Collaboration
- Shared Vision Confirmation
- Characterize Existing and Future Forecasted Conditions
- Define Problems, Needs, and Opportunities
- Refine Goals and Objectives

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 4: Data Inventory Handout

(see following 2 pages)

Chesapeake Bay Comprehensive Plan Data Inventory

	DATA THEME / CATEGORY	DATA DESCRIPTION	SUB-CATEGORY	DATA OBTAINED?	DATA LOCATION
Data Layers Identified in Project Management Plan (PMP)	**Boundaries**	Jurisdictional boundaries		YES	
		(HUC)10 Watershed boundaries		YES	
	Landuse/Land cover	Land use within Chesapeake Bay watershed		YES	
		Percent impervious cover		YES	
		Percent forest cover		YES	
		Percent forested riparian buffer			
		Wetlands		YES	
		Soils		YES	
		Shoreline structure			
		NOAA ESI Shoreline Classifications		YES	
		USGS Coastal Vulnerability Index		YES	
	Streams	Stream network		YES	
		Stream order			
		Impaired streams on 303(d) List		YES	
		Stream health			
	Habitats	Submerged aquatic vegetation (SAV)		YES	
		Historic oyster reef habitat			http://www.fishhabitattool.org
		Fish passage blockages		YES	
		Diadramous and resident fish habitat		YES	
		Vulnerable shorelines			
		Eastern Brook Trout			
		Black Duck			
		Primary migration pathways			
		Designated Use			
		Nesting locations of wading and waterbirds		YES	
	Air Quality	Zones for ozone and PM25			
	Chesapeake Bay Model Data	Overall relative effectiveness of nitrogen			
		Overall relative effectiveness of phosphorus			
		SPARROW Nutrient Yield (GIT)			
	Land conservation, preservation, and easements	Chesapeake Bay protected and conserved lands			
	Projects/Prioritized work within the Chesapeake Bay	Existing USACE ecosystem restoration, flood risk management			
		Other Federal agency prioritized areas			
		NFWF Business Plan Focus Areas			
		State prioritized watersheds/areas			
		TNC priority areas			
		Chesapeake Bay Program Habitat GIT priority areas identified through Management			
		Priority Living Resource Areas (GIT) - Water column			
		Priority Living Resource Areas (GIT) - bottom habitats			
		Strategies for Eastern Brook Trout, Fish Passage, Black Duck, etc. Other GITs may have			
		High vulnerability to coastal storm damages			
	Management Strategies Priorities	10 Tributaries for Oyster Restoration			
		Prioritized List of Fish Passage Blockages			
		Black Duck prioritized restoration areas			
		Brook Trout prioritized subwatersheds			
		Riparian Forest Buffer Priority Areas			
		Tree Canopy Assessments			
		Areas of greatest SAV restoration need (?)			
		State-identified healthy watersheds			
		American States Utility Service			
	Implemented Projects	USACE implemented projects		YES	
		State and local gov't implemented projects			
		TMDL/WIP implemented projects			
		NGO implemented projects			
		Other Federal agency implemented projects			
	Planned Projects	USACE planned projects		YES	
		State and local gov't planneded projects			
		TMDL/WIP planned projects			
		NGO planned projects			
		Other Federal agency planned projects			
		NFWF priority subwatersheds			
		USFWS areas		YES	
		MS4 areas			
		NRCS priority watersheds			
		Priority agriculture watersheds			
		Conservation priorities			
		Forest legacy areas			

	Agency Priorities	Water quality protection areas			
		Critical habitat for RTE			
		Critical watersheds for freshwater species			
		State priority watersheds			
		State Wildlife Action Plan conservation areas			
		Important bird areas		YES	
		Connectivity of land cover			
		Chesapeake Bay Eco Network			
	Healthy Areas	NRCS Showcase watersheds			
		High value forests			
		State designated healthy watersheds			
		TNC Priority Conservation Areas		YES	
		Protected Lands- Federal and State Parks		YES	
		Unprotected heathly watersheds (GIT)			
		Streams/watersheds with 'good' IBI rating			
	Vulnerable Areas	Resources sensitive to climate change			
		Resources threatened by urbanization			
		Resources at risk to coastal storms			
		Vulnerable shorelines			
		Areas impaired by PCBs (GIT)			
		SLR threatened areas (GIT)			
		National Fish Habitat Inland Assessment (GIT)			
	Habitat- Historical And Existing	Historic and current extent of anadromous fish		YES	
		Historical and current SAV habitat		YES	
		Historical and current oyster habitat			
		Historical and current brook trout habitat plus energetics model (GIT)			
		Wetlands?		YES	
		Historical and current remote island habitat			
Additional Data Sources Identified by Project Delivery Team Members		Fish habitat tool	Fish habitat tool		http://www.fishhabitattool.org
		Map Layer inventory	Map Layer Inventory		http://www.landscope.org/chesapeake/
		SAGE Searchable Project Database - Classification Scheme			
		physiographic provinces			
		new national hydrography datasets (NHD)			USGS-Roger Barlow
		North Atlantic Landscape Conservation Cooperative			Northatlanticlcc.org
		Protected Areas Database (PAD-US)			http://gapanalysis.usgs.gov/padus/viewer/
		State GIS Clearinghouses-VA			VA: http://vgin.maps.arcgis.com/home/
		State GIS Clearinghouses-MD			MD: http://data.imap.maryland.gov/
		State GIS Clearinghouses-DE			DE: http://opendata.firstmap.delaware.gov/
		State GIS Clearinghouses-WV			WV: http://wvgis.wvu.edu/data/data.php
		State GIS Clearinghouses-PA			PA: http://www.pasda.psu.edu/default.asp
		State GIS Clearinghouses -NY			NY: https://gis.ny.gov/gisdata/
		State GIS Clearinghouses-DC			DC: http://opendata.dc.gov/
		Northeast Climate Science Center			https://necsc.umass.edu/projects/determining-skill-and-value-incorporating-streamflow-forecasts-early-drought-detection-syst
		Northeast Climate Science Center			https://necsc.umass.edu/
		Land Use/Land Cover			\\nao-fs-im16.nao.ds.usace.army.mil\world\usa\landcover\Chesapeake_Bay_Watershed
		Methods for Estimating Past, Present, and Future Developed Land Uses in the Chesapeake Bay Watershed:			ftp://ftp.chesapeakebay.net/Modeling/Upload/Administrative_Record_Non-model_Files/21_Model%20Documentation%20and%20Independent%20Scientific%20Reviews/21_033_Phase%205%203%20Land%20cover%20Land%20use%20Methods8910.pdf
		Freshwater resilience			http://nalcc.databasin.org/
		Landscope			www.landscope.org\chesapeake
		CBCP - VOSARA Data			http://cmap2.vims.edu/arcgis/rest/services/VOSARA/vosaraDataLayers/MapServer
		Envision the Susquehanna			http://envisionthesusquehanna.org/
Additional Data Layers from the Chesapeake Bay Plan (CBP)		Priority Living Resources Areas (surrogate for Fish Habitat)	GIT 1 Conservation		list in Habitat Requirements for Chesapeake Bay living Resources, Second Edition (1991)
		Oyster Restoration Areas	GIT 1 Restoration		list in Habitat Requirements for Chesapeake Bay living Resources, Second Edition (1991)
		National Fish Habitat Action Plan (risk of current habitat degradation)	GIT 1		National Fish Habitat Partnership
		Regional Conservation Opportunity Areas	GIT 2 Conservation		
		Index of Ecological Integrity (NALCC)	GIT 2 Conservation or Restoration		
		Brook Trout	GIT 2 Conservation		
		Black Duck Energetics Model	GIT 2 Conservation?		
		SPARROW Nutrient Loads	GIT 3 Restoration		
		Waters Impaired for PCBs	GIT 3 Restoration		
		Long Term WQ Monitoring Trends	GIT 3 Restoration		
		Water Quality Standards Attainment	GIT 3 Restoration		
		Healthy Watersheds	GIT 4 Conservation		
		Protected Lands	GIT 4 Protection Overlay		
		Public Access	GIT 5 Conservation		
		Land Protection Priorities (via Chesapeake Conservation Partnership)	GIT 5 Conservation		http://www.chesapeakeconservation.org/?page_id=1311
		Sea Level Rise/Inundation	Climate Threat		https://coast.noaa.gov/digitalcoast/tools/slr
		Flood Hazard Risk (riverine)	Climate Threat		
		Wetland Adaptation Areas	Climate Threat/ Conservation		
		High Poverty	Diversity		EPA's EJScreen Platform
		Ethnic Minority	Diversity		EPA's EJScreen Platform
		Public Health Indicator ((e.g. cancer rates, asthma, birth defects))	Diversity		
		CB Land Change Model	Land Change Threat		

Chesapeake Bay Comprehensive Water Resources and Restoration Plan
Attachment 5: Identified Data and Information Sources

Ecosystem Restoration

- North American Waterfowl Management Plan, Waterfowl Priority Areas.
    - Data can be provided by USFWS, Atlantic Coast Joint Venture, or Division of Bird Habitat Conservation
- Black Duck Decision Support Tool: identifies black duck priority areas in the Chesapeake Bay watershed.
    - Data not publically available yet
    - Data can be provided by Black Duck Joint Venture
    - Flyways Data information can be provided by USFWS, Division of Bird Habitat Conservation
- NOAA
    - Habitat Prioritization Tool (NOAA-TNC)
    - Oyster Geodatabases for tributary restoration
    - Coastal Change Analysis Program data
    - Chesapeake Bay Interpretive Buoy System (10 buoys providing real time observations)
- USGS: Nutrient and Sediment Monitoring
    - Fish health and stream studies in PA
    - Wetland studies to support black ducks
    - Brook trout populations and effects of stream conditions
- USFWS
    - Partners for Fish and Wildlife HABITS database
- DC Government
    - Stream restoration work/overall restoration work
    - Toxics study/ wildlife restoration
    - Watershed Resources Registry (WRR) – completed for Maryland, underway for Pennsylvania, Virginia, Delaware, and West Virginia
- Maryland DNR
    - Non-point source BMPs implemented and planned, and Atlantic Coastal Bays Trust Fund
    - Shoreline Restoration Program implemented and planned (410.260.8719)
- Systems Approach to Geomorphic Engineering (SAGE) database – repository of restoration projects
    - POC: Pam Mason (VIMS), Karen Duhring (VIMS) and Bradley Watson (CSO)
- Chesapeake Fish Passage Tool (POC: Mary Andrews, NOAA)
- Chesapeake Habitat Restoration Tool (tidal and wetlands) (POC: Mary Andrews, NOAA)
- The Conservation Fund
    - Ongoing effort to map green infrastructure (NNBF) in the greater Baltimore region (watersheds of the Gunpowder, Patapsco and upper & middle Patuxent and associated smaller watersheds and western Bay shoreline zone) to identify existing GI network and analyze opportunities to improve protection, enhance, restore or add green

infrastructure elements spanning the spectrum from storm water management BMPs to natural area "hubs" and cores for wildlife (Word document attached).

    - For the map viewer: http://resiliency.cicapps.org/coastal-resiliency/resiliency-maps/
    - For USGS analysis of stream gage information in our study area; http://md.water.usgs.gov/projects/tech_appendix/index.html
    - For APA community action plans (local studies): https://www.planning.org/nationalcenters/green/gbwc/
- Healthy Watershed Initiative
    - West Virginia (partially) and TNC analysis at HUC 12 down to catchment
    - In addition there is a 2015 State Identified Healthy Waters and Watersheds dataset that that may be relevant.

POC: Renee Thompson (Coordinator, Maintain Healthy Watersheds GIT)

Regional Sediment Management

- Coastal Systems Portfolio Initiative (CSPI) (USACE)
- Virginia Department of Environmental Quality (DEQ) Coastal Geospatial and Educational Mapping System (GEMS)
- Maryland DNR Coastal Atlas
- Systems Approach to Geomorphic Engineering (SAGE) database (VIMS)
- State Coastal Management Programs (Coastal States Organization can coordinate data/info collection)
- Sediment-bound Contaminant Resiliency and Response Strategy
    - USGS project to tract sediment board contaminants (cwright@chesapeakebay.net)
- Regarding existing watershed-based plans for streams (~ HUC 12) impaired by sediment, we would have to create a layer but it would be straightforward.
- Local Impairment Mapping – mapping application that illustrates state designated local impairment by type of impairment from 2014 Integrated Water Quality reports (i.e. shows location of pathogens, sediment, PCB, mercury, etc. impairments) (cwright@chesapeakebay.net)
- Not sure if this data is available but heard it was in the works…USGS sediment source mapping in PA, to discern legacy sediments vs. upland sources (like agriculture)
- USACE Norfolk District Dredged Material Placement Sites/ Federal Navigation Channel Data (Jason has this)
- Sediment sources in urban and agricultural areas – several areas in watershed (Scott Phillips, USGS), others:
    - PCBs and Sediment
    - Sediment Monitoring
    - SLR and Effects on Coastal Sediment (studies of wetlands and black duck habitat)
- VIMS
    - Shoreline Evolution Data (POC: Scott Hardaway, hardaway@vims.edu)
    - Shoreline Inventory (POC: Marcia Berman, marcia@vims.edu)
- Maryland Department of Natural Resources

    - MD Trust Fund Project Inventory (POC: Matt Fleming)
    - Maryland Waterway Improvement Program/ Dredging (POC: Matt Fleming)
    - MD Shoreline Conservation Projects funded through MD SEC program (POC: Matt Fleming)

Flood Risk Management

- Too numerous to list, but I have a database I can send. State and Chesapeake Bay –wide (contact Bryson.ellen@epa.gov)
- Maryland Coastal Atlas/coastal resiliency (MD DNR website)
- NFWF, USACE, NOAA: Community Risk Assessment (contact: Jake Reilly)
- Fish Passage/Dam Removal Prioritization Tool: CBP habitat (It is a TNC tool, contact: Erik Marten)
- Coastal Resiliency Assessment: community flood risk areas (Maryland iMap and Coastal Atlas – MD DNR)
- VIMS Estuarine Hydrodynamic Modeling Group (contact: Derek Loftis)
- National levee database (Silver Jackets website: nab.usace.army.mil (factsheets, project information in Baltimore District, by state or mission area)
- North Atlantic Aquatic Connectivity Collaborative (NAACC) – funded via North Atlantic Landscape Conservation Cooperative; assesses culverts across NE (including Chesapeake Bay watershed) for fish habitat and flood risks; identifying and prioritizing culverts in need of replacement
    - portal@naacc.org (?)
- Healthy Watershed Initiative
    - West Virginia (partially) and TNC analysis at HUC 12 down to catchment
- Watershed Resources Registry (WRR)
    - Five states; R2 entire state analysis complete or underway (D.C. excluded)
- Repetitive Loss Area's identified for Morgan, Berkeley and Jefferson counties
    - West Virginia Department of Homeland Security (*Data agreement/ sharing agreement may be required*)
- Sediment Contaminant Resiliency and Response Program (SCoRR)
    - Watershed-wide
    - POC: Chris Wright (CBP)
- Locally Designated Impaired Waters App
    - Watershed-wide
    - 2014 Integrated Water Quality Impairments by type of impairment
- Toxic Contaminant Relative Risk mapping model
    - Endocrine Disrupting Program
    - POC: Chris Wright (CBP)
- Green vs. Grey Infrastructure research
- Floodplain Ecosystem services model
    - POC: Chris Wright (CBP) and Diana Hogan
- FEMA Flood Insurance Data models
    - Eastern geographic science – USGS center
    - POC: Chris Wright (CBP) and Diana Hogan

- Dam Watch (NRCS)
- Smithsonian Environmental Research Center (SERC)
    - 3-year study funded by NOAA on natural shoreline vs. riprap shoreline, and the impacts on erosion and habitat
    - Lead PI: Tomjordan@serc
- FEMA – USGS HAZUS Mapping project

Public Access and Educational Stewardship

- Chesapeake Bay Program Management Strategies (chesapeakebay.net): http://www.chesapeakebay.net/managementstrategies
    - POC: Renee Thompson (Coordinator, Maintain Healthy Watersheds GIT)
- USACE Lake recreation websites (nab.usace.army.mil)
- Volunteer and church organizations

Chesapeake Bay Comprehensive Water Resources and Restoration Plan
Attachment 6: Mapping Activity

The stakeholder workshop included three breakout sessions through which participants could share information and ideas, which were mostly captured on maps of the watershed. This attachment captures the existing or planned actions in the watershed as noted by workshop participants, including geospatial analysis and information related to restoration actions. These actions are organized by the six topics of the workshop. They are further categorized by actions occurring in the upper watershed, lower watershed, and general actions that are not location specific. For the purpose of this exercise, the boundary between the upper and lower watershed is defined as the southern border of Pennsylvania.

Climate Change

Upper Watershed

Existing Actions

- Chesapeake Bay Program (CBP)'s Habitat Goals Team identified high priority catchments for Brook Trout that should be restored to increase resiliency to stream temperature increases
- Mitigation work funded by the Upper Susquehanna Coalition

Planned Actions

- Pennsylvania and The Nature Conservancy (TNC) will conduct mapping of roadside ditches and wetland conditions

Lower Watershed

Existing Actions

- Since 2010, all Maryland Department of Natural Resources (MDNR) restoration projects are required to incorporate climate resiliency into all aspects of the project
- Maryland's Climate Change Commission and associated plans
- Innovative beneficial re-use strategy, including pilot projects, established by the Maryland Port Administration
- Maryland Coastal Resiliency Assessment, developed by MDNR and TNC: identifies priority properties for restoration and conservation, based on where natural features will best buffer coastal communities
- Maryland's Dredged Material Management Plan
- Sandy-funded climate change study conducted by the North Atlantic Landscape Conservation Cooperative
- National Park Service (NPS) conducted a climate adaptation plan for Assateague Island
- Land acquisition and conservation efforts by the Virginia Coastal Zone Management Program
- Multiple adaptation projects at Blackwater National Wildlife Refuge

- Living shoreline projects in Maryland that have incorporated local sea-level rise estimates into project designs: Gunston School, Ferry Point Park, Conquest Preserve, Shingle Beach
- Climate vulnerability assessment for the National Oceanic and Atmospheric Administration (NOAA) Choptank Habitat Focus Area
- NOAA buoy systems can provide in-situ observations
- Climate Action Plan and Resiliency Plan for the District of Columbia (DC)
- Marsh restoration at the George Washington Memorial Parkway dyke, conducted by the National Park Service
- Wetland vulnerability assessment and planning for tidal and non-tidal areas conducted by the Chesapeake Bay Program, NOAA, and the U.S. Environmental Protection Agency (EPA)
- City of Baltimore Sustainability Plan
- Assessment of opportunities for green infrastructure to provide climate resilience in Baltimore, conducted by The Conservation Fund
- 100 Sustainable Cities Project for DC and Norfolk, Virginia
- Chesapeake Bay Foundation strategic plan on island habitat, which is disappearing due to sea-level rise and subsidence
- Chesapeake Marshlands National Wildlife Refuge complex and greater effort to understand marsh migration on the lower shore of Maryland and its impact on habitat
- Hampton Roads intergovernmental planning pilot

Planned Actions

- Climate adaptation incorporated in the DC Ready Plan, prepared by the District Department of the Environment (DDOE) Office of Planning
- Sea-level rise plan for the City of Baltimore
- Maryland Department of the Environment (MDE) developing guidance for re-use of dredged material
- Harford County green infrastructure plan to address sea-level rise and riverine flooding due to climate change
- Hydrologic modifications to Farm Creek Marsh (Dorchester County) as a strategy for adapting to sea-level rise
- Delmarva restoration and conservation strategy
- Adaptive management and climate trend assessment for blue crab, oysters, and submerged aquatic vegetation
- Fringe wetland creation, seawall removal, and wetland restoration on the Anacostia River, conducted by DC and the National Park Service
- Investigation of policy and permitting implications of thin layer application on wetlands vulnerable to sea-level rise and subsidence (2017 NOAA Coastal Management Fellow Proposal)
- Marsh restoration in Ridgleys Cove, Baltimore
- Landscape Conservation Design for Patuxent National Wildlife Refuge, led by the USFWS
- Proposed climate change and sea-level rise study for Tangier Island
- NOAA federal funding opportunity in 2017 for climate, fisheries, and habitat interactions
- Virginia Adaptation Portal, in development and expected late 2016

General

Existing Actions

- State Wildlife Action plans have a climate change component
- Best management practices for meeting the Total Maximum Daily Load (TMDL) in the Chesapeake bay watershed incorporate climate change as part of the water quality criteria goal attainment
- Studies of the effect of sea-level rise on American Black Ducks in National Wildlife Refuges, conducted by the U.S. Geological Survey (USGS) for the U.S. Fish and Wildlife Service (USFWS)
- USGS study on the impacts of climate change on phosphorus in the Chesapeake Bay
- Watershed Resources Registry

Planned Actions

- NOAA-funded Mid-Atlantic Regional Integrated Sciences and Assessments (RISA), with a focus on tidal flooding in the Chesapeake Bay watershed

Ecosystem Restoration

Upper Watershed

Existing Actions

- Natural Resource Conservation Service (NRCS) agricultural best management practices (BMPs) for pasture rotation and fencing, and stream fencing
- USFWS and Pennsylvania - Partners for Fish and Wildlife Program, focused on stream and wetland restoration, and native plant restoration for Golden-winged Warbler and American Woodcock
- USFWS and U.S. Department of Agriculture (USDA) restoration and streambank fencing (HABITS?)
- Mill Creek watershed restoration in Lancaster County
- York County landfill conversion to native habitat
- Streambank fencing, buffers, and associated stream bank restoration
- Some stormwater-specific pilots
- AMD/AML restoration, conducted by PADEP/BAMR
- Grant dollars for targeting sites linked to impaired waters

Planned Actions

- Brook Trout and effects of UDG
- Conservation and mitigation banking system
- USGS study on contaminants affecting fish health
- Improved fish passage facilities through the Federal Energy Regulatory Commission (FERC) resilience program on the Lower Susquehanna River
- Forest preservation, conducted by the USFWS

Lower Watershed

Existing Actions

- All MDNR restoration projects since 2010 are required to incorporate climate resiliency components into all aspects of the project
- MDNR's Chesapeake and Atlantic Coast Trust Fund grant program
- MDNR's Shoreline Conservation Service has a zero-interest loan program for living shoreline projects
- NOAA has oyster reef ecosystem services studies in Maryland and Virginia tributaries, which focus on water quality and fish habitat
- Virginia Department of Environmental Quality (VDEQ) State Revolving Fund and Stormwater Loan Fund
- Submerged aquatic vegetation (SAV) restoration in the Chesapeake Bay and coastal lagoons, conducted by the Virginia Institute of Marine Science (VIMS) in partnership with others
- Middle Branch Restoration Strategy, a partnership including Greater Baltimore Wilderness
- $8 million NPS water quality BMPs via the Maryland Trust Fund
- Restoration projects that incorporate beneficial re-use at Poplar Island and James Island, conducted by USFWS in partnership with Maryland
- DC urban stream restoration
- Principio Creek public/private partnership in Cecil County
- Pocomoke River restoration project, conducted by Maryland and The Nature Conservancy
- $50 million in NPS projects for 2017-18 in the Maryland Trust Fund
- Conowingo Dam sediment and phosphate issue – U.S. Army Corps of Engineers (USACE), Maryland, Pennsylvania, EPA, and others
- NOAA fish passage prioritization
- NOAA Choptank Habitat Focus Area, which accounts for climate vulnerability, oyster restoration, and community engagement
- Ducks Unlimited and MDNR Choptank watershed restoration program, focused on agricultural landscapes
- Wetland migration corridors on marginally productive agricultural land on the lower Eastern Shore/DelMarVa Peninsula for American Black Ducks
- Ducks Unlimited partnership with USFWS and local land trusts, Chesapeake Rivers North Atlantic Wetlands Conservation Act (NAWCA) Program – easements and fee title acquisitions in the lower Eastern Shore and Lower Delaware
- Ducks Unlimited partnership with the USFWS, Atlantic Coast Joint Venture (ACJV), and National Fish and Wildlife Foundation (NFWF) – easements and fee title acquisitions within the Black Duck Joint Venture, and Black Duck priority areas on the Maryland and Virginia eastern shores
- Assateague Island beach renourishment conducted by USACE
- USACE Cedar Island beneficial use of dredged material, for oyster beds, wetlands, and mudflats
- Chesapeake Bay native oyster restoration master plan, for all tributaries
    - Restorations in place for Harris Creek, Avon, and Little Choptank

    - Great Wicomico Chesapeake Bay native oyster restoration and potentially next tributary for restoration
    - York River – next Virginia tributary for native oyster restoration
- Preserving wildlife and waterfowl habitat around Rappahannock National Wildlife Refuge (NWR) in the face of development pressure
- Oyster restoration in Piankatank, Lynnhaven, and Lafayette, conducted by NOAA in partnership with USACE and Virginia
- Lynn River basin ecosystem restoration for SAV, oysters, and wetlands
- Elizabeth River watershed restoration plan
- Chesapeake Bay Foundation living shoreline at St. Johns College in Annapolis and other areas
- Eastern Brook Trout "stronghold" at Upper Gunpowder River in Maryland
- DC seawall removal and fringe wetland restoration
- Polychlorinated biphenyl (PCB) and TMDL clean-up in DC, Maryland, Virginia, and TCW
- DC government stream restoration at Pope Branch and Springhouse Run
- Department of Energy and Environment (DOEE) and DC government Anacostia toxics study
- NPS deer and goose management
- DOEE and NPS cooperative weed management
- DC government wildlife restoration plan for pollinators
- USACE Dyke Marsh wetlands re-establishment on the Potomac River
- Several HUC-10 watershed-based plans have identified contaminants of concern and strategies
- Recently upgraded wastewater treatment plants with highest nutrient reduction technology and capacity in the Potomac Basin of West Virginia
- West Virginia Department of Natural Resource (WVDNR) impoundment removal projects for trout
- Brook Trout habitat restoration work at West Virginia headwaters and streams through fencing and stream restoration

Planned Actions

- DelMarVa Peninsula conservation and habitat plan, conducted by USFWS Chesapeake Bay Field Office
- Upper Potomac in West Virginia and Virginia – Potomac Highlands cooperative weed and pest management areas
- Shoreline restoration at Cambridge Beach, Howbrooks Beach, Hurst Creek, Franklin Point Park, and St. Catherine's Island
- DOEE/NPS outfall restoration plan and implementation
- DC government stream restoration at Fort Dupont, Spring Valley, and Pinehurst Branch
- DC government Oxon Run Stream restoration
- DOEE/DC government Anacostia toxics mitigation plan
- DOEE/NPS Anacostia wetland restoration
- Charles Town West Virginia, Emmits Run Green Corridor
- MS4s have strategies to restore and address contaminants or concerns

<u>General</u>

Existing Actions

- USACE mitigation areas and banks
- USFWS – Partners for Fish and Wildlife basin-wide riparian and wetland restoration
- Watershed Resources Registry (WRR) completed for Maryland, which contains maps and scored areas for conservation and restoration, conducted by EPA Region 3 in partnership with the state and USACE
- Chesapeake Bay Foundation's restoration staff focus on forested buffers and stream fencing in Pennsylvania, Maryland, and Virginia
- Monarch Initiative through USFWS, which can be used for federal, state, and private land
- USFWS North Atlantic Landscape Conservation Cooperative looking at aquatic connectivity and stream blockages through the entire watershed
- ARP – PG and monitoring of stream restoration
- Karst hydrogeology impacting groundwater and seeps/springs
- American Rivers dam removal and landowner engagement

Planned Actions

- WRR underway for Virginia, West Virginia, Pennsylvania, and Delaware, conducted by EPA Region 3 in partnership with states and USACE
- NFWF Central Appalachians Restoration Program
- NRCS Conservation and Easement Programs

Riverine and Coastal Flood Risk Management

Upper Watershed

Existing Actions

- Post-flood intervention conducted by the Upper Susquehanna Coalition
- Prioritization tool for fish passage dam removal
- Inland assessment of fish habitat vulnerability conducted by the National Fish Habitat Partnership

Planned Actions

- Middle Susquehanna flood risk management comprehensive study, conducted by USACE
- Chesapeake Bay Goal Team funding in 2016 for high resolution Lidar stream mapping

Lower Watershed

Existing Actions

- Ellicott City Study
- U.S. Forest Service "Forests to Faucets" initiative

- MDNR Working Waterfronts Program, evaluating coastal flood risk when planning to preserve or enhance rural waterfront communities – St. Michaels, Tilghman, Bellevue, Rock Hall, Oxford, Cambridge
- MDNR Living Shorelines Program
- Silver Jackets multi-hazard tournament for the Virginia peninsula
- Norfolk City Focus Area Study, conducted by USACE
- Norfolk has $100 million U.S. Department of Housing and Urban Development (HUD) grant for a small neighborhood to integrate green and gray infrastructure for reducing flood risk
- USACE Continuing Authorities Program studies for Norfolk, Newmarket Creek, and James River Shoreline
- Eastern Panhandle of West Virginia has stormwater and floodplain management requirements (H and H study required for developments occurring in Zone A areas)
- Community Rating System participation in Jefferson, Berkeley, and Morgan Counties, and the City of Martinsburg
- Berkeley County, West Virginia participated in the Federal Emergency Management Agency (FEMA) buyout program along areas of repetitive loss
- Healthy Watersheds mapping in West Virginia, conducted by The Nature Conservancy
- Maintain healthy watersheds GIT for the Chesapeake Bay Program
- USACE levee and dam safety programs
- Maryland Coastal Resiliency Assessment, which identifies coastal flood risk areas in socially vulnerable communities
- Pocomoke River floodplain restoration, conducted by MDNR, NRCS, The Nature Conservancy, and the USFWS
- Maryland's state highway sea-level rise and coastal flood study
- Beneficial re-use for marsh restoration in Blackwater Marsh National Wildlife Refuge
- Climate vulnerability assessment for NOAA's Choptank Habitat Focus Area
- City of Annapolis flood study
- Poeloede Dam removal
- Oxen Run flood analysis, conducted by DC and USACE
- DC Silver Jackets are updating DC's flood emergency manual
- Online flood inundation mapping tool for the Potomac and Anacostia Rivers, created by DC Silver Jackets, which is tied to USGS gauges, and shows real-time depth and extent of flooding
- National Park Service flood management plan at Assateague
- NOAA sea-level rise viewer
- EPA-funded Virginia Eastern Shore sea-level rise and tidal flood reduction financing strategies
- High Water Mark campaigns
- Norfolk participation in 100 Resilient Cities
- Hampton Roads interagency pilot study
- USACE constructing flood walls for Richmond and Norfolk, and doing beach nourishment at Willoughby

Planned Actions

- Coastal Focus Area Report, conducted by USACE

- USDA Natural Resource Conservation Service projects for Conowingo Dam
- DC metro area coastal focus study, conducted by USACE
- DC levee
- NOAA-funded Mid-Atlantic Regional Integrated Sciences and Assessments (RISA), with a focus on tidal flooding in the Chesapeake Bay watershed
- Coastal Storm Risk Management for Virginia Peninsula
- DC Silver Jackets Flood Risk Management Study for Watts Branch
- Currently working on hazard mitigation planning for the Eastern Panhandle of West Virginia, with an emphasis on restoring floodplains and using green infrastructure to reduce risk
- MDNR's Adaptation and Response Working Group evaluation of coastal exposure in riverine areas
- FEMA and Maryland Emergency Management Agency planned tidal flood gauges in Maryland
- Anacostia seawall removal and wetland restoration project, conducted by NFWF, DC, and the National Park Service
- Potomac seawall removal and wetland restoration project, conducted by DC and the National Park Service
- Development pressure project, phase 6 for land use, conducted by USGS
- Optimization for the Chesapeake Assessment Scenario Tool (CAST) is underway at the Chesapeake Bay Program, which will try to include co-benefits like flood reduction

General

Existing Actions

- Watershed Resources Registry
- Riparian and stream channel restoration study conducted by the USFWS
- North Atlantic Aquatic Connectivity Collaborative culvert assessment across the Northeast, including the Chesapeake Bay, for fish passage
- FEMA mapping of riverine flooding areas
- Technical assistance provided by the Wetlands Watch Community, including a sea-level rise app and crowd-sourced flood event application to validate models
- USGS Sediment Board Contaminant Resiliency and Response Program
- USGS Floodplain Ecosystem Services Model
- Locally designated impaired waters app, created by the Chesapeake Bay Program
- USGS study on green and gray infrastructure
- Toxics Relative Risk Map, part of the USGS Endocrine Disruptors Compound Project

Regional Sediment Management

Upper Watershed

Existing Actions

- NRCS project related to sediment at Conowingo Dam

- RFI for sediment removal at Conowingo Dam
- USGS study of sediment flow in and out of Conowingo Dam
- Landfill reversion to native meadow in York County, Pennsylvania because of erosion due to woodchucks
- Snitz Creek stream and wetland restoration project, conducted by Pennsylvania Department of Transportation (PADOT) and partners
- Spring Creek stream and riparian restoration
- Cabin Creek riparian restoration
- Nicodemus Stream and wetland restoration project, conducted by PADOT and partners
- State designated local impairment maps, from the Chesapeake Bay Program
- USFWS – Partners for Fish and Wildlife riparian restoration in West Virginia
- Existing sediment control program (Clean Streams Law) in Pennsylvania
- Dollars to CCD for onsite restoration (streamside projects) in Pennsylvania
- Implementing Hydrologic Unit Code 12 watershed-based plans for streams impaired by sediment
- USGS study of sediment sources in agricultural and urban watersheds
- USGS monitoring of sediment in non-tidal streams

Planned Actions

- USGS study on the effect of unconventional oil and gas (UOG) on sediment to streams, mostly in Pennsylvania
- Conewango Creek streambank stabilization project, conducted by USFWS and partners
- Deep Creek stream restoration project, conducted by USFWS and partners
- USFWS – Pennsylvania Field Office, partners for fish and wildlife restoration projects related to streams, riparian areas, and wetlands
- Expanded Potomac Highland Cooperative Weed and Pest Management Area for Virginia and West Virginia
- Phase III Watershed Implementation Plan
- Department of Agriculture assistance for streambank fencing in Pennsylvania

Lower Watershed

Existing Actions

- Stormwater management pond and dredging projects at Columbia Lakes and Lake Whetstone in Maryland
- Cover crops in Maryland, funded by MACC
- Dam removal and passive sediment release at Poloede and Simpkins Dams in Maryland
- Stream restoration and floodplain reconnection projects in local Watershed Implementation Plans in Maryland
- Maryland Port Administration dredged material management plan
- Chesapeake Bay TMDL sediment loads
- Beneficial use at Poplar Island
- Wicomico River dredging and Ellis Bay Wildlife Management Area (WMA) restoration

- Smith Island and Martin Wildlife Refuge protection, conducted by the USFWS
- VIMS Shoreline Management Model for Virginia, which has best management practices that emphasize natural and nature-based features based on ecosystem conditions
- VIMS Shoreline Evolution Studies, which contain a GIS analysis of shoreline change rates in Virginia
- VIMS Shoreline Inventories for Virginia and Maryland, including shore hardening, living shoreline projects, unstabilized shores, tidal marshes, and beaches
- USGS study on the effect of sea-level rise on sediment near USFWS refuges

Planned Actions

- 50-foot channel widening in Baltimore
- USACE restoration project at James Island (currently not active)
- Barren Island protection
- Anacostia River sediment TMDL
- USACE Assateague Island dredged material placement
- USACE requested funding for Eastern Shore regional sediment management study
- Potential USACE project for dredged material placement and shoreline erosion control on Tangier Island
- Potential USACE study for beneficial use of dredged material on Cedar Island

General

Existing Actions

- Local sediment TMDLs
- Sediment-bound contaminant resiliency and response strategy (SCoRR)
- USDA NRCS on farm erosion control practices across the watershed

Public Access and Educational/Stewardship Opportunities

Upper Watershed

Existing Actions

- Public access data from the Chesapeake Bay Program (POC: Andy Fitch)
- Chesapeake Bay Stewardship Goal Implementation Team coordination (POC: Amy Handen)
- USACE recreation areas have their own outreach programs

Planned Actions

- WVDNR considers increasing river and creek access in locations as an ongoing process, dependent on land process and other factors
- USFWS Offshore Pest Information System (OPIS) urban outreach
- Work with PADOT to include public access in planned road projects – in the Chesapeake Bay Program public access work plan

- Improve and upgrade public access on Department of Defense (DOD) sites
- Land acquisition, including private stream access to wild trout areas

Lower Watershed

Existing Actions

- Chesapeake Bay Foundation oyster gardening program
- Most of MDNR's restoration projects have a public access component, which can be found on their website
- NOAA's Choptank Habitat Focus Area
- Chesapeake Bay John Smith Trail has multiple waypoints throughout watershed for environmental and historic outreach and access
- Chesapeake Bay observation buoy system ("smart buoys") throughout the Bay with real time data and education
- Blackwater NWR easement and fee title acquisition within their expansion boundary. Partnership includes USFWS, Duck Unlimited, Chesapeake Conservancy, Patuxent Naval Air Station, and others
- Solar-powered Baltimore Harbor trash wheel for the Inner Harbor and Canton
- DC 17th Street levee flood tour task force
- Masonville Cove Urban Refuge Partnership through USFWS
- NOAA National Estuarine Research Reserves
- Partnership between NOAA, Maryland, and Virginia Sea Grant (POC: Troy Hartley and Fredericka Moser)
- Schoolyard habitats in Maryland through USFWS
- Audubon Bird Sanctuaries and marsh restoration projects on the Eastern Shore of Maryland, Delaware, and Virginia
- NOAA Environmental Science Training Center in Oxford, Maryland (POC: Bart Merrick)
- Poplar Island Terrapin Program: elementary schools raise juvenile terrapins and take a field trip to Poplar Island for release
- SAV restoration on the Eastern Shore, conducted by the Chesapeake Bay Program
- Public Access Authority in Northern Neck, Virginia - land donations, acquisitions, and infrastructure development
- Public Access Authority in Middle Peninsula, Virginia - land donations, acquisitions, and infrastructure development
- Virginia non-government organizations (NGOs) with outreach programs – Lynnhaven River Now, James River Association, Friends of Rappahannock
- Chesapeake Bay Program and Lynnhaven River Now oyster spat growing and placement reefs on the Lynn River
- USACE project for outreach on Chesapeake Bay native oyster recovery with Norfolk Christian Academy: the students grow, measure, ID organisms, and place spat on existing reefs
- Lynnhaven River Now planting and restoration with local schools

Planned Actions

- Ridgely Cove
- Increased access at the Chesapeake Bay John Smith Trail, managed by the National Park Service
- Port Covington ecological pier redevelopment at Baltimore Middle Branch
- Baltimore Rivers to Harbors Urban Refuge Partnership, through USFWS
- City of Baltimore Open Space Plan
- Public access sites for subsistence fishing and opportunities for outreach on toxics

General

Existing Actions

- Chesapeake Bay Foundation education programs in Pennsylvania, DC, Maryland and Virginia. Centers located at Smith Island, Karen Norman Center, Bact Harbor, DC, Susquehanna, Hampton Roads
- STEM outreach
- Mapping schools and outdoor education experiences
- Chesapeake Bay Program management strategies include diversity; an existing appendix shows current outreach strategies and gaps, connected with the Chesapeake Research Consortium
- Chesapeake Bay Program's land conservation priorities for farms, forests, culture, habitat, and human health all present interpretive and stewardship opportunities
- Talk with NPS (POC: Jonathan Doherty)
- Free daily tours on Poplar Island
- Hispanic access, working with communities
- Chesapeake Bay Program diversity metrics for low-income and minority population areas
- America's Natural to Cultural Resources Volunteer Portal – volunteer.gov
- NOAA Bay Watershed Education and Training Program Grants (POC: Shannon Sprague)
- Oyster shell recycling by multiple NGOs
- Chesapeake Bay Program has "engaged communities" strategies and management plans related to citizen stewardship, diversity, environmental literacy, public access, sustainable schools, and local leadership

Planned Actions

- Public access creation at state highway water crossings in Maryland and West Virginia
- Citizen monitoring through non-profit network presents stewardship opportunities
- Publication of a manual that identifies school grounds for learning

Policy Needs and Implementation Barriers

Upper Watershed

Existing Actions

- West Virginia and Pennsylvania transportation policy that new projects allow or consider public access

- Pennsylvania Agricultural BMP targeting of funding and resources

Lower Watershed

Existing Actions

- Maryland nutrient trading - combined sewer overflow (CSO) coordinates with states through the Coastal Zone Management act (CZMA)
- Virginia management of state/local partnerships; decision made by local boards without training – Dillon Rule, for example

General

Existing Actions

- Barriers with current USACE policy to create more natural flood risk management approaches and modifications
- Federal agencies are not following EISA – it is underutilized
- Land conservation plans through CREP, WRP, agricultural preservation
- NGO, DOD, and other grant programs do not allow federal agencies to apply and receive funding
- Point and nonpoint source programs and criteria by Public Service Commissions and EPA 319 Program – there are conflicts with each other and overall Bay restoration
- All living shoreline policies – states, Nationwide Permits, regional permits
- NED and NER justifications are complicated, and studies avoid and approach singular-perspective projects
- Best Management Practices for policies on riparian, streams, wetlands, and financing (reference Chesapeake Bay Program documents)
- USFWS Endangered Species Act mitigation policy, related to the USFWS and Federal Highway Administration (FHWA) policy for birds
- Host of strategic plans for Landscape Conservation Cooperative, Ducks Unlimited, NFWF
- Need to eliminate regional conditions for planning restoration projects
- Barrier with the 319 program – does not allow point sources to be funded (and "may" not be able to be used in MS4 areas)
- Source Water Protection Plans, Groundwater Management Areas/Plans, Local Stormwater (MS4) and Comprehensive and Economic Development Plans
- State Wildlife Action Plans
- State Water Plans
- Virginia Climate Commission, Joint Subcommittee on Flooding
- State Climate Adaptation Plans
- State and local hazard mitigation plans
- State outdoor and recreation plans
- Healthy Waters Initiative, through EPA
- Section 319 Watershed Plans – scenic river designations. Also, 305(b)? highest use and 303(d) listing/designated uses
- State Air Reposition Mitigation Plans

- Regional Greenhouse Gas Initiative
- Local Solid Waste Authority Plans
- USACE business line budgeting constrains Integrated Water Resources Management projects and watershed-wide implementation
- Phase III Watershed Implementation Plan
- National Environmental Protection Act (NEPA) barrier – costs more and takes time
- Chesapeake Bay Agreement – USACE small channel dredging, no $ decision
- DOD Readiness Environmental Protection Initiative (REPI) Program
- Greater Atlantic Regional Fisheries Office (GARFO) Habitat Restoration Strategic Plan, through NOAA (POC: Kristy Beard)
- MS4 and stormwater enhancements – support recharge

Planned Actions

- Federal Flood Risk Management Standard, which will reconnect floodplains and provide consistent standards
- Chesapeake Bay Agreement – midpoint assessment, Watershed Implementation Plans, impacts of climate change
- Public-private partnerships
- Ecosystem goods and services – USACE, EPA, MDNR, and others
- Reauthorization of the CZMA
- Principles and Guidelines
- Use the CBCP as a pilot of "running" watershed informed budget process
- Water Resources Registry through EPA
- Water Resources Development Act from Regional Sediment Management table discussion
- EPA is working on an offset mitigation policy (states will develop specific implementation plans)

Chesapeake Bay Comprehensive Study Stakeholder Workshop

Attachment 7: Stakeholder Priorities

The Stakeholder Workshop included three breakout sessions through which participants could share information and ideas, which were mostly captured on maps of the watershed. This attachment captures the work of breakout sessions 2 and 3, where participants identified and then prioritized data gaps and needed actions for the U.S. Army Corps of Engineers (USACE) and other agencies. USACE stakeholders participated in an informal prioritization exercise to highlight which needed actions are the most urgent/important, as defined by what each represented entity would ideally want to see as part of the path forward with the comprehensive study. The actions are listed below in order of priority and are organized by the six topics of the workshop. The top 5 priorities identified overall are:

1. Ecosystem Restoration: Large, multi-benefit restoration projects for future implementation (with a focus on funding and policy issues);
2. Climate Change: Integrate green infrastructure strategies to generate multi-benefit projects;
3. Regional Sediment Management: Uniform geospatial analysis (across Bay region) of: sediment-strained habitats, shoreline erosion, coastal risk, stream stability, littoral drift, coastal wetlands;
4. Policy Needs and Implementation Barriers: Streamline regulatory permitting process for restoration projects; and
5. Riverine and Coastal Flood Risk Management: Prioritize floodplain restoration and conservation based on ecosystem services, as defined by existing studies, and provide technical assistance to communities for the identification of co-benefits of flood risk management and MS-4 storm water regulations.

Climate Change

1. Integrate green infrastructure strategies to generate multi-benefit projects (*15 votes*):
   a. Water quality
   b. Ecosystem resiliency
   c. Community erosion buffering
   d. Flood mitigation (i.e., Elliot City)
   e. Wetland areas
2. Need for wetland migration mapping 2025, 2050, 2100 (*8 votes*)
3. Develop a strategy to prioritize protection and enhancement of Tangier Sound ("Heart of the Bay") (*4 votes*)
   a. Within next 50 years
   b. Displace Smith Island residents
   c. Cultural losses
   d. Economic impact(s)
   e. Native species habitat loss
4. Need to identify large-scale restoration projects: 2025, 2050, 2100 (*2 votes*)
5. Increase awareness of availability of the North Atlantic Coast Comprehensive Study (NACCS) report (*2 votes*)

    a. Means to scale results to state and local levels (technical assistance)
    b. Coordinate financial capabilities and authorities to assist local entities
6. Need a process to make climate smart restoration (*1 vote*)
7. Need better modeling of extreme precipitation events and impacts on the watershed (*1 vote*)
8. Apply NACCS results to other relevant GIS layers
9. Need a drought vulnerability and impact study
10. Need to focus on human health implications
11. Change USACE authorization to require projects to protect beyond the 100-year event OR evaluate what is a valid storm event to protect communities

Riverine and Coastal Flood Risk Management

1. Prioritize floodplain restoration and conservation based on ecosystem services, as defined by existing studies (*9 votes*)
2. Provide technical assistance to communities for the identification of co-benefits of flood risk management and MS-4 (storm water regulations) (*9 votes*)
3. Target nature-based restoration around flood vulnerable communities (*8 votes*)
4. Quantify flood risk benefits and ecosystem services for wetland restoration (*7 votes*)
5. Use the National Oceanic and Atmospheric Administration's (NOAA) Sea-Level Rise viewer to conduct a vulnerability assessment of 3-foot scenarios (especially hazardous and toxic facilities) (*3 votes*)
6. Identify urban areas at risk from precipitation caused be flooding (*2 votes*)
7. Obtain data about co-benefits of Best Management Practices (BMP's) for flood risk reduction to inform Bay Program Optimization Tool (*2 votes*)
8. Apply Smithsonian Environmental Research Center (SERC) study data to local decision-making (*1 vote*)
9. Assess existing flood risk management projects (if it is still feasible); are modifications required to address current/future conditions? (*1 vote*)
10. Integrated riverine floodplain mapping for entire watershed at fine resolution (*1 vote*)
11. Light Detection and Ranging (LIDAR) data for watershed (*1 vote*)
12. Map risks related to drought (i.e., wildfire and subsequent flooding) (*1 vote*)
13. Change in floodplain vulnerability based on increased development pressure
14. Basin-wide headwater restoration
15. Fund Submerged Aquatic Vegetation (SAV) aerial studies
16. Make the NE culvert assessment useful for local decision makers
17. Identify/study flood vulnerable pipelines
18. Conduct a Shenandoah flood risk management study
19. Study increase of nuisance flooding for 2025, 2050, 2100
20. Look at upland flooding caused by outfalls inundated during floods (for the District of Columbia and others)
21. Identify individual area of impact for each activity

22. Conduct flood risk management outreach (i.e., high water mark campaign)
23. GIS mapping of streams needing daylighting
24. Stream order maps at 24,000 resolution
25. Characterize uncertainty associated with data
26. Understand economic losses related to different flood risk scenarios
27. Integrate flood, sediment management, ecosystem, etc. strategies
28. Reassess flood control rule curves at USACE dams

Regional Sediment Management

1. Uniform geospatial analysis (across Bay region) of: sediment-strained habitats, shoreline erosion, coastal risk, stream stability, littoral drift, coastal wetlands (*15 votes*)
2. (a) Activate sediment coordination workgroup to address comprehensive analysis of sediment locations, use transport and budgets across watershed and sub-basin scales (USACE and the Natural Resources Conservation Service are critical to these efforts) *(4 votes)*
   (b) Regional integration of dredging and beneficial reuse *(4 votes)*
3. Conduct hotspot analysis of legacy sediment across the watershed, for locations such as Conowingo Dam (*7 votes*)
4. Develop better information, control, and technical assistance related to agricultural pollutants and toxins (*4 votes*)
5. Coordination to address regulatory agricultural hurdles and agricultural Best Management Practices (i.e. cover crops) (*3 votes*)
6. Stabilize sediment and document impacts of thin layer placement in coastal wetlands (for locations such as the Blackwater Wildlife Refuge) (*3 votes*)
7. Share costs between states for moving sediment (*2 votes*)
8. Best Management Practices for roadside ditches and streams (*2 votes*)
9. Articulate co-benefits of habitats (e.g. restoration and beneficial use) (*1 vote*)
10. Restore steep gravel roads
11. Improve stream restoration assistance and improve assessment methods for stream stability and floodplain connectivity
12. Improve local agricultural partnerships
13. Improve Bay Model to address disconnect between bank erosion and upland storm water Best Management Practices, and to capture the Blue Carbon implications of tidal wetlands resilience and sediment movement
14. Carry out flow monitoring during design storms
15. Dredge small channels for boating public
16. Improve communication about the erosion/sediment impacts of hardened shorelines
17. Improve inlet management
18. Create uniform regulations for storm water management and water quality for the Bay
19. Consider flood risk in the context of older reservoirs authorized under other purposes
20. Address regional sediment management for hydropower dams on Susquehanna River

21. Leverage and coordinate with DoD Installations and other federal agencies through groups such as the Chesapeake Bay Comprehensive Plan Military Subteam

Public Access/Stewardship

1. Provide capacity to community colleges, trade schools (*3 votes*)
    a. Look to add a certification for restoration efforts
2. Local Champions for efforts (e.g. city council, church leaders) (*2 votes*)
3. Assessing Access Vulnerability under future conditions (*2 votes*)
4. External programs to promote issues – all partners work together (e.g. Monarch Initiative) (*2 votes*)
5. A stewardship registry of all non-governmental organizations (NGOs) involved in watershed (*1 vote*)
6. Schools/ "Youths" (*1 vote*)
    a. Create a curriculum (more than just Science, Technology, Engineering, and Mathematics (STEM)), ex. Forestry programs
    b. Plug into existing programs and county requirements (e.g. all VA 5th graders study the Chesapeake Bay)
    c. "Service" requirements in Junior High School
    d. Boy Scouts, Girl Scouts, 4-H
    e. Integrate school programs to tie USACE projects to communities
    f. Schools as "habitat experience"
    g. Plant growth and monitoring (art, math, science, etc.)
7. Communications – provide a "framework" for people to use (*1 vote*)
    a. Consistent messaging, branding, social marketing campaign with supporting graphics, and interpretive signage
8. Better analysis on decision-making to better inform our marketing (*1 vote*)
9. Community Service/Diversity (*1 vote)*
    a. Equity analysis to locate positive public projects in underserved areas;
    b. Language barriers;
    c. Diversity of income, population
10. Incorporate climate change considerations into design at access points (*1 vote*)
11. Establish a Chesapeake Bay "Report Card" (*1 vote*)
12. Establish local "friend groups" of the Bay (*1 vote)*
13. Partnering with DMV and Bay license plates (leverage opportunities)
14. Inventory of how citizens can assist and volunteer
15. Agricultural Education
    a. Coops and farmers markets – identify best management practices
16. Home Owners Associations (HOAs) – best practices, recommendations, and certifications (neighborhoods)
17. Expand Fresh Air Program to include recreational sites
18. Better coordination and reporting of activities at recreation sites for information sharing

19. Coordinate with ROTC programs to see if there are educational opportunities within the Bay watershed.

Ecosystem Restoration

1. Large, multi-benefit restoration projects for future implementation (with a focus on funding and policy issues) (*19 votes)*
2. Increase the flexibility for permits and regulations (*6 votes*)
3. Increase fish passage connectivity (*6 votes*)
4. The need to better quantify ecosystem services/develop further (*3 votes*)
5. Oysters as an adaptation/mitigation strategy (*3 votes*)
    a. Similar to Natural and Nature-Based Features (NNBF) and Engineering with Nature (EWN)
6. A robust, multi-agency team to take on a multi-year monitoring program (*2 votes*)
7. Extend public sewer extension projects in karst geological areas (*2 votes*)
8. Concurrent stream restoration focused on sediment control, toxic reductions, and fisheries (*2 votes*)
9. Push the envelope on restoration projects (*2 votes*)
10. Expand the assessment of marginally healthy systems (*2 votes*)
11. A Tidal Wetlands Interface with better data synthesis (*1 vote*)
12. One large, coordinated invasive species effort (*1 vote*)
13. Chesapeake Islands habitat restoration (*1 vote*)
14. Consider all critical, multi-ecosystem functions before selecting state plans (*1 vote*)
15. Incorporate ecosystem repairs *from* headwaters *to* coast (*1 vote*)
16. Innovate and monitor adaptive management (*1 vote*)
17. Funding for SAV aerial survey (*1 vote*)
18. Re-introduction of keystone predator species to help forest regeneration, reduce invasive species, etc. (*1 vote*)
19. Identify boundaries for existing and planned actions (geospatial analysis)
20. Conduct a watershed assessment in the Shenandoah Valley
21. More inclusive fisheries management plan
22. Urban trash management
23. Review the USGS Small Watershed study to determine how USACE can alleviate sources of pollution within those regions. West Virginia is consistent with the Smith Creek study and interested in the Corp extending sanitary sewer to areas with older and poorly sited septic systems.

Policy Needs and Implementation Barriers

1. Streamline regulatory permitting process for restoration projects (*14 votes*)

2. Analyze and review existing jurisdictions' tidal wetland policies – compare with science and with actual actions on the ground (why is there still hardening?) (*6 votes*)
3. Project selection criteria – allow for the prioritization of multi-beneficial uses, partner contributions, and long-term benefits (USACE) (*5 votes*)
4. Include BMPs and LIDs into other projects (USACE wetland and stream restoration projects) (*3 votes*)
5. Align federal highway roadside ditch practices with wetland creation corridors for habitat and flood risk management (*2 votes*)
6. Tools for quantifying costs and benefits, especially ecosystem restoration (*2 votes*)
7. Guidance to jurisdictions and other partners to help efficiently make progress on restoration (*2 votes*)
8. Eliminate hardened shoreline permits in potential wetland migration corridors (*1 vote*)
9. Identify clear drivers for private investment (*1 vote*)
10. Need policy/reduce barriers – USACE restoration cannot be used toward MS4 credits
11. Broader use of USACE technical assistance projects
12. Concentrate work in areas to serve vulnerable communities
13. USACE relax least cost alternative requirements for Dredged Material Management Plans (DMMPs) (limits project opportunities)
14. Coordination among local ordinances for consistency
    a. A catalogue of regulatory tools to bring awareness
15. Provide more opportunities for in-kind cost-share and have less paperwork requirements
16. National strategy for Integrated Water Resource Management (IWRM), Flood Risk Management, and Ecosystem restoration
17. Align agriculture and preservation programs with higher conservation requirements for habitat and water quality (NRCS)
18. Align resources and concentrate them at upstream sites for sediment loads above Conowingo Dam and offset release events.

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 8: Chesapeake Bay Comprehensive Plan (CBCP) Framework

(see following 3 pages)

Chesapeake Bay Comprehensive Water Resources and Restoration Plan Framework

Authority

The U.S. Corps of Engineers- Baltimore and Norfolk Districts has been authorized to develop a Chesapeake Bay Comprehensive Plan (CBCP) that will provide a single, comprehensive, and integrated restoration plan to guide the implementation of projects affecting the Chesapeake Bay estuary. The CBCP will be developed to avoid duplication of ongoing or planned actions by others and will focus on USACE core mission area (ecosystem restoration, navigation, and flood risk management). The study will be conducted under the authority provided by the United States Senate Committee on Environment and Public Works, Committee Resolution adopted September 26, 2002. The study resolution reads as follows:

"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."

The study is also being conducted under the authority provided by Section 4010(a) of the Water Resources Reform and Development Act of 2014 (WRRDA 2014). The study resolution reads as follows:

"Section 4010(a) of WRRDA 2014 further amends Section 510 of the Water Resources Development Act of 1996, which authorized the Chesapeake Bay Environmental Restoration and Protection Program (Section 510 Program). Section 4010(a) directs development of a comprehensive Chesapeake Bay restoration plan no later than 2 years after the enactment of WRRDA 2014 and provides for design and construction, cost shared 75 percent Federal and 25 percent non-Federal, of water-related resources protection and restoration projects affecting the Chesapeake Bay estuary, based on the comprehensive plan. It changes the types of projects eligible for assistance to sediment and erosion control; protection of eroding shorelines; ecosystem restoration, including restoration of submerged aquatic vegetation; protection of essential public works; beneficial uses of dredged material; and other related projects that may enhance the living resources of the estuary. It provides that Section 510 will be carried out in cooperation with appropriate federal, state and local government agencies."

Vision

On June 16, 2014, the Chesapeake Bay Watershed Agreement was signed. Signatories included representatives from the Chesapeake Bay Commission, State of Delaware, Maryland, New York, and West Virginia, the Commonwealths of Pennsylvania and Virginia, the District of Columbia, and the Federal Leadership Committee for the Chesapeake Bay including: U.S. Environmental Protection Agency, U.S. Department of Agriculture, U.S. Department of Commerce, U.S. Department of Defense, U.S. Department of Homeland Security, U.S. Department of the Interior, and the U.S. Department of Transportation.

The CBCP will incorporate the Chesapeake Bay Watershed Agreement vision for the Chesapeake Bay: "We envision an environmentally and economically sustainable 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."

Goal

The goal of the CBCP is to provide a single, comprehensive, and integrated restoration plan to guide the implementation of projects that would achieve the shared vision for a restored Chesapeake Bay by: (1) effectively and efficiently engaging Bay stakeholders to identify problems, needs and opportunities in the watershed and avoid duplication of ongoing or planned actions by others; (2) identifying actions by other local, state, and federal agencies and non-governmental-organizations (NGOs) in the watershed to address problems outside of USACE mission areas; and (3) determining where and how USACE mission areas could be utilized in the watershed to address problems, needs, and opportunities.

Problems

The problems plaguing the 64,000 square mile Chesapeake Bay watershed are broad and varied. Degradation of the watershed is a result of landscape alterations that were initiated by European colonization. Deforestation and other land use alterations have resulted in waterway impairment in the watershed.

Past human activities have resulted in adverse impacts like conversion of habitats to developed land, ecosystem degradation, loss of natural hydrology, increases in stormwater runoff and localized flooding, impaired water quality, introduction of an array of pollutants, and a loss of ecologically, culturally, historically, or recreationally significant landscapes. Ecosystem degradation includes impacts to numerous resources such as fisheries, submerged aquatic vegetation (SAV), wetlands and terrestrial habitat, riparian forest buffers, and coastal habitats.

Climate change and projected increased populations in the future are anticipated to magnify existing problems.

Other future problems may include water supply competition for ecological and biological processes versus consumptive use of an industrialized society. Furthermore, flood risk, both riverine and coastal within the Bay proper, may increase over time.

The CBCP will identify problems based on existing and future forecasted conditions. Once ongoing and planned actions are evaluated, opportunities could be established for additional actions by USACE and others.

Needs

While over thirty years of efforts to restore and maintain the Bay and its watershed have made great progress, ecological health remains impaired due to (1) the magnitude of the human population and land cover change and (2) the scale and diversity of problems. Due to the scale and diversity of problems, there is a need to coordinate USACE efforts with others and leverage funding and capabilities to protect, restore, and preserve the Chesapeake Bay.

Opportunities

USACE, in partnership with its non-federal sponsor the National Fish and Wildlife Foundation (NFWF), and in coordination with stakeholders will examine a variety of issues facing the Chesapeake Bay through several of its mission areas such as ecosystem restoration, flood risk management, navigation, coastal storm risk management, and water supply. Opportunities also exist outside of USACE mission areas for federal, state, and local agencies and NGOs to address water quality, reduce pollutant loads to the Bay through implementation of best management practices to manage stormwater, and promote land use decisions that sustainably manage population growth and development (i.e., land acquisition for conservation).

Objectives

The objectives of the study will be largely defined by the analyses of the problems, needs, and opportunities, and founded in the four Principles and Guidelines screening criteria for water resources projects: completeness, effectiveness, efficiency, and acceptability.

Stakeholder Involvement

Stakeholder involvement and collaboration on the CBCP is critical. Within the authority of the CBCP, stakeholders will be encouraged to provide periodic feedback into the development of the problems, needs, opportunities and objectives of the study, beginning with the stakeholder workshop meeting scheduled on November 7, 2016.

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 9: Stakeholder Workshop Evaluation Results

(see following 2 pages)

id num	1	2	3	4	5	6	7	8	9 - comments
eval 1	8	7	7	8	7	7	7	7	
eval 2	9	7	8	8	8	9	9	7	Table (small group) facilitators did a good job of guidance, discussion/keeping it on track.
eval 3	7.5	6.5	6.5	6.5	8	7.5	9	8.5	More pre-meeting guidance would have been helpful
eval 4	8	9	8	9	7	9	9	9	
eval 5	7	7	8	5	5	6	8	8	Moving forward, it would be useful to know if we are focusing on: USACE priorities; overarching Bay problems; individual jurisdiction priorities
eval 6	8	10	7	6	10	10	10	7	
eval 7	9	9	9	9	9	9	9	9	
eval 8	8	9	9	9	9	10	5	10	
eval 9	9	9	9	9	7	9	9	9	We did not get to the sequencing but the dialogue was informative. Good organizational structure of topics. Make sure to reach out to those voices not here today. Well done collaboration.
eval 10	10	9	8	8	8	8	10	9	
eval 11									Suggest that more narrow categories of topics (i.e. wetlands, FRM, SAV, stream restoration) and data be discussed/focused on during future meetings. Would have been helpful to have seen previous USACE restoration strategies (previous GIS data analyses, techniques) or strategies of partners.
eval 12	7 10	7 10	5 10	6 10	8 10	8 10	7 10	8 10	Great Job
eval 13	10	8	10	8	8	9	10	10	Part of the day seemed to drag/fell into low energy. The participatory format fostered good networking, discussion, and exchange of ideas.
eval 14	10	9	9	9	8	8	8	10	
eval 15	10	10	9	10	10	8	10	10	
eval 16	8	8	6	5	7	9	9	9	Please document all existing and planned actions and publish if possible.
eval 17	8	9	9	9	7	9	10	10	
eval 18	7	8	6	7	6	7	7	7	
eval 19	10	10	10	10	8	9	10	8	
eval 20	10	8	10	9	7	10	10	10	Similar facilitation process at each breakout group would be helpful. Breakouts were very valuable. Need to allow jurisdictions/agencies to review meeting summary and add ideas/concerns to the discussion. Not everyone was in the room.
eval 21	10	10	6	7	8	10	10	10	Re: Question 4: Bit hard to access process ahead of time, easier once discussion got underway.
eval 22	10	10	8	10	9	8	10	9	I'd like to understand the path forward more clearly. I'm still not sure how our ranking exercise is going to influence the overall study/project.
eval 23	7	5	6	5	7	7	8	6	I think better instructions prior to workshop would have been helpful e.g. I was not prepared to share specific project info for my organization. In addition, not sure if made sense to ID gaps that could/should be filled by others…low score on first questions reflect the confusion about expectations during first couple sessions. World café was effective. USACE presence at meeting seemed very heavy…stakeholder presence should have been greater? Good venue and organization Powerpoint could have been simplified (too text heavy to follow)
eval 24	8	7	6	6	7	7	9	8	watch for USACE acronyms/process because many don't understand it
eval 25	9	9	7	6	6	7	9	9	

									Thank you for the opportunity to provide input into this process. Yes there were many pink and orange sticky notes, but for each one there were probably 10 that were missed, can't include all though, understandable. Surprised to see the number of folks that chose similarly with respect to rankings. Would appreciate list of raw data assured by this collaborative meeting, not just discussions as it was difficult to capture everything...similar to what was developed (flowcharts) in tyhe Pittsburg Corps District on Allegheny watershed.
eval 26	8	9	9	9	9	9	8	9	Would be helpful to know how USACE ranked issues...just saying.
COUNT	**26**	**26**	**26**	**26**	**26**	**26**	**26**	**26**	
Ct Not at all	0	0	0	0	0	0	0	0	
Ct Weakly	0	0	0	0	0	0	0	0	
Ct Moderately to Mostly	4	7	10	10	11	6	4	5	
Ct Very much so	22	19	16	16	15	20	22	21	
Pct Not at all	0%	0%	0%	0%	0%	0%	0%	0%	
Pct Weakly	0%	0%	0%	0%	0%	0%	0%	0%	
Pct Moderately to Mostly	15%	27%	38%	38%	42%	23%	15%	19%	
Pct Very much so	85%	73%	62%	62%	58%	77%	85%	81%	
Pct 5+	100%	100%	100%	100%	100%	100%	100%	100%	
Median	**8.50**	**9.00**	**8.00**	**8.00**	**8.00**	**9.00**	**9.00**	**9.00**	
MEAN	**8.67**	**8.44**	**7.90**	**7.83**	**7.81**	**8.44**	**8.85**	**8.71**	
St. DEV	**1.14**	**1.33**	**1.51**	**1.68**	**1.27**	**1.15**	**1.29**	**1.18**	

Chesapeake Bay Comprehensive Water Resources and Restoration Plan

Attachment 10: Serving Local Communities in the Chesapeake Bay Region: The U.S. Army Corps of Engineers Technical Service Programs

(see following 7 pages)

Serving Local Communities

in the Chesapeake Bay Region

The U.S. Army Corps of Engineers

Technical Service Programs

From large-scale construction to small-scale analyses, the Corps is committed to Chesapeake Bay restoration initiatives at all levels across the region

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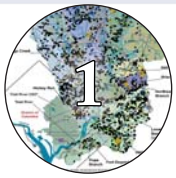
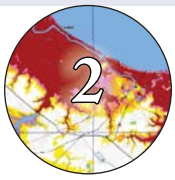


District of Columbia and Maryland



Delaware

Maryland

New York

Pennsylvania

Virginia

West Virginia

Silver Jackets

Regional

The U.S. Army Corps of Engineers provides strong technical services through a variety of programs to address an array of water resources issues in the Chesapeake Bay region. The National Hurricane, Continuing Authorities, Rehabilitation and Inspection, Floodplain Management Services, Planning Assistance to States, and Silver Jackets programs grant the Corps the ability to provide technical water resources services through federal funding or a combination of federal and local funding. This booklet showcases one unique project for each state and the District of Columbia in the Chesapeake Bay watershed.

U.S. Army Corps of Engineers
Technical Service Programs

Corporate Communications Office
July 2015

District of Columbia and Maryland

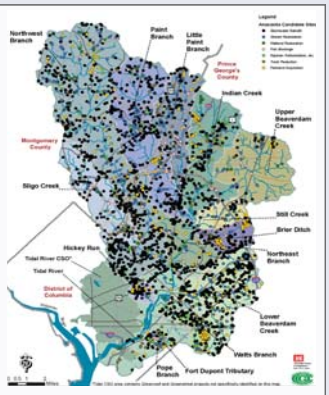
General Investigations Program

Anacostia Restoration Plan

Project Description: The 2010 Anacostia Restoration Plan (ARP) is the product of a two-year planning effort to produce a 10-year restoration plan for ecological restoration within the Anacostia River watershed - a tributary to the Potomac River.

The Anacostia watershed is one of the most urbanized watersheds within the Chesapeake Bay. The Corps worked with stakeholders to develop a plan to protect, improve and restore the watershed. This collaboration resulted in the development of the ARP, which identified over 3,000 projects for implementation by our partners, including follow-on ecosystem restoration studies with Prince George's and Montgomery counties in Maryland. These studies include investigations of stream restoration and fish passage opportunities.

The ARP and follow-on studies by the Corps were conducted under the Corps' General Investigations (GI) Program. Through the GI program, the Corps jointly conducts a water resources study with a non-federal sponsor. Congress may authorize and fund the project if a Corps' recommendation is found to be feasible.



Partners: The Metropolitan Washington Council of Governments helped establish partnerships with local and state jurisdictions - Montgomery and Prince George's Counties in Maryland, the District of Columbia, Maryland Department of Environment, and the Maryland Department of Natural Resources

Cost Share: Approximately $1.48 million federal, $450,000 non-federal, and $1.03 million non-federal in-kind services

Feasibility studies are cost-shared 50 percent federal and 50 percent non-federal. The non-federal partner provides their share in cash, in-kind services, or a combination of both. Ecosystem restoration project implementation is cost-shared 65 percent federal and 35 percent non-federal.

Delaware

National Hurricane Program

Evacuation Planning

The Baltimore District is home to the Hurricane Program Office, which centrally manages all Corps technical support as part of the Federal Emergency Management Agency's (FEMA) National Hurricane Program. Within this program, the Corps and FEMA work with the National Oceanic and Atmospheric Administration (NOAA) to conduct hurricane evacuation studies with the ultimate goal of helping local communities understand their evacuation timeline. Two example projects are outlined below.

Project Description: The Corps teaches an annual HURREVAC training refresher class for state and local emergency managers at the Delaware Emergency Management Agency - Emergency Operations Center in Smyrna, Del.

HURREVAC is a computer software program that allows emergency managers to track hurricanes, view official forecast information, analyze potential risks, and receive evacuation-timing guidance. It is a product of the National Hurricane Program, which is a multi-agency partnership between FEMA, the Corps, and NOAA- National Hurricane Center. The Corps is responsible for executing the operation and maintenance of the software, as well as administering the training program.

Partner: State of Delaware

Cost Share: $2,500 federal, cost of hosting the training

Project Description: In 2012, the Baltimore District worked with the Philadelphia District to update the hazards analysis portion of the Delaware Hurricane Evacuation Study that provides valuable information on vulnerability, public evacuation behavior, and shelter demand that aid hurricane planning and ultimately result in the calculation of evacuation clearance times.

This update was based on the 'Sea, Lake, and Overland Surge from Hurricanes' model, which the National Hurricane Center uses to predict storm surge for an approaching hurricane. The areas in Delaware at risk from storm surge flooding were identified using Geographic Information Systems (GIS) software and placed on risk maps. State and local officials in Delaware use these maps to understand where hurricane evacuations may need to occur, in order to be better prepared for the next storm.

Partners: FEMA, NOAA, Delaware Emergency Management Agency, local county emergency management offices

Cost Share: $50,000 federal, $0 non-federal

Maryland

Continuing Authorities Program

Aquatic Ecosystem Restoration

Project Description: Paint Branch is an ecosystem restoration project within the Anacostia River watershed in Prince George's County.

The restoration area includes six miles of migratory fish passage for blueback and alewife herring and approximately one mile of stream habitat for resident and migratory fish to spawn.

Fish passage was achieved by raising the streambed downstream of a blockage. Successful spawning habitat consists of hiding places or shelter for the fish during floods and areas of both deep and shallow pools.

The aquatic ecosystem was stabilized and restored through reconnecting the stream to its floodplain, channel realignment and strategic placement of in-stream structures like rocks for grade control and pool creation.

Through the Continuing Authorities Program (CAP), Congress has given the Corps the authority to plan, design, and construct projects for ecosystem restoration, navigation, beneficial use of dredged material, and more. The basic objective of this program is to allow the Corps to respond more quickly to problems or needs in which the project scope and costs are roughly $10 million or less.

Partner: Prince George's County Department of the Environment

Cost Share: Approximately $4.2 million federal, $2.15 million non-federal

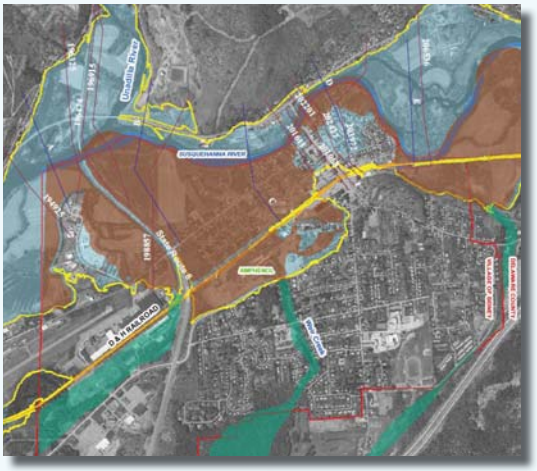
CAP studies are cost-shared 50 percent federal and 50 percent non-federal. Construction is generally cost-shared 65 percent federal and 35 percent non-federal. The non-federal share may be provided with work-in-kind, cash, or a combination of both.

New York

Floodplain Management Services

Flood Risk Management Studies

Project Description: The Corps investigated flooding issues and flood risk management options for the Village of Sidney in Delaware County, N.Y.



The study focused on Weir Creek located on the south side of the Delaware and Hudson Railroad, and the entire Village of Sidney that sits near the Susquehanna River.

Various flood risk management alternatives were evaluated to potentially mitigate for flooding in each area. Options included flow diversion, levees, floodwalls, pump stations, culvert installation, flood proofing, and modifications to channels and bridges.

The Floodplain Management Services (FPMS) Program authorizes the Corps to provide technical assistance and analyses to federal, state, and local agencies on floodplain management related issues.

Assistance includes modeling and mapping, preparedness and response plans, outreach materials, and more.

Products may be completed with all federal funding or in combination with voluntary contributions from a non-federal partner.

Cost Share: $300,000 federal, $0 non-federal

Pennsylvania

Rehabilitation and Inspection Program

Flood Risk Management and Rehabilitation

Project Description: The Corps completed repairs to a retention wall in the Borough of Danville that was damaged by Tropical Storm Lee in September 2011. The rehabilitation restored the level of managed flood risk to the Borough of Danville that existed prior to the flood event.

The wall is part of the Danville flood risk management project, which is a non-federal project designed and constructed under the authority of the Pennsylvania Department of Environmental Protection flood control program to reduce the risk of flooding from the North Branch of the Susquehanna River, Mahoning Creek, and tributaries.

Projects eligible under the authority of Public Law 84-99, Flood Control and Coastal Emergencies, Rehabilitation and Inspection Program (RIP) may be rehabilitated to pre-disaster condition following a storm.

Partner: Borough of Danville

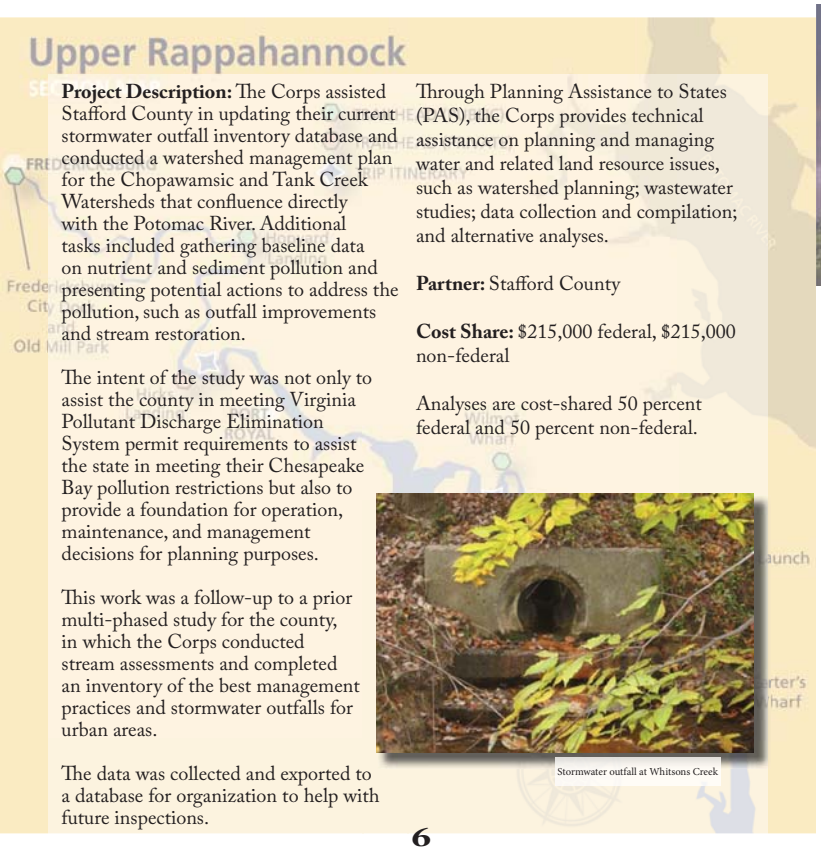
Cost Share: $1.1 million federal, $275,224 non-federal

Rehabilitation projects for non-federal flood risk management projects are cost-shared 80 percent federal and 20 percent non-federal. The non-federal share may be provided with work-in-kind, cash, or a combination of both. Federal flood risk management projects are repaired at 100 percent federal cost.

Virginia

Planning Assistance to States

Water Resources Management



Project Description: The Corps assisted Stafford County in updating their current stormwater outfall inventory database and conducted a watershed management plan for the Chopawamsic and Tank Creek Watersheds that confluence directly with the Potomac River. Additional tasks included gathering baseline data on nutrient and sediment pollution and presenting potential actions to address the pollution, such as outfall improvements and stream restoration.

The intent of the study was not only to assist the county in meeting Virginia Pollutant Discharge Elimination System permit requirements to assist the state in meeting their Chesapeake Bay pollution restrictions but also to provide a foundation for operation, maintenance, and management decisions for planning purposes.

This work was a follow-up to a prior multi-phased study for the county, in which the Corps conducted stream assessments and completed an inventory of the best management practices and stormwater outfalls for urban areas.

The data was collected and exported to a database for organization to help with future inspections.

Through Planning Assistance to States (PAS), the Corps provides technical assistance on planning and managing water and related land resource issues, such as watershed planning; wastewater studies; data collection and compilation; and alternative analyses.

Partner: Stafford County

Cost Share: $215,000 federal, $215,000 non-federal

Analyses are cost-shared 50 percent federal and 50 percent non-federal.

Stormwater outfall at Whitsons Creek

West Virginia

Environmental Infrastructure Program

Morgan County Courthouse Geothermal Project

Project Description: In 2011, the Corps completed the design and construction of approximately 200 linear feet of culvert and a geothermal heat exchanger for a new courthouse building in Berkeley Springs. The system uses warm spring stream water to heat and cool the building.

This project is part of the Corps' Environmental Infrastructure program that provides for the design and construction of water-related environmental infrastructure and resource protection and development projects for non-federal interests in 20 West Virginia counties.

Partner: Morgan County Commission

Cost Share: $225,000 federal, $75,000 non-federal

Design and construction assistance within the Environmental Infrastructure program is cost-shared 75 percent federal and 25 percent non-federal.

SILVER JACKETS Many Agencies One Solution

Interagency Floodfighting Teams

The Silver Jackets are interagency teams typically comprised of state, federal, regional and local agencies that work together to reduce flood risks.

Vision Statement
Establish and strengthen partnerships as a catalyst in developing and implementing comprehensive, resilient, and sustainable solutions to local flood-hazard challenges.

Goals
- Ensure continuous collaboration before, during, and after a flood
- Identify and quantify flood risk
- Provide assistance in implementing projects
- Improve outreach on flood risk

As an example, the Pennsylvania Silver Jackets Team worked on flood inundation maps for Harrisburg, Pa.

Data may be used by emergency managers for actions related to evacuation, road closure points, and shutting down power grids. The map covers 20 communities along the Susquehanna River.

Partners: U.S. Geological Survey, National Weather Service, Susquehanna River Basin Commission, The Harrisburg Authority, FEMA, Pennsylvania Emergency Management Agency

Cost Share: $117,000 federal, $130,000 non-federal (some in-kind services)

Regional

Oyster Restoration Program

Project Description: The Corps is restoring oyster reefs in Maryland and Virginia. This project contributes to a large-scale effort through Executive Order 13508 and the Chesapeake Bay Agreement to restore native oyster populations in 10 Chesapeake Bay tributaries by 2025.

In Maryland, the Baltimore District is working with its partners to restore oyster habitat in Harris Creek, Little Choptank River, and Tred Avon River. In Virginia, the Norfolk District is working with its partners to restore oyster habitat in Piankatank, Lafeyette, Great Wicomico, and Lynnhaven.

Through the interagency partnership, the State of Maryland has planted more than a billion oysters through 370 acres of restored habitat in the Harris Creek Sanctuary since 2011. Since restoration efforts started, areas with less than one oyster per square meter now have upward of 25 oysters per square meter.

Maryland Partners: Maryland Department of Natural Resources, National Oceanic and Atmospheric Administration, Oyster Receovery Partnership

The Norfolk District has constructed approximately 58 acres of oyster reefs in the Lynnhaven River since 2006. The river is demonstrating improvement in water quality and a significant increase in aquaculture.

Virginia Partners: Virginia Marine Resources Commission. Additional partners include the City of Virginia Beach, Chesapeake Bay Foundation, Lynnhaven River NOW

Cost Share: $5 million federal, $1.25 million non-federal via in-kind fossil shell

The U.S. Army Corps of Engineers, Baltimore District, places shell to restore oyster reefs in the Chesapeake Bay tributary of Harris Creek, April 1, 2015.

U.S. Army Corps of Engineers'
Mission

Provide vital public engineering services in peace and war to strengthen our Nation's security, energize the economy, and reduce risks from disasters.

U.S. Army Corps of Engineers'
Vision

A GREAT engineering force of highly disciplined people working with our partners through disciplined thought and action to deliver innovative and sustainable solutions to the Nation's engineering challenges.

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