

Choptank Restorative Operation Plan (CROP)

Team 1:

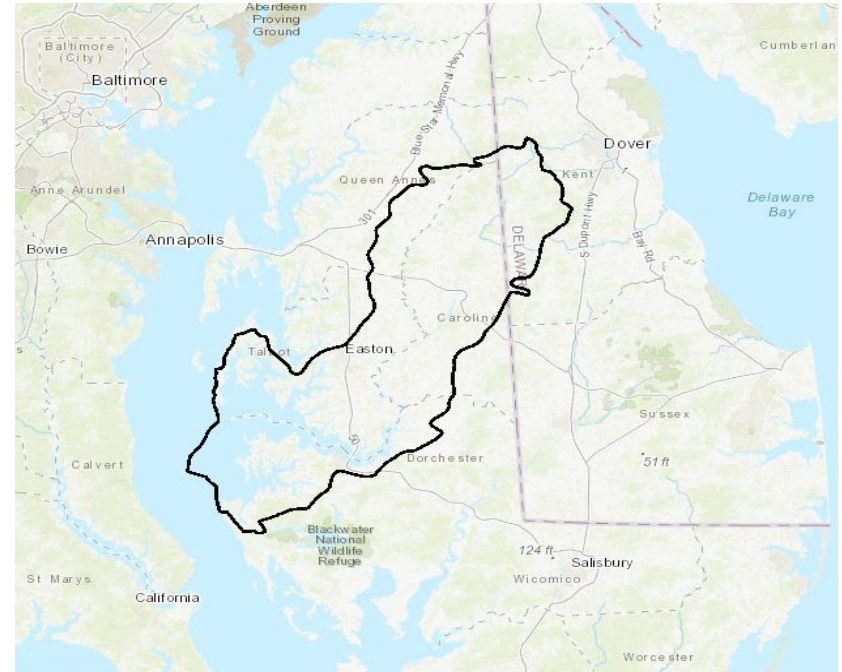
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Mission Statement

CROP's goal is to mitigate the problems of pollution, erosion, and wetland degradation by the year 2050 and provide recommendations to protect, restore, and maintain the Choptank River Basin to fishable and swimmable standards to better the environment of its tributaries.

History/Watershed Description

- The Choptank River watershed is a major tributary of the Chesapeake Bay and is located on the Delmarva Peninsula spanning between both Delaware and Maryland.
- The Choptank River runs for 71 miles beginning in Kent County Delaware and flowing southwest until it eventually ends in the Chesapeake Bay separating Talbot County, Caroline County, and Dorchester County in Maryland.
- The name “Choptank” comes from an Algonquin tribe who lived in the southern portion of watershed.
- The Watershed is approximately 1,000 square miles and consists of 58 percent agricultural land, 33 percent forested land, and 9 percent urban land.
- The topography is especially flat, causing farmers to utilize a network of drainage ditches to facilitate movement of water into streams.



Problems/Issues

Problem # 1: Non- Source Pollution

- Portions of the Choptank River have been identified as “impaired waters” according to the Clean Water Act due to the high levels of nutrients and sediments.
- The growing of the crops themselves and AFOs produce pollutants throughout the watershed these pollutants runoff into ditches, streams, estuaries, and into the Choptank River which eventually leads into the Chesapeake Bay.
- Some of the potential pollutants from crops, animal products, and husbandry include nutrients, arsenic, and non-indigenous microorganisms. This includes nitrogen and phosphorus runoffs. Although nitrogen and phosphorus are nutrients that are essential for cell-functions, excess can lead to adverse effects such as population booms of aquatic plants (eutrophication) and algae blooms which can kill fish and other wildlife.

Problems/Issues cont.

Problem #2: Erosion

- Erosion of shorelines can contribute significant amounts of nutrients (mostly phosphorus) and sediment (water column turbidity, habitat loss.) Typically unpolluted streams and tidal waters have limited amounts of sediment moving “suspended” in the water.

Problem #3: Wetland Degradation

- 50 percent of the wetlands that once dominated the landscape of the Choptank River Basin has been drained to make way for the production of crops over the last 400 years of ditch drainage history.
- The losses due to draining, filling, etc has led to habitat loss and negatively impacted the water quality.

Goals/Objectives

Goal #1: Reducing Nonpoint Source Pollution

- Utilize conservation practices that are proven to be most effective based upon the research and the recommendations of the Maryland Department of the Environment (MDE).
- Management practices that we aim to implement include: cover crops, crop residue management, nutrient management, ditch drainage management, field borders, filter strips, riparian forest buffers, streambank/ shoreline protection, tree/ shrub establishment, wetland management and restoration
- A key component of CROP is to monitor and collect data on these BMPs to enlarge our database, determine the most effective BMPs and to determine the amount of maintenance required to run them optimally.

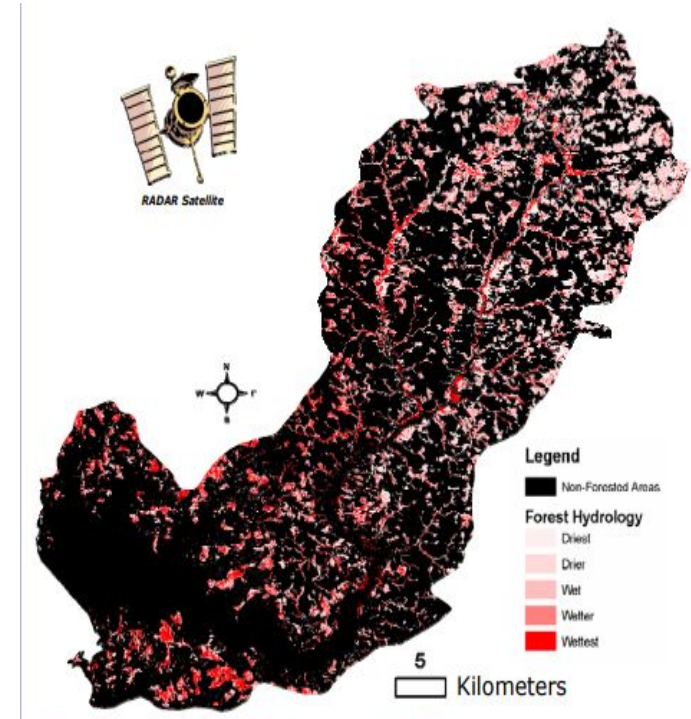
Goal #2: Reduce Erosion & Sediment Transfer

- In areas with light erosion problems, replanting with vegetation and covering with mulch are good solutions. For heavy erosion in areas of concentrated flow, the most effective solutions are check dams or terraces. Ideally, this would be done following the Maryland Department of Environment's regulations and Buffer Management Plan (BMP).

Goals/Objectives cont

Goal #3: Wetland Restoration

- Wetland restoration sites involves identifying “historic” wetland areas, and restoring them in the context of the Wetland Restoration Action Strategy (WRAS).
- CHOP aims to work alongside conservation specialists, extension agents, scientists, and surveyors to develop accurate mapping and monitoring strategies of existing forested wetlands.
- This is done through traditional means such as survey, or being flexible and adapting to new methods of revealing and monitoring wetlands such as the synthetic aperture radar.



Regulations/Ordinances - State



DELAWARE DEPARTMENT OF
AGRICULTURE



Maryland
Department of
the Environment

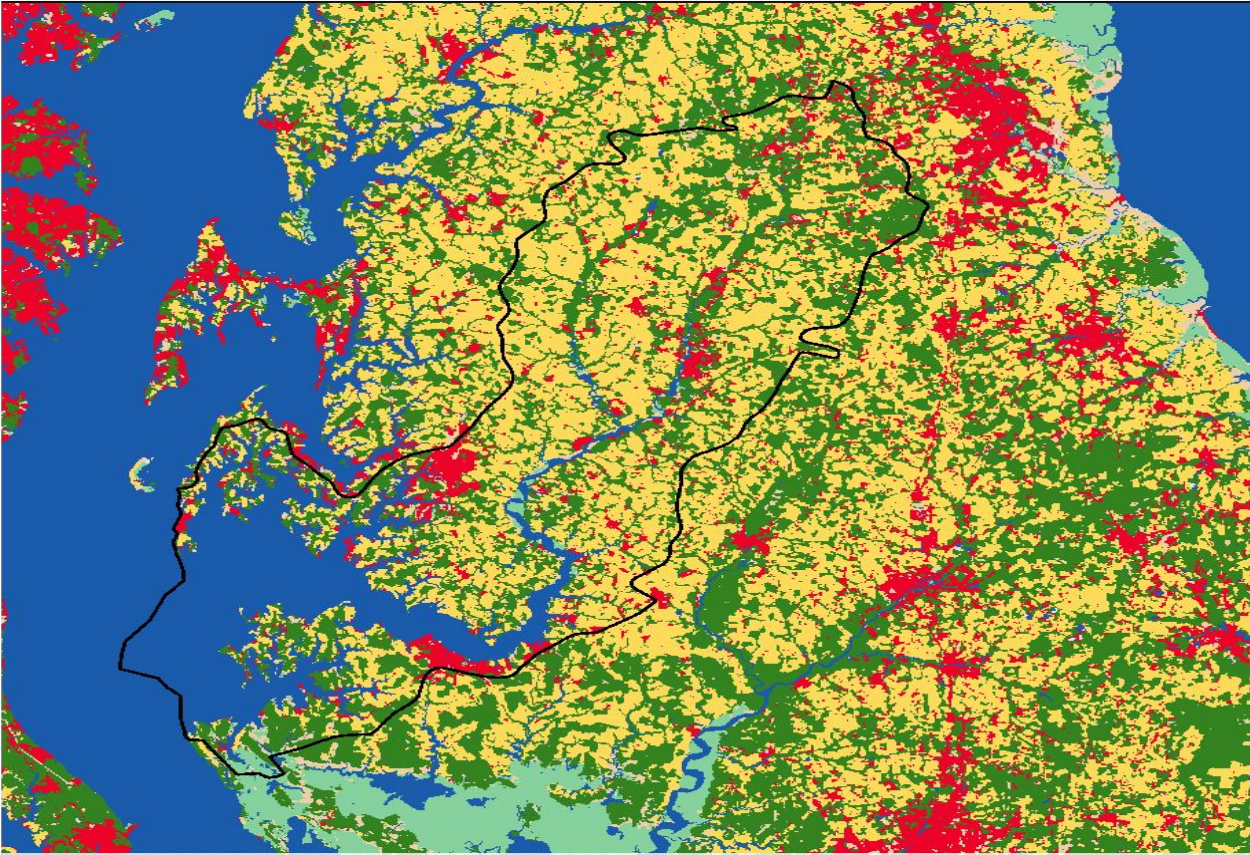
- The Choptank River Watershed spans two states, therefore both Delaware and Maryland are responsible for their respective areas of the watershed.
- Each of the state departments and agencies have their own laws and regulations for what can happen to the watershed.
- These laws can sometimes clash with the regulations state to state, so collaboration is very important for the safety of the river.

Regulations/Ordinances - Federal

- The federal government has set laws and executive orders that all states must follow.
- The United States Environmental Protection Agency (EPA) is responsible for many of the main laws and regulations that affect the watershed such as:
 - Clean Water Act
 - National Environmental Policy Act
 - Endangered Species Act
- The United States Department of Agriculture is another federal department that sets regulations which directly affect the watershed due to the high agricultural land use in the watershed.



GIS Watershed Inventory - Land Use/Land Cover



- No Data
- Water
- Trees
- Flooded Vegetation
- Crops
- Built Area
- Bare Ground
- Snow/Ice
- Clouds
- Rangeland

GIS Watershed Inventory - National Riparian Areas Map



Alternative Analysis

#1: To assist in reducing erosion along the streambanks of the watershed:

- The method we suggest is stream restoration projects in areas where erosion is both heavy and restoration is possible.
- Common methods are mending sharp bends in the stream, constructing veins to maximize to naturally redistribute flow to the natural channel, and other bio-retention facilities to keep the flow docile and clean. While an extremely effective method it's also expensive.

#2: To reduce nonpoint source pollution:

- Working with companies to clean the current pollutants that sit in our water is an expensive solution and is best used when suspended pollutants cannot naturally be removed through the primary methods.

#3: Working with the neighboring community:

- Getting the community to enact system wide change to protect the rivers and streams on the local, state, and federal level is best to maintain and restore the health of the Choptop River basin.

Conclusion/Recommendations

- The Choptank River is one of the main tributaries in the Chesapeake Bay.
- It spans approximately 1,000 square miles between Delaware and Maryland.
- Majority of the land use is cropland, which is the main contributor to the problems the watershed face such as non-point source pollution, erosion, and wetland degradation.
- CROP has offered recommendations to address these issues and plan to work with federal, state, and private organizations to ensure these goals are achieved.