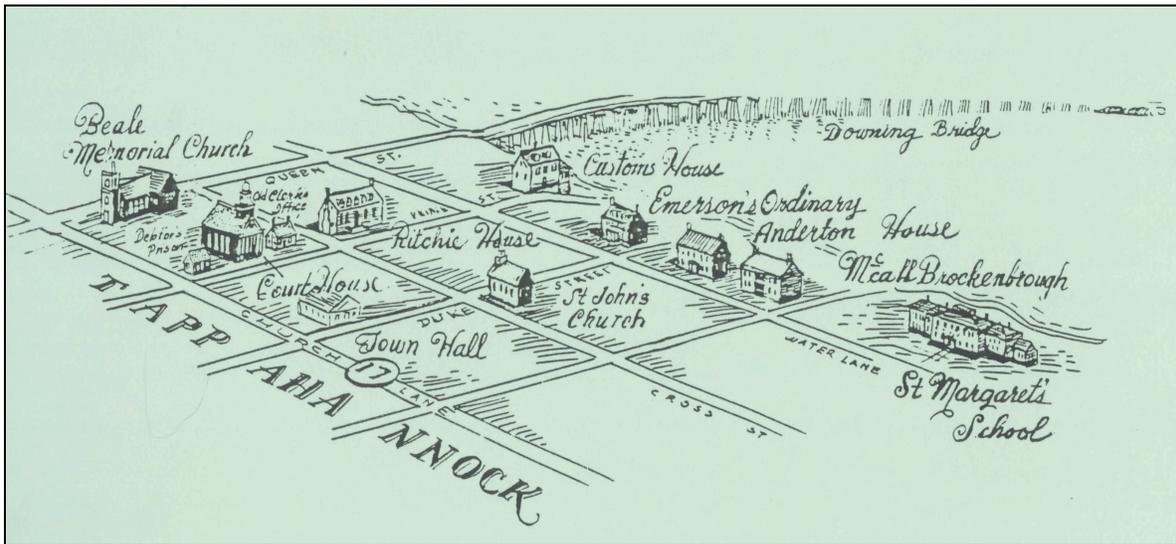


Tappahannock, Virginia

Comprehensive Plan

Chapter 5- Addendum



ENVIRONMENTAL PROTECTION

Shoreline Erosion and Water Quality Issues

Adopted by Tappahannock Town Council
December 10, 2001

Chapter 5- Addendum

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Chapter 5- Addendum

ENVIRONMENTAL PROTECTION

Shoreline Erosion and Water Quality Issues

BACKGROUND AND ANALYSIS

In 2000 the Chesapeake Bay Local Assistance Board reviewed the Town of Tappahannock's Comprehensive Plan and identified two areas for further discussion. Shoreline erosion and groundwater issues will be addressed within this addendum and will serve as a supplement to Chapter 5 of the Town's Comprehensive Plan, titled Shoreline Erosion -Water Quality Issues.

The 1998 Comprehensive Plan for the Town indicated a need for additional shoreline management and groundwater and surface water planning and management. As a result, two strategies have emerged. The Virginia Institute of Marine Science Comprehensive Coastal Inventory Program has undertaken an Essex County Shoreline Situation Report and will serve as a tool to identify shoreline issues within the Town. The Middle Peninsula Planning District Commission has formed a subcommittee named the Middle Peninsula's Water Resource Study Committee. This committee has completed a strategic plan for each Middle Peninsula Town and County addressing Groundwater and Surface Water issues and recommendations. The Town of Tappahannock and Essex County have collaborated together to comprehensively approach water resource issues. As such, many of the issues, suggestions, and recommendations cross jurisdictional lines.

Shoreline Erosion and Water Quality are important to the Town of Tappahannock; residents take pride in the beautiful Rappahannock and support its preservation. To that end, the following are offered as strategies for addressing these issues:

Shoreline Erosion

The 1998 Comprehensive Plan for the Town of Tappahannock indicated a need for coordinated collaboration between the Middle Peninsula Planning District Commission (MPPDC) and the Virginia Institute of Marine Science (VIMS) to develop a comprehensive shoreline management plan. The Town recognizes shorelines as a valuable asset and should be managed appropriately. With financial assistance from the Chesapeake Bay Local Assistance Department, Essex County and the Town of Tappahannock were surveyed for a comprehensive shoreline situation report.

Since the Town of Tappahannock is bordered by the Rappahannock River and contains both Tickners and Hoskins Creeks, shoreline erosion management is of critical concern. Soil erosion along shorelines occurs when water or wind carries off soil particles. The transport

of soil particles is generally referred to as runoff. Runoff can wash fertilizer and other pollutants into Hoskins Creek and the Rappahannock River and should be kept to a minimum. The Town uses the Virginia Erosion and Sediment Control Handbook for guidance related to overland flow and erosion control. Additionally, the Department of Conservation and Recreation's Shoreline and Erosion Advisory Services (SEAS) provides guidance for tidal and non-tidal erosion. Interested parties are encouraged to visit www.state.va.us/~dcr/sw/seas.htm for additional information. The following characteristics generally identify erosion activity:

- Bare spots on land
- Exposed roots
- Small rills or gullies on slopes
- Sediment collects in low areas

Shoreline and streambank erosion are caused by wave and water energy, and can vary from low to moderate or high levels. Permanent structures, such as bulkheads and revetments, have been established along many parts of the Town's shoreline where moderate to high levels of erosion occur. Permanent erosion control structures built in the past have sometimes caused the erosion of downstream wetlands and the disappearance of downstream beaches, as the movement of sand or sediments is impeded by these structures. Unified treatment of whole reaches of shoreline can improve opportunities to assure that solutions to erosion conditions on one site do not create greater rates of erosion on adjacent sites.

Shorefronts subject to low and moderate rates of erosion may often represent candidate sites for non-structural shore protection through the use of wetland plantings and sills (continuous small rock breakwaters used to slow wave energy to establish inter-tidal marshes). Marsh vegetation and plantings in such areas can provide long term stabilization at a fraction of the cost of conventional structures such as bulkheads and stone revetments. Such treatment of shore erosion conditions also improves water quality and increases habitat availability.

The Virginia Institute of Marine Science completed a shoreline and erosion study of Essex County and the Town of Tappahannock in 2001. Several classifications of erosion are present along the shoreline of the Town boundary, but there are few areas where high erosion rates are present ([APPENDIX A](#)).

Most of the Town shoreline along the Rappahannock River has minimal erosion activity. The majority of the river shoreline is classified as greater than 10 ft bank height/low erosion. One 500 ft section around the Route 360 Bridge is classified as 0-5 ft bank height/low erosion area. Two small sections totaling 300 ft are classified as 5-10 ft bank height/low erosion area. The shoreline also includes about 400 ft of beach/low erosion area around the Route 360 Bridge and 1000 ft of marsh/low erosion area near Tickners Creek. Most of the shoreline is hardened. Bulkheads are the most common form of hardening. Groinfields are found along 1000 ft of shoreline and there are scattered sections of riprap. There are numerous piers and wharfs along the river.

Hoskins Creek has several levels of erosion activity. The majority of shoreline is classified as 0-5 ft bank height /low erosion with marsh conditions. Two sections with a total of 2000 ft of shoreline are classified as 5-10 ft bank height/low erosion. Two shorter sections totaling about

400 ft are classified as greater than 10ft bank height/low erosion. There are two isolated sections of high erosion, one with bank heights from 5-10 ft and one with bank heights greater than 10ft. These areas contain bulkheads, one associated with a pier and one with a boathouse. Bulkheads are present on the north shore near the mouth of the creek and there is a small bulkhead on the south shore. There are many piers and boathouses along this section of the creek.

Tickners Creek has two levels of erosion activity. Most of the shoreline is classified as 0-5 ft bank height/low erosion with marsh conditions. There is a 100 ft section of 0-5 ft bank height/high erosion associated with riprap on the north side of the creek. This area is found on the downdrift side of a jetty at the mouth of the creek. There is a marina on the south side of the creek.

Overall the Town does not view erosion as a problem. However, if at such time erosion activities expand or citizens request assistance in dealing with erosion issues, Town staff will be available to assist citizens with mitigation strategies.

It should be noted that the 2001 erosion study of Essex County and the Town of Tappahannock did not contain data addressing the condition of shoreline structures or how these structures impact water quality. The Town will assist VIMS in the future with the collection and assessment of this data.

Water Quality Issues

Given the population served by the Town's municipal water supply facilities and expected growth in the Town, it is the policy of the Town that potential sources and effects of pollution on the Town's water supply be investigated. Sources may include storm water runoff, leaking petroleum storage tanks, abandoned wells, former refuse sites, and on-site sewage deficiencies. Since the last comprehensive plan update, the Town has taken many proactive steps addressing water quality issues. Elected, appointed and citizen representatives from the Town participated in a two year planning process facilitated by staff from the Middle Peninsula Planning District Commission. The mission was to research, educate, and promote action for the management, conservation, and protection of the Middle Peninsula's water resources. Town representatives undertook a Strengths–Weaknesses–Opportunities-and-Threats (SWOT) analysis and developed a management / recommendation plan for consideration by Town Government ([APPENDIX B](#)). Committee members from the Town comprehensively analyzed water quality issues from the following areas: water resources, contaminations and threats, and local planning tool effectiveness. Each section illustrates what participants viewed as important groundwater and surface water issues. Town council is considering final recommendations for adoption.

Town of Tappahannock Recommendations

- The town should explore developing controls for future high volume water users

- The town should institute education efforts to inform the general public about contamination and threats to water resources
- The town should develop an amnesty day for the disposal of unwanted chemicals, home hazardous waste, fertilizers etc.

The Town considers these recommendations critical to providing safe ground and surface water for the residents. The Town will continue to work towards addressing all elements identified in the SWOT analysis using a proactive planning process. The Town Council understands that many types of land uses and the practices within the Town can affect the quality of both surface and ground water supplies. Runoff from lands adjacent to surface water reservoirs may contain chemical and biological contaminants. Pollutants can originate from agricultural practices, residential lawn care, pesticides, petroleum spills, and failing septic systems. Groundwater can be contaminated by these sources by infiltration through the soil to the water table.

The Department of Environmental Quality (DEQ) currently monitors above and below ground petroleum storage tanks in the Town of Tappahannock. As of April 21, 2001 DEQ, records indicate 4 registered active monitored tanks (map 1). Of the 4 tanks, 3 show leakage and 1 tank is scheduled to be closed pending administrative process. Specific site information can be obtained from the Department of Environmental Quality web site at WWW.deq.state.va.us/tanks/ or by calling the Department of Environmental Quality Piedmont Regional Office.

In an effort to address leaking underground storage tanks and other pollutant sources and improve the quality of water resources within the Town of Tappahannock, the Town will:

- Work with the Department of Environmental Quality to develop appropriate programs to mitigate any water quality problems associated with leaking petroleum storage tanks
- Work with Town business or residents to develop appropriate mitigation strategies on a case by case basis
- Explore the development of a Wellhead protection ordinance
- Conduct a town wide survey asking residents to locate abandoned wells
- Develop a program to provide these citizens with assistance for well closure

On-site wastewater failures have been practically eliminated within the town. Water and sewer service is available town wide. Five to ten on-site septic systems remain within the Town (Map 1). At such time when these systems require repair, it is the policy of the Town to investigate the cost of public service hook up or directing the homeowner to the Middle Peninsula Planning District Commission's On-site Wastewater Revolving Loan Program which offers financial assistants for the repair or replacement of failing on-site systems. The Town desires to have 100% public water and sewer hookup town wide or when necessary require engineered on-site waste treatment systems with the Town overseeing operation and maintenance. This strategy will ensure 100% public sewer management by the Town.

The Town is sensitive to the role water conservation plays in the community. Groundwater protection and conservation is an incremental process. There are seldom any fast solutions.

Rather, step-by-step changes lead to strong and lasting results. Community leadership will be responsible for developing, coordinating, and implementing the conservation activities. Following on the recommendation to inform the general public about contamination and threats to water resources, the Town will look towards the Middle Peninsula Planning District Commission's Water Resource Program to provide guidance to the Town. MPPDC's Water Resource Program has received financial assistance from the Department of Health, Drinking Water State Revolving Fund Program. The PDC will be introducing localities to the Groundwater Guardian Program. This program supports, recognizes, and connects communities protecting groundwater. It is designed to empower local citizens and communities to take voluntary steps toward protecting their groundwater resources. Groundwater Guardian can be a catalyst for groundwater protection programs such as a local wellhead protection or a source water protection program.

The Town welcomes the opportunity to introduce the citizens and businesses to a citizen based conservations program to help protect and manage the water resources of the Town.

Town of Tappahannock: Shoreline Erosion and Water Quality

Goals and Objectives

Shoreline Erosion

Goal:

- To minimize shoreline erosion activity.

Objectives:

- When financial resources are identified, the Town will conduct a “Reach Assessment” study to determine where erosion process and response mutually interact. The reach assessment achieve the following:
 - Determine the reach limits.
 - Determine historic rate and pattern of erosion and accretion for the reach.
 - Determine within the reach which sites supply sand.
 - Determine wave climate and the direction of net littoral sand drift.
 - Identify factors causing erosion, and other than waves.
 - Estimate potential and active sources of nutrient loading (nutrients do not impact erosion, but do impact water quality).

Goal:

- To protect wetlands and other natural resources from erosion due to increased drainage, filling, or construction.

Objectives:

- The Town will encourage the use of non-structural shore line protection such as wetland plantings and sills to provide long term protection;
- The Town will promote unified treatment of shoreline to assure that solutions to erosion conditions on one site do not create greater rates of erosion on adjacent sites;
- The Town will use Best Management Practices that minimize land disturbance;
- The Town will recommend minimizing of site clear-cutting during development.

Water Quality

Goal:

- To develop educational programs to promote conservation of the Town's natural resources and community assets.

Objectives:

- The Town will undertake community level education programs to promote better understanding of high water table issues;
- The Town will develop educational programs about proper fertilizer application, safe disposal of hazardous household and toxic industrial waste, and the necessity of inventorying and monitoring underground storage tanks.

Goal:

- To protect groundwater and surface water from pollution, sedimentation, and depletion.

Objectives:

- The Town will consider repair or replacement of older sections of municipal water system;
- The Town will promote waste water connection of remaining houses to municipal water system;
- The Town will work with the Department of Environmental Quality to identify leaking underground/petroleum storage tanks and mitigate any associated water quality problems;
- The Town will conduct a town wide survey asking residents to locate abandoned wells;
- The Town will develop a program to provide citizens with assistance for well closure;
- The Town will develop an amnesty day for the disposal of unwanted chemicals, home hazardous waste, fertilizers etc.

Goal:

- To conserve natural resources and forested lands by guiding residential, commercial, and industrial development to areas suitable for growth.

Objectives:

- The Town will update the Town's Subdivision and Zoning Ordinances to allow open space /cluster development.

Goal:

- To work with local, regional, state, and federal agencies to implement policies to protect Tappahannock's natural resources.

Objectives:

- The Town will work with local businesses or residents to assess development impacts and if necessary create appropriate mitigation strategies on a case by case basis;
- The Town will investigate stormwater management strategies associated with development of a waterfront park to use as a demonstration project for innovative storm water management techniques.

Goal:

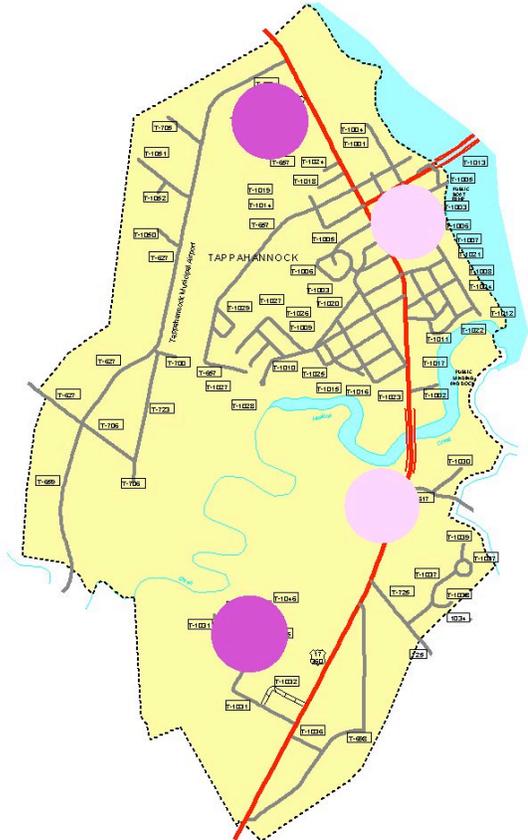
- To revise local ordinances as needed to protect the Town's natural resources.

Objectives:

- The Town will explore the development of a Wellhead protection ordinance;
- The Town will develop policies that address future high volume water users.

Map of Water Quality Issues

Town of Tappahannock Water Quality Issues



Legend

	On-site wastewater facility		Hard Surface
	Leaking petroleum storage tanks		US Highways
	Town		
	Streams		

N


0.5 0 0.5 1 Miles



Town of Tappahannock: Shoreline Erosion and Water Quality

Appendix A

This appendix contains excerpts from a study prepared by the Comprehensive Coastal Inventory Program of the Virginia Institute of Marine Science, College of William and Mary. The data includes shoreline assessment and mapping of shoreline features. For further information, refer to the complete study:

Comprehensive Coastal Inventory Program. *Essex County and the Town of Tappahannock: Shoreline Situation Report*. Gloucester, Va.: Virginia Institute of Marine Science, College of William and Mary, 2001.

CHAPTER 2 - The Shoreline Assessment: Approach and Considerations

2.1 Introduction

The Comprehensive Coastal Inventory Program (CCIP) has developed a set of protocols for describing shoreline conditions along Virginia's tidal shoreline. The assessment approach uses state of the art Global Positioning Systems (GPS) and Geographic Information Systems (GIS) to collect, analyze, and display shoreline conditions. These protocols and techniques have been developed over several years, incorporating suggestions and data needs conveyed by state agency and local government professionals.

These separate activities embody the development of a Shoreline Situation Report; data collection, data processing and analysis, and map generation. Data collection follows a three tiered shoreline assessment approach described below.

2.2 Three Tiered Shoreline Assessment

The data inventory developed for the Shoreline Situation Report is based on a three-tiered shoreline assessment approach. This assessment characterizes conditions in the shoreline, which extends from a narrow portion of the riparian zone seaward to the shoreline. This assessment approach was developed to use observations which could be made from a moving boat. In that end, the survey is a collection of descriptive measurements which characterize conditions. GPS units log location of conditions observed from a boat. No other field measurements are performed.

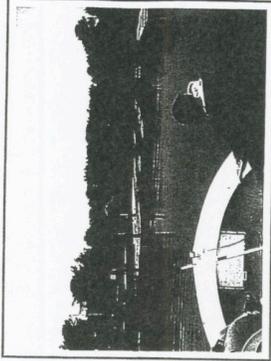
The three tiered shoreline assessment approach divides the shoreline into three regions: 1) the immediate riparian zone, evaluated for land use; 2) the bank, evaluated for height, stability, cover, and natural protection; and 3) the shoreline, describing the presence of shoreline structures for shore protection and recreational purposes. Each tier is described in detail below.

2.2.a) Riparian Land Use: Land use adjacent to the bank is classified into one of eight categories (Table 1). The categories provide a simple assessment of land use, and give rise to land management practices which could be anticipated. GPS is used to measure the linear extent along shore where the practice is observed. The width of this zone is not measured. Riparian forest buffers are considered the primary land use if the buffer width equals or exceeds

30 feet. This width is calculated from digital imagery as part of the quality control in data processing.

2.2.b) Bank Condition: The bank extends off the fastland, and serves as an interface between the upland and the shore. It is a source of sediment and nutrient fluxes from the fastland, and bears many of the upland soil characteristics which determine water quality in receiving waters. Bank stability is important for several reasons. The bank protects the upland from wave energy during storm activity. The faster the bank erodes, the sooner the upland will be at risk. Bank erosion can contribute high sediment loads to the receiving waters. Stability of the bank depends on several factors: height, slope, sediment composition, vegetative cover, and the presence of buffers to absorb energy impact to the bank itself.

The bank assessment in this inventory addresses four major bank characteristics: bank height, bank cover, bank stability, and the presence of stable or unstable natural buffers at the bank toe (Table 2). Conditions are recorded continuously using GPS as the boat moves along the shoreline. The GPS log reflects any changes in conditions observed.



A GPS operator observes shoreline conditions from a shoal draft boat.

Table 1. Tier One - Riparian Land Use Classes

Forest	stands greater than 18 feet / width greater than 30 feet
Scrub-shrub	stands less than 18 feet
Grass	includes grass fields, and pasture land
Agriculture	includes croplands
Residential	includes single or multi family dwellings
Commercial	includes industrial, small business, recreational facilities
Bare	lot cleared to bare soil
Timbered	clear-cuts
Unknown	land use undetectable from the vessel

Bank height is described as a range, measured from the toe of the bank to the top. Bank cover is an assessment of the percent of either vegetative or structural cover in place on the bank face. Natural vegetation, as well as rip rap are considered as cover. The assessment is qualitative (Table 2). Bank stability characterizes the condition of the bank face. Banks which are undercut, have exposed root systems, down vegetation, or exhibit slumping of material qualify as a "high erosion." At the toe of the bank, natural marsh vegetation and/or beach material may be present. These features offer protection to the bank and enhance water quality. Their presence is noted in the field, and a general assessment (low erosion/high erosion) describes whether they are experiencing any erosion. Sediment composition and bank slope cannot be surveyed from a boat, and are not included.

2.2c) Shoreline Features: Features added to the shoreline by property owners are recorded as a combination of points or lines. These features include defense structures, which are constructed to protect shorelines from erosion; offshore structures, designed to accumulate sand in longshore transport; and recreational structures, built to enhance recreational use of the water. The location of these features along the shore are surveyed with a GPS unit. Linear features are surveyed without stopping the boat. Structures such as docks, and boat ramps are point features, and a static ten-second GPS observation is collected at the site. Table 3 summarizes shoreline features surveyed. Linear features are denoted with an "L" and point features are denoted by a "P". The glossary describes these features, and their functional utility along a shore.

2.3 Data Collection/Survey Techniques

Data collection is performed in the field, from a small, shoal draft vessel, navigating at slow speeds parallel to the shoreline. To the extent possible, surveys take place on a rising tide allowing the boat to be as close to shore as possible. The field crew consists of a boat operator, and two data surveyors. The boat operator navigates the boat to follow the shoreline geometry. One surveyor collects information pertinent to land use and bank condition. The second surveyor logs information relevant to shoreline structures.

Data is logged using the handheld Trimble GeoExplorer GPS unit. GeoExplorers are accurate to within 4 inches of true position with extended observations, and differential correction. Both static and kinematic data

Table 2. Tier 2 - Bank Conditions

Bank Attribute	Range	Description
bank height	0-5 ft 5-10 ft > 10 ft	from the toe to the edge of the fastland from the toe to the edge of the fastland from the toe to the edge of the fastland
bank stability	low erosion high erosion	minimal erosion on bank face or toe includes slumping, scarps, exposed roots
bank cover	bare partial total	<25% cover; vegetation or structural cover 25-75% cover; vegetation or structural cover > 75% cover; vegetation or structural cover
marsh buffer	no yes	no marsh vegetation along the bank toe fringe or pocket marsh present at bank toe
marsh stability (if present)	low erosion high erosion	no obvious signs of erosion marsh edge is eroding or vegetation loss
beach buffer	no yes	no sand beach present sand beach present
beach stability (if present)	low erosion high erosion	accreting beach eroding beach or non emergent at low tide

Table 3. Tier 3 - Shoreline Features

Feature	Feature Type	Comments
Control Structures		
rip rap	L	
bulkhead	L	
breakwaters	L	first and last of a series is surveyed
groined	L	first and last of a series is surveyed
jetty	P	
miscellaneous	L	can include tires, rubble, tubes, etc.
Recreational Structures		
pier/wharf	P	includes private and public
boat ramp	P	includes private and public
boat house	P	all covered structures, assumes a pier
marina	L	includes piers, bulkheads, wharfs

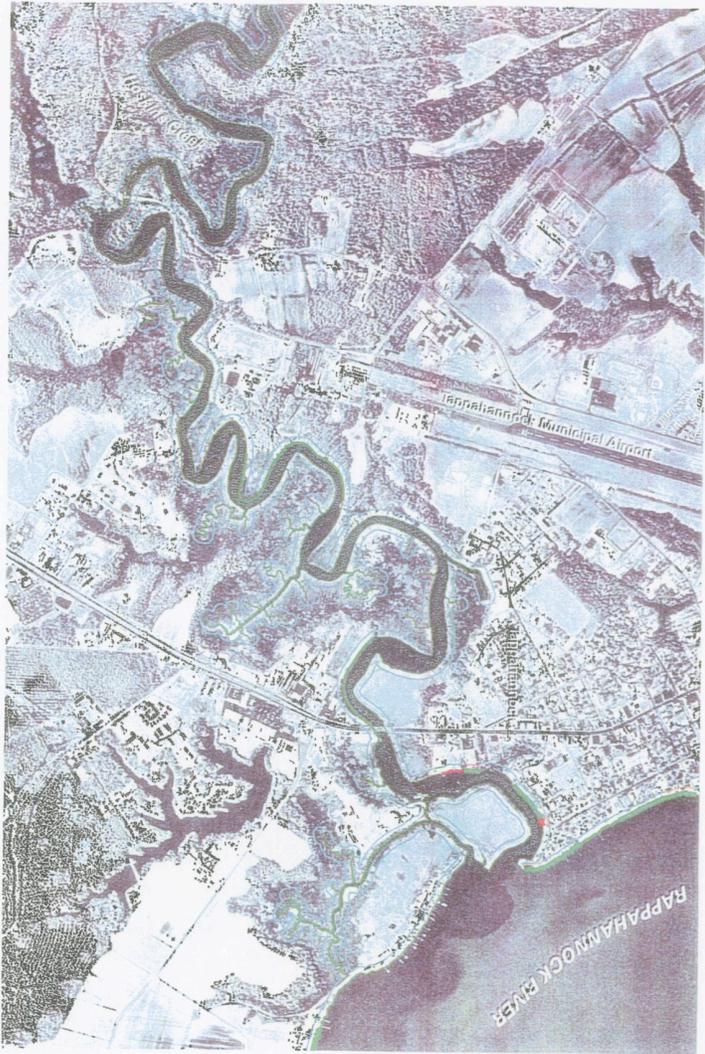
Table 4. Essex County Shoreline Attributes - River Reach Data (Cont)

REACH NUMBER	REACH LENGTH SURVEYED (miles)	RIPARIAN LAND USE (% of reach length surveyed)				SHORELINE FEATURES				BANK			BANK COVER		BUFFER CONDITION															
		forest	scrub-shrub	grass	residential/commercial	bars	agricultural	docks	No. private	No. public	No. man-made	No. piles	No. boulders	No. debris	low	high	low	high	bar	partial	full	Ending	Stable	Ending	Stable					
67	0.13	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
68	0.98	0	18	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
69	2.80	14	18	9	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
70	3.03	68	6	1	29	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
71	0.16	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
72	0.71	56	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Total	316.65***	68.95	20.52	0.43	6.98	0.52	0.10	2.60	396	78	63	2	34	2	7	2.62	1.74	88.77	1.11	5.77	0.42	3.08	0.85	0.48	0.91	98.60	0.52	2.48	0.79	79.23

* boathouses

** boat ramps

*** Total miles of surveyed shorelines for Essex County - 125 miles of which were remotely surveyed.



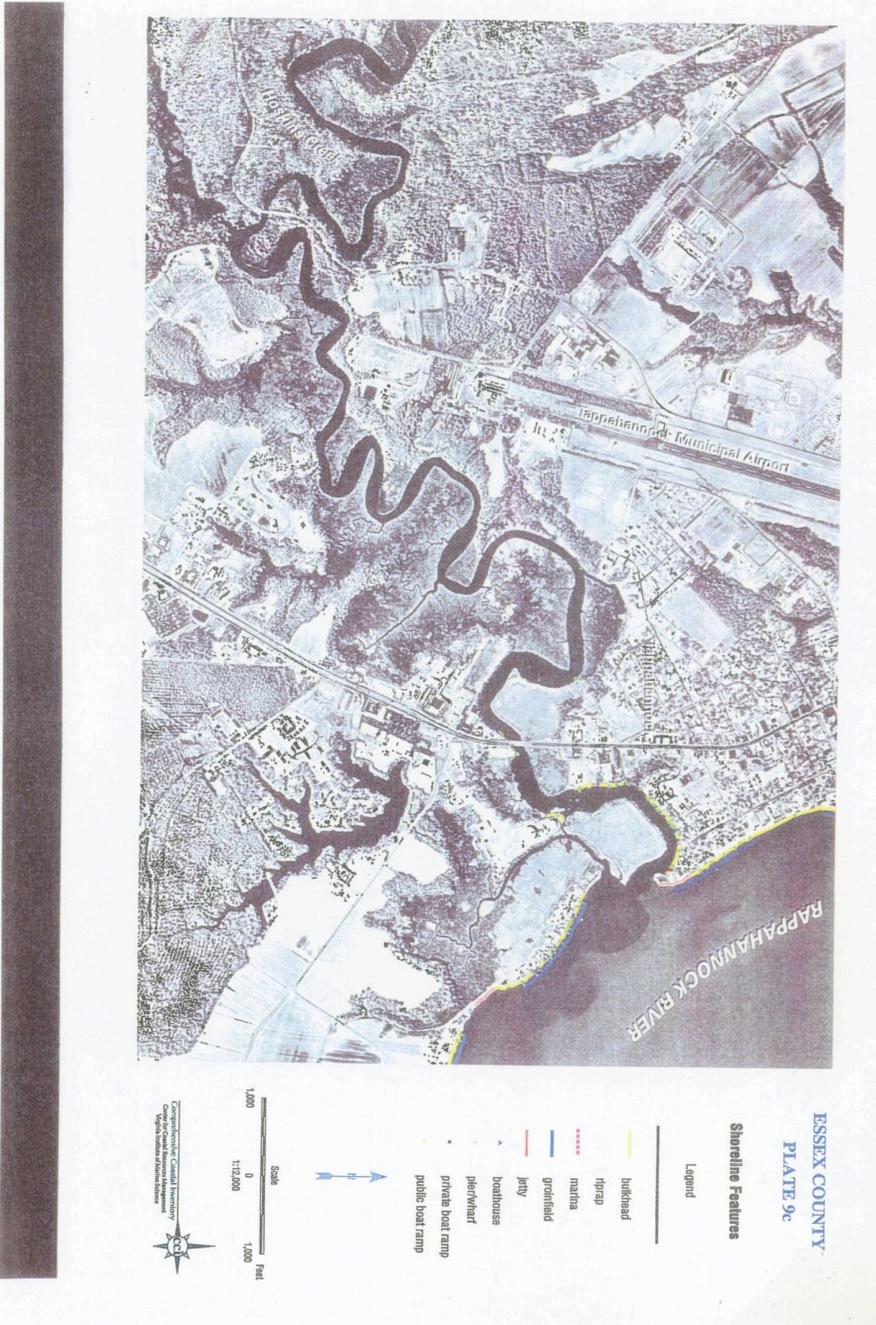
ESSEX COUNTY
PLATE 9b
Bank and Buffer Conditions

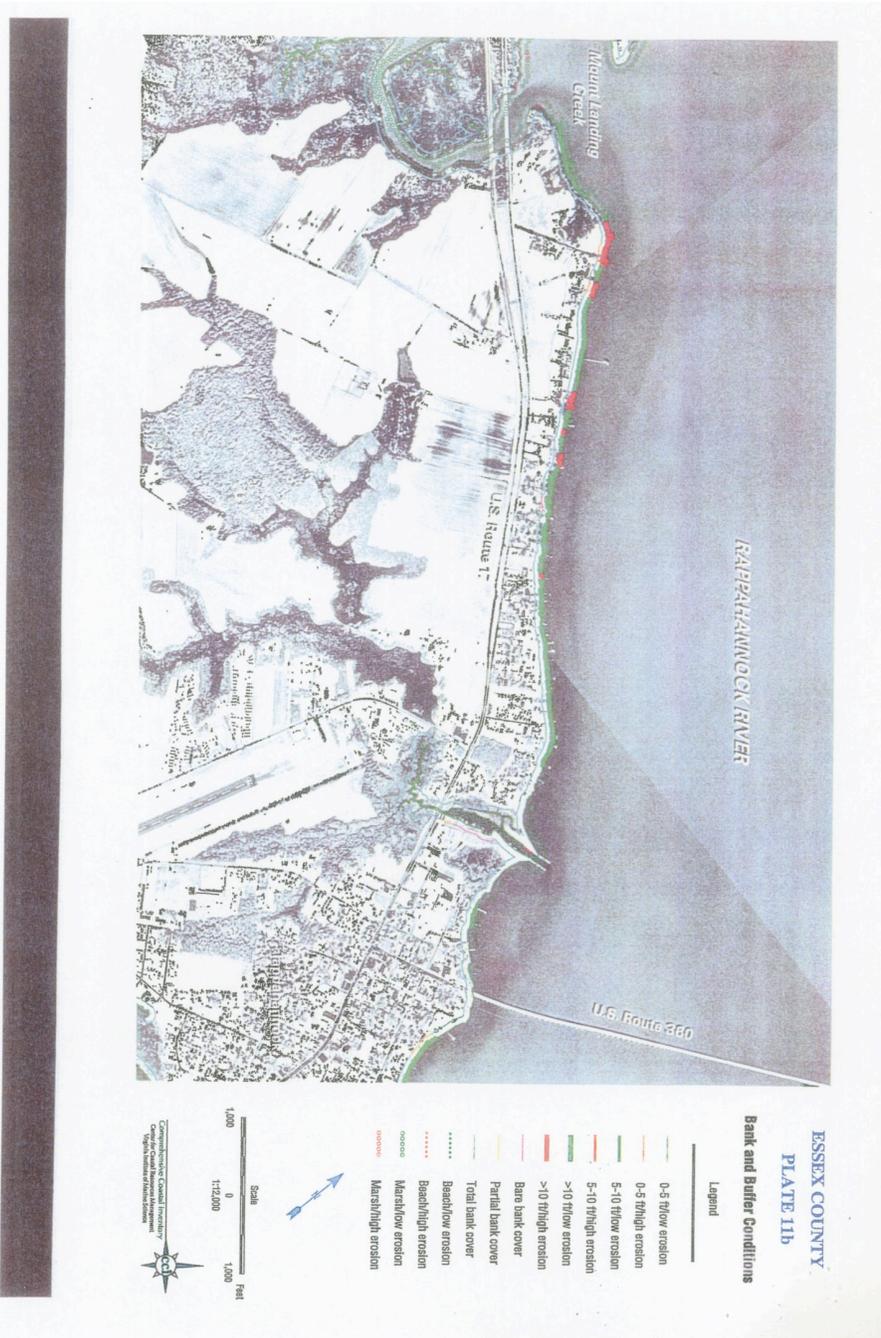
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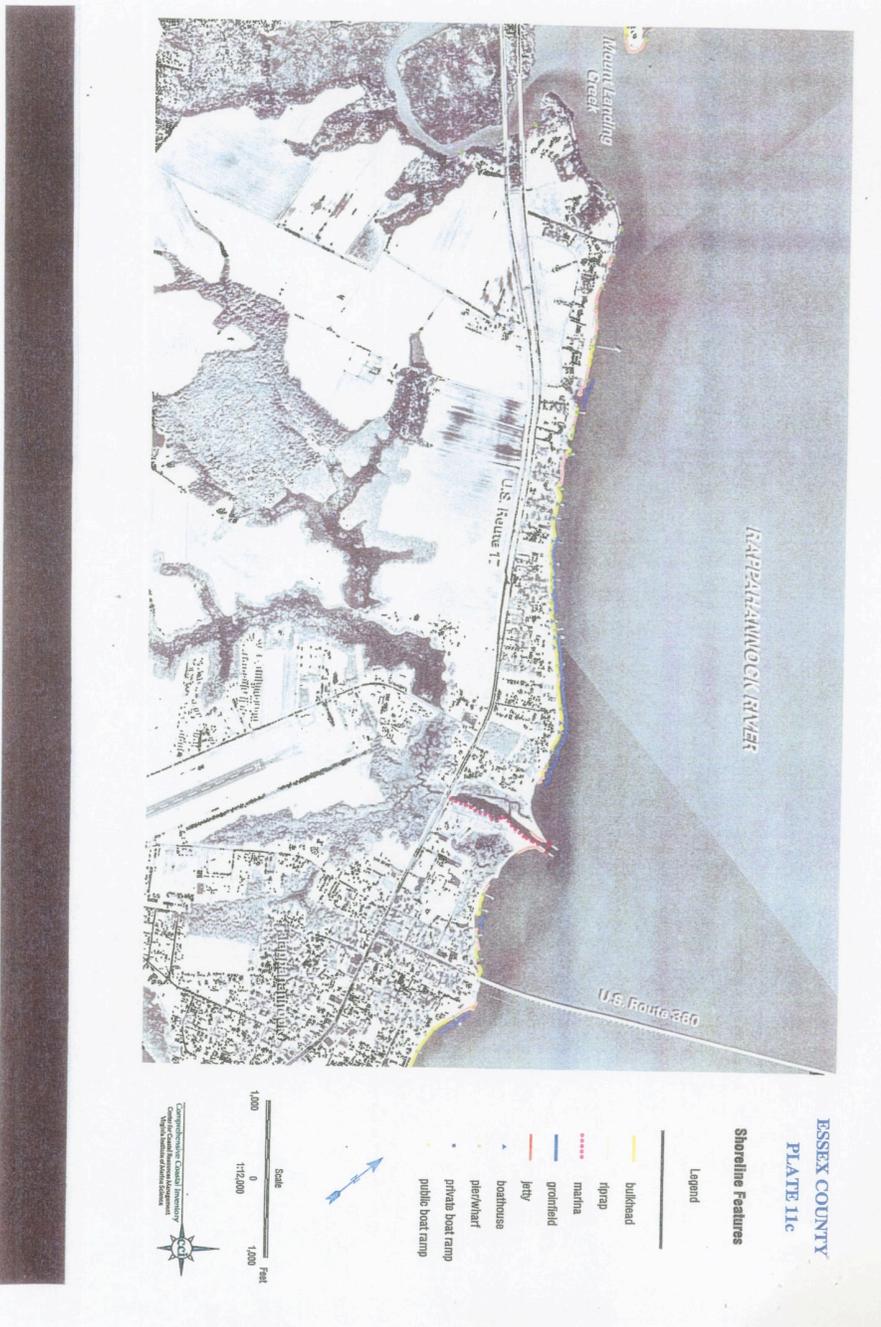
- 0-5 ft/low erosion
- 0-5 ft/high erosion
- 5-10 ft/low erosion
- 5-10 ft/high erosion
- >10 ft/low erosion
- >10 ft/high erosion
- Bare bank cover
- Partial bank cover
- Total bank cover
- Beach/low erosion
- Beach/high erosion
- Marsh/low erosion
- Marsh/high erosion



Comprehensive Land Inventory
 Open-Source Data
 © 2010 Vermont Department of Environmental Conservation







Town of Tappahannock: Shoreline Erosion and Water Quality

Appendix B

Strengths-Of General Water Resources in the Town

- Town's wastewater and water system.
- Town is Resource Management Area wide
- Good water quality/quantity water in deep wells.
- Good level of water quality monitoring.
- Active planning process.
- 1,000,000-gallon industrial user is the largest consumer of water resources within the town.

Strengths-Of the Towns Contamination and Threats to Water Resources

- Existing and expanding recycling facilities for chemicals, gas, anti-freeze, etc.

Strengths- Of the Towns Land Use Controls to protect Water Resources

- Land use plans have targeted future industrial and commercial development to area within and adjacent to the Town where municipal water treatment and water will be available.

Weaknesses- Of General Water Resources in the Town

- No land use controls in place for future high volume users.
- Very limited sewage over flows to river due to older sections of systems.

- Not all houses in Town on water and sewer system.

Weaknesses- Of the Towns Contamination and Threats to Water Resources

- Improper application of home/residential lawn fertilizer could be a problem.
- Improper disposal of home hazardous waste (motor oil, pesticides, etc.).
- Improper disposal of toxic chemicals could be a problem.

Weaknesses- Of the Towns Land Use Controls to protect Water Resources

- Little control in place for future high volume water users.

Opportunities- Of General Water Resources in the County and Town

- Population growth stable leaving time for better water planning.
- Town capacity two times present use.

Opportunities - Of the Towns Contamination and Threats to Water Resources

- New septic system technology available if few remaining on-site septic system fail.
- Education efforts to inform the general public about contamination and threats to water resources

Opportunities – In the Towns Land Use Controls to protect Water Resources

- Inventory and map locations of underground storage tanks in the County. Target these locations for monitoring and protection of nearby wells.
- Utilize citizen groups as a means of educating the public about proper disposal of home hazardous waste and toxic industrial waste.
- Utilize existing citizen groups, VPI SU Extension, in educating the public about the proper application of residential and agricultural fertilizer.

Threats- To General Water Resources in the County and Town

- No controls in place for future high volume industrial and/or agricultural users.

Threats – Of the Towns Contamination and Threats to Water Resources

- Improper disposal of many types of chemicals, hazardous waste, and other chemicals.

Threats- In the Towns Land Use Controls to protect Water Resources

- Comprehensive plans do not address educational programs about proper fertilizer application, safe disposal of hazardous household and toxic industrial waste, and the necessity of inventorying and monitoring underground storage tanks.

Strategic Groundwater Matrix Results: Strategic Plan Action Items:

Strengths /Opportunities (Use the strengths of the town to exploit the opportunities of the county related to water resources)

- Encourage Virginia’s River Country and other economic development groups to market the town’s excess water capacity and planned expansion of sewer and water to appropriate users.
- Due to the stable nature of growth of the town, explore strategic planning efforts to repair older sections of sewage lines before development exceeds the capacity of older section of the current system.

Strengths /Opportunities (Use the strengths of the town to exploit the opportunities of the county and town concerning sources of contamination and threats to water resources)

- Establish a planning committee to identify the benefits of expanding water and sewer into different communities based on water quality factors, cost, residential density and current land use activities.
- Encourage the health department, PDC and other agencies to assist Town with repair and replacement of the few remaining on-site wastewater treatment system through financial assistance and technical assistance programs.

Strengths / Threats (Use the strengths of the town to defuse / avoid the threats related to water resources)

- Provide water quality educational material to Town residents requesting to locate a new shallow well for lawn irrigation or other non-potable applications

Strengths / Threats (Use the strengths of the Town to defuse / avoid the threats to the county concerning sources of contamination and threats to water resources)

- Increase educational programs about proper fertilizer application, safe disposal of hazardous household and toxic industrial waste, and the necessity of inventorying and monitoring underground storage tanks.

Weaknesses / Opportunities (Overcome the weaknesses of the Town by taking advantage of the opportunities related to water resources)

- Due to the stable nature of growth in the Town, the town should develop a program to abandoned wells while the growth rate is static.
- Leverage existing BMP program success to develop BMPs for storm water management in town.
- Due to the stable nature of growth, explore planning efforts to repair older sections of sewage sections before development overwhelms current system.

Weaknesses / Opportunities (Over come the weaknesses of the Town by taking advantage of the opportunities concerning sources of contamination and threats to water resources)

- Encourage continued and expand use of the recycling facilities for chemicals, gas, anti-freeze, etc.

Weaknesses / Opportunities (Over come the weaknesses of the Town by taking advantage of Land Use Controls to protect water resources)

- Utilize existing citizen groups to educate public about affects of high water table and poor septic suitability on water quality. Specifically, what can local citizens do to protect groundwater from threats caused by these physical constraints?

Weaknesses / Threats (Minimize the weaknesses of the Town by avoiding threats to water resources)

- Provide educational material to new shallow well user for lawn irrigation use in an effort to protect water quality in areas where contamination is most likely.

Weaknesses / Threats (Minimize the weaknesses of the Town by avoiding threats to sources of contamination and threats to water resources)

- Undertake community level education programs to promote better understanding of high water table issues
- Develop an amnesty day for the disposal of unwanted chemicals, home hazardous waste, fertilizers etc.

Weaknesses / Threats (Minimize the weaknesses of the Town by avoiding threats to Land Use Controls to protect water resources)

- Increase educational programs about proper fertilizer application, safe disposal of hazardous household and toxic industrial waste, and the necessity of inventorying and monitoring underground storage tanks.

- Update the Town's Subdivision and Zoning Ordinances to allow open space type development, which would give developers the flexibility to cluster development on that part of the site most suitable for development, while preserving large areas for open space.

