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Shoreline Situation Report Gloucester County, Virginia

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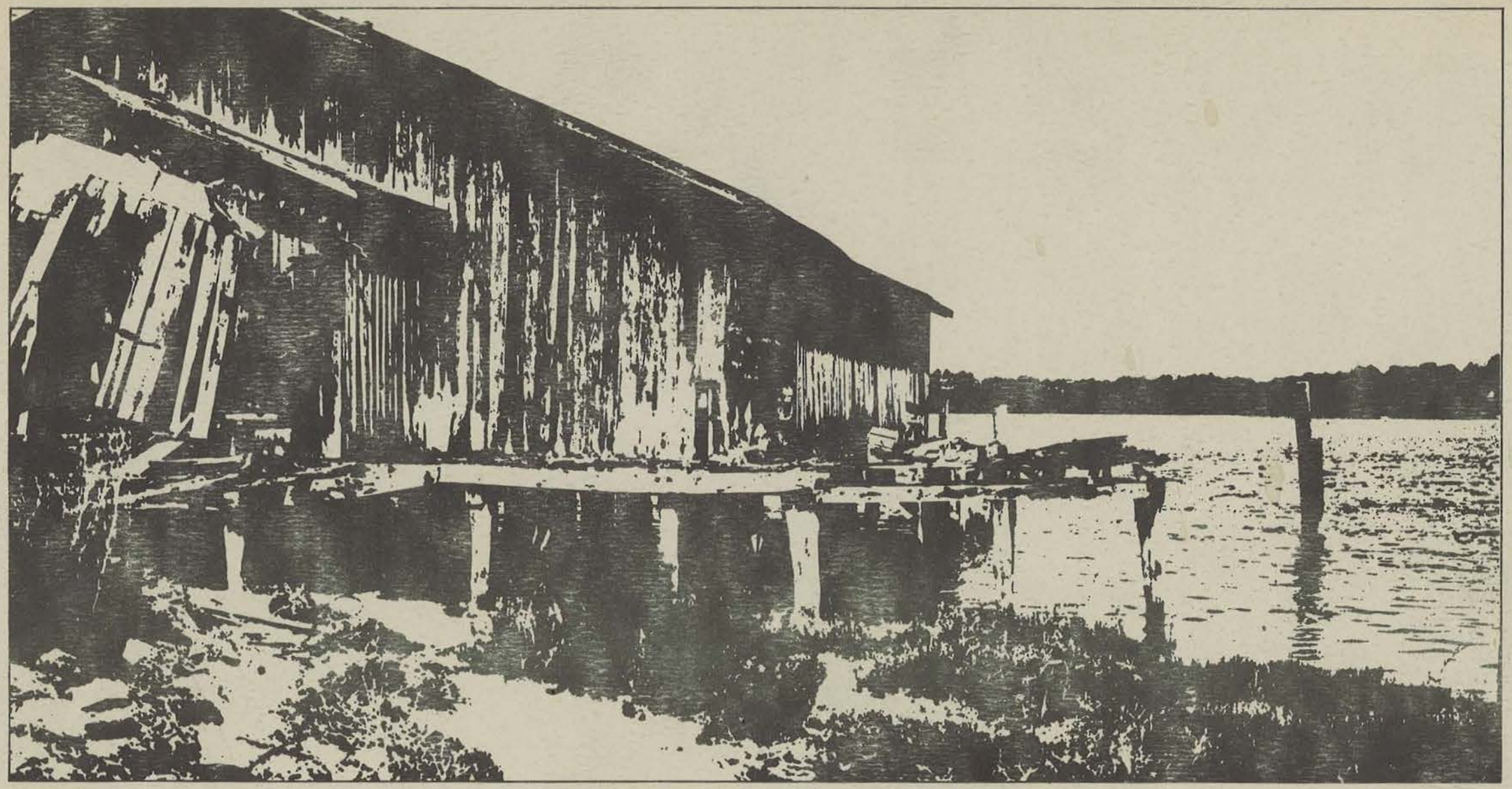

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Chesapeake Research Consortium Report Number 17

Special Report In Applied Marine Science and Ocean Engineering Number 83 of the

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Gloucester Point, Virginia 23062
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INTRODUCTION

1.1 PURPOSES AND GOALS

It is the objective of this report to supply an assessment, and at least a partial integration, of those important shoreland parameters and characteristics which will aid the planners and the managers of the shorelands in making the best decisions for the utilization of this limited and very valuable resource. The report gives particular attention to the problem of shore erosion and to recommendations concerning the alleviation of the impact of this problem. In addition we have tried to include in our assessment some of the potential uses of the shoreline, particularly with respect to recreational use, since such information could be of considerable value in the way a particular segment of coast is perceived by potential users.

The basic advocacy of the authors in the preparation of the report is that the use of shorelands should be planned rather than haphazardly developed in response to the short term pressures and interests. Careful planning could reduce the conflicts which may be expected to arise between competing interests. Shoreland utilization in many areas of the country, and indeed in some places in Virginia, has proceeded in a manner such that the very elements which attracted people to the shore have been destroyed by the lack of planning and forethought.

The major man-induced uses of the shorelands are:

-- Residential, commercial, or industrial development
-- Recreation
-- Transportation
-- Waste disposal
-- Extraction of living and non-living resources

Aside from the above uses, the shorelands serve various ecological functions.

The role of planners and managers is to optimize the utilization of the shorelands and to minimize the conflicts arising from competing demands. Furthermore, once a particular use has been decided upon for a given segment of shoreland, both the planners and the users want that selected use to operate in the most effective manner. A park planner, for example, wants the allotted space to fulfill the design most efficiently. We hope that the results of our work are useful to the planner in designing the beach by pointing out the technical feasibility of altering or enhancing the present configuration of the shore zone. Alternately, if the use were a residential development, we would hope our work would be useful in specifying the shore erosion problem and by indicating defenses likely to succeed in containing the erosion. In summary our objective is to provide a useful tool for enlightened utilization of a limited resource, the shorelands of the Commonwealth.

Shorelands planning occurs, either formally or informally, at all levels from the private owner of shoreland property to county governments, to planning districts and to the state and federal agency level. We feel our results will be useful at all these levels. Since the most basic level of comprehensive planning and zoning is at the county or city level, we have executed our report on that level although we realize some of the information may be most useful at a higher governmental level. The Commonwealth of Virginia has traditionally chosen to place, as much as possible, the regulatory decision processes at the county level. The Virginia Wetlands Act of 1972 (Chapter 2.1, Title 62.1, Code of Virginia), for example, provides for the establishment of County Boards to act on applications for alterations of wetlands. Thus, our focus at the county level is intended to interface with and to support the existing or pending county regulatory mechanisms concerning activities in the shorelands zone.

1.2 ACKNOWLEDGEMENTS

This report was prepared with funds provided by the Research Applied to National Needs Program (RANN) of the National Science Foundation through the Chesapeake Research Consortium, Inc. and with funds provided to the Commonwealth by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, Grant Number 04-5-158-50001. Beth Marshall typed the manuscript. Bill Jenkins and Ken Thornberry prepared the photographs. Dennis Owen assisted with the editing and layout. We also thank the several persons in Virginia and Maryland who have, with their suggestions and comments, assisted our work.

CHAPTER 2
Approach Used and Elements Considered

CHAPTER 2
APPROACH USED AND ELEMENTS CONSIDERED

2.1 APPROACH TO THE PROBLEM

In the preparation of this report the authors utilized existing information wherever possible. For example, for such elements as water quality characteristics, zoning regulations, or flood hazard, we reviewed relevant reports by local, state, or federal agencies. Much of the desired information, particularly with respect to erosional characteristics, shoreland types, and use was not available, so we performed the field work and developed classification schemes. In order to analyze successfully the shoreline behavior we placed heavy reliance on low altitude, oblique, color, 35 mm photography. We photographed the entire shoreline of each county and cataloged the slides for easy access at VIMS, where they remain available for use. We then analyzed these photographic materials, along with existing conventional aerial photography and topographic and hydrographic maps, for the desired elements. We conducted field inspection over much of the shoreline, particularly at those locations where office analysis left questions unresolved. In some cases we took additional photographs along with the field visits to document the effectiveness of shoreline defenses.

The basic shoreline unit considered is called a subsegment, which may range from a few hundred feet to several thousand feet in length. The end points of the subsegments were generally chosen on physiographic consideration such as changes in the character of erosion or deposition. In those cases where a radical change in land use occurred, the point of change was taken as a boundary point of the subsegment. Segments are a grouping of subsegments. The boundaries for segments also were selected on physiographic units such as necks or peninsulas between major tidal creeks. Finally, the county itself is considered as a sum of shoreline segments.

The format of presentation in the report follows a sequence from general summary statements for the county (Chapter 3) to tabular segment summaries and finally detailed descriptions and maps for each subsegment (Chapter 4). The purpose in choosing this format was to allow selective use of the report since some users' needs will adequately be met with the summary overview of the county while others will require the detailed discussion of particular subsegments.

2.2 CHARACTERISTICS OF THE SHORELANDS INCLUDED IN THE STUDY

The characteristics which are included in this report are listed below followed by a discussion of our treatment of each.

a) Shorelands physiographic classification
b) Shorelands use classification
c) Shorelands ownership classification
d) Zoning
e) Water quality
f) Shore erosion and shoreline defenses
g) Potential shore uses
h) Distribution of marshes
i) Flood hazard levels
j) Shellfish leases and public shellfish grounds
k) Beach quality

a) Shorelands Physiographic Classification:

The shorelands of the Chesapeake Bay System may be considered as being composed of three interacting physiographic elements: the fastlands, the shore and the nearshore. A graphic classification based on these three elements has been devised so that the types for each of the three elements portrayed side by side on a map may provide the opportunity to examine joint relationships among the elements. As an example, the application of the system permits the user to determine miles of high bluff shoreland interfacing with marsh in the shore zone.

Definitions:

Shore Zone

This is the zone of beaches and marshes. It is a buffer zone between the water body and the fastland. The seaward limit of the shore zone is the break in slope between the relatively steeper shoreface and the less steep nearshore zone. The approximate landward limit is a contour line representing one and a half times the mean tide range above mean low water (refer to Figure 1). In operation with topographic maps the inner fringe of the marsh symbols is taken as the landward limit.

The physiographic character of the marshes has also been separated into three types (see Figure 2). Fringe marsh is that which is less than 400 feet in width and which runs in a band parallel to the shore. Extensive marsh is that which has extensive acreage projecting into an estuary or river. An embayed marsh is a marsh which occupies a reentrant or drowned creek valley. The purpose in delineating these marsh types is that the effectiveness of the various functions of the marsh will, in part, be determined by type of exposure to the estuarine system. A fringe marsh may, for

example, have maximum value as a buffer to wave erosion of the fastland. An extensive marsh, on the other hand, is likely a more efficient transporter of detritus and other food chain materials due to its greater drainage density than an embayed marsh. The central point is that planners, in the light of ongoing and future research, will desire to weight various functions of marshes and the physiographic delineation aids their decision making by denoting where the various types exist. The classification used is:

Beach

Marsh

- Fringe marsh, < 400 ft. (122 m) in width along shores
- Extensive marsh
- Embayed marsh, occupying a drowned valley or reentrant

Artificially stabilized

Fastland Zone

The zone extending from the landward limit of the shore zone is termed the fastland. The fastland is relatively stable and is the site of most material development or construction. The physiographic classification of the fastland is based upon the average slope of the land within 400 feet (122 m) of the fastland - shore boundary. The general classification is:

- Low shore, 20 ft. (6 m) or less of relief; with or without cliff
- Moderately low shore, 20-40 ft. (6-12 m) of relief; with or without cliff
- Moderately high shore, 40-60 ft. (12-18 m) of relief; with or without cliff
- High shore, 60 ft. (18 m) or more of relief; with or without cliff.

Two specially classified exceptions are sand dunes and areas of artificial fill.

Nearshore Zone

The nearshore zone extends from the shore zone to the 12-foot (MLW datum) contour. In the smaller tidal rivers the 6-foot depth is taken as the reference depth. The 12-foot depth is probably the maximum depth of significant sand transport by waves in the Chesapeake Bay area. Also, the distinct drop-off into the river channels begins roughly at the 12-foot depth. The nearshore zone includes any tidal flats.

The class limits for the nearshore zone classifications were chosen following a simple statistical study. The distance to the 12-foot underwater contour (isobath) was measured on the appropriate charts at one-mile intervals along the shorelines of Chesapeake Bay and the James, York, Rappahannock, and Potomac Rivers. Means and standard deviations for each of the separate regions and for the entire combined system were calculated and compared. Although the distributions were non-normal, they were generally comparable, allowing the data for the entire combined system to determine the class limits.

The calculated mean was 919 yards with a standard deviation of 1,003 yards. As our aim was to determine general, serviceable class limits, these calculated numbers were rounded to 900 and 1,000 yards respectively. The class limits were set at half the standard deviation (500 yards) each side of the mean. Using this procedure a narrow nearshore zone is one 0-400 yards in width, intermediate 400-1,400, and wide greater than 1,400.

The following definitions have no legal significance and were constructed for our classification purposes:

Narrow, 12-ft. (3.7 m) isobath located < 400 yards from shore

Intermediate, 12-ft. (3.7 m) isobath 400-1,400 yards from shore

Wide, 12-ft. (3.7 m) isobath > 1,400 yards

Subclasses: with or without bars
with or without tidal flats
with or without submerged vegetation

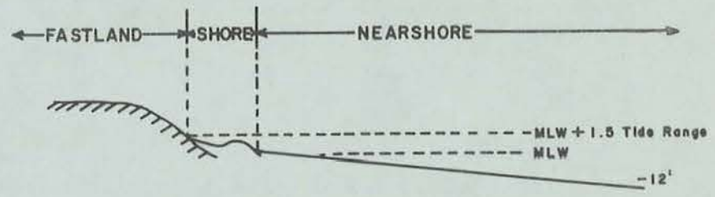


Figure 1

An illustration of the definition of the three components of the shorelands.

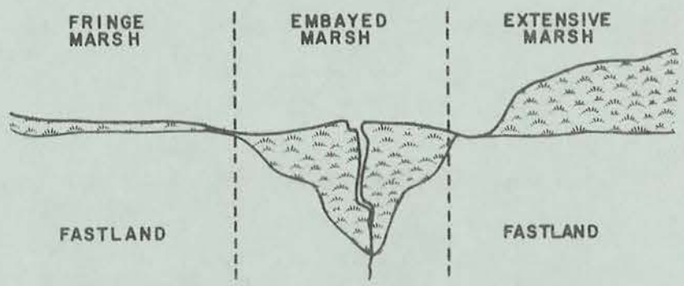


Figure 2

A generalized illustration of the three different marsh types.

b) Shorelands Use Classification:

Fastland Zone

Residential

Includes all forms of residential use with the exception of farms and other isolated dwellings. In general, a residential area consists of four or more residential buildings adjacent to one another. Schools, churches, and isolated businesses may be included in a residential area.

Commercial

Includes buildings, parking areas, and other land directly related to retail and wholesale trade and business. This category includes small industry and other anomalous areas within the general commercial context. Marinas are considered commercial shore use.

Industrial

Includes all industrial and associated areas. Examples: warehouses, refineries, shipyards, power plants, railyards.

Government

Includes lands whose usage is specifically controlled, restricted, or regulated by governmental organizations: e.g., Camp Peary, Fort Story.

Recreation and Other Public Open Spaces

Includes designated outdoor recreation lands and miscellaneous open spaces. Examples: golf courses, tennis clubs, amusement parks, public beaches, race tracks, cemeteries, parks.

Preserved

Includes lands preserved or regulated for environmental reasons, such as wildlife or wildfowl sanctuaries, fish and shellfish conservation grounds, or other uses that would preclude development.

Agricultural

Includes fields, pastures, croplands, and other agricultural areas.

Unmanaged

Includes all open or wooded lands not included in other classifications:

a) Open: brush land, dune areas, wastelands; less than 40% tree cover.

b) Wooded: more than 40% tree cover.

The shoreland use classification applies to the general usage of the fastland area to an arbitrary distance of half mile from the shore or beach zone or to some less distant, logical barrier. In multi-usage areas one must make a subjective selection as to the primary or controlling type of usage.

Shore Zone

Bathing
Boat launching
Bird watching
Waterfowl hunting

Nearshore Zone

Pound net fishing
Shellfishing
Sport fishing
Extraction of non-living resources
Boating
Water sports

c) Shorelands Ownership Classification:

The shorelands ownership classification used has two main subdivisions, private and governmental, with the governmental further divided into federal, state, county, and town or city. Application of the classification is restricted to fastlands alone since the Virginia fastlands ownership extends to mean low water. All bottoms below mean low water are in State ownership.

d) Water Quality:

The ratings of satisfactory, intermediate or unsatisfactory assigned to the various sugsegments are taken from a listing at the Virginia Bureau of Shellfish Sanitation, based on information from water samples collected in the various tidewater shellfishing areas. The Bureau attempts to visit each area at least once a month.

The ratings are defined primarily in regard to number of coliform bacteria. For a rating of satisfactory the maximum limit is an MPN (Most Probable Number) of 70 per 100 ml. The upper limit for fecal coliforms is an MPN of 23. Usually any count above these limits results in an unsatisfactory rating, and, from the Bureau's standpoint, results in restricting the waters from the taking of shellfish for direct sale to the consumer.

There are instances, however, when the total coliform MPN may exceed 70, although the fecal MPN does not exceed 23, and other conditions are acceptable. In these cases an intermediate rating may be assigned temporarily, and the area will be permitted to remain open pending an improvement in conditions.

Although these limits are somewhat more stringent than those used in rating recreational waters

(see Virginia State Water Control Board, Water Quality Standards 1946, amended 1970), they are used here because the Bureau of Shellfish Sanitation provides the best areawide coverage available at this time. In general, any waters fitting the satisfactory or intermediate categories would be acceptable for water recreation.

e) Zoning:

In cases where zoning regulations have been established the existing information pertaining to the shorelands has been included in the report.

f) Shore Erosion and Shoreline Defenses:

The following ratings are used for shore erosion:

slight or none - less than 1 foot per year
moderate - - - - 1 to 3 feet per year
severe - - - - - greater than 3 feet per year

The locations with moderate and severe ratings are further specified as being critical or noncritical. The erosion is considered critical if buildings, roads, or other such structures are endangered.

The degree of erosion was determined by several means. In most locations the long term trend was determined using map comparisons of shoreline positions between the 1850's and the 1940's. In addition, aerial photographs of the late 1930's and recent years were utilized for an assessment of more recent conditions. Finally, in those areas experiencing severe erosion field inspections and interviews were held with local inhabitants.

The existing shoreline defenses were evaluated as to their effectiveness. In some cases repetitive visits were made to monitor the effectiveness of recent installations. In instances where existing structures are inadequate, we have given recommendations for alternate approaches. Furthermore, recommendations are given for defenses in those areas where none currently exist. The primary emphasis is placed on expected effectiveness with secondary consideration to cost.

g) Potential Shore Uses:

We placed particular attention in our study on evaluating the recreational potential of the shore zone. We included this factor in the consideration of shoreline defenses for areas of high recreational potential. Furthermore, we gave consideration to the development of artificial beaches if this method were technically feasible at a particular site.

h) Distribution of Marshes:

The acreage and physiographic type of the marshes in each subsegment are listed. These estimates of acreages were obtained from topographic maps and should be considered only as approximations. Detailed county inventories of the wetlands are being conducted by the Virginia Institute of Marine Science under the authorization of the Virginia Wetlands Act of 1972 (Code of Virginia 62.1-13.4). These surveys include detailed acreages of the grass species composition within individual marsh systems. The material in this report is provided to indicate the physiographic types of marshes and to serve as a rough guide on acreages until detailed surveys are completed. Additional information of the wetlands characteristics may be found in Coastal Wetlands of Virginia: Interim Report by Marvin L. Wass and Thomas D. Wright, SRAMSOE Report No. 10, Virginia Institute of Marine Science, 1969, and in other VIMS publications.

i) Flood Hazard Levels:

The assessment of tidal flooding hazard for the whole of the Virginia tidal shoreland is still incomplete. However, the United States Army Corps of Engineers has prepared reports for a number of localities which were used in this report. Two tidal flood levels are customarily used to portray the hazard. The Intermediate Regional Flood is that flood with an average recurrence time of about 100 years. An analysis of past tidal floods indicates it to have an elevation of approximately 8 feet above mean water level in the Chesapeake Bay area. The Standard Project Flood level is established for land planning purposes which is placed at the highest possible flood level.

j) Shellfish Leases and Public Grounds:

The data in this report show the leased and public shellfish grounds as portrayed in the Virginia State Water Control Board publication "Shellfish growing areas in the Commonwealth of Virginia: Public, leased and condemned," November 1971, and as periodically updated in other similar reports. Since the condemnation areas change with time they are not to be taken as definitive. However, some insight to the conditions at the date of the report are available by a comparison between the shellfish grounds maps and the water quality maps for which water quality standards for shellfish were used.

k) Beach Quality:

Beach quality is a subjective judgment based on such considerations as the nature of the beach material, the length and width of the beach area, and the general aesthetic appeal of the beach setting.

CHAPTER 3
Present Shorelands Situation

CHAPTER 3
PRESENT SHORELANDS SITUATION OF GLOUCESTER COUNTY, VIRGINIA

3.1 THE SHORELANDS OF GLOUCESTER COUNTY

Gloucester County, comprising 257.0 square miles, is the southernmost of the three Chesapeake Bay fronting counties of the "middle peninsula". Its York River, Piankatank River, and Chesapeake Bay shorelands are incised by numerous tidal rivers and creeks. Altogether, there are 296.4 miles of shoreline in the county. The major portion of the shore zone, 87%, is comprised of wetlands including fringe, embayed, and extensive marsh. The only segments of the shore not considered low shore are those along the York River from the Poropotank River to Sarah Creek (Segments 1A through 3A). Along this area much of the fastland is classified as moderately low shore with bluffs ranging in height from 20 to 40 feet. The rest of the shore zone is composed of beaches. Most of the beaches occur in the form of narrow, fringe beaches. There are only three beaches that have the potential for medium to high density recreational purposes. These are found, just southeast of Fox Creek, around Gloucester Point, and on lower Jenkins Neck, around Sandy Point.

The fastland zone consists primarily of unmanaged, wooded lands. Thirty-five percent is used as agricultural fields. The remaining shorelands consist of residential use (18%), commercial use (12%), and recreational use (1%).

The predominant shorelands use is for singular or multiple unit residential developments. These occur throughout the county. The Gloucester Point area and particularly the shore of Sarah Creek have a high incidence of this type of development. Other uses include seven public marinas, three full time boat yards, numerous seafood processing plants, and twenty-nine public landings and access sites. The marinas and boat yards provide a base for the extensive commercial and recreational fishing activities which occur along the county's nearshore and offshore areas.

Little direct use is made of the wetlands except for extensive waterfowl hunting. This type of use is acceptable as long as the marshes are not damaged. They should be preserved due to their ecological assets and their flood and erosion protection qualities.

The beaches in the county are used primarily for private recreation. One 200-foot section of beach at Gloucester Point has been designated for public use. This is the only public beach in Gloucester County.

The nearshore and offshore zones receive intensive use by water sport enthusiasts, commercial and sport fishermen, and heavy commercial and naval ship traffic.

3.2 SHORELINE EROSION IN GLOUCESTER COUNTY

The magnitude of shore erosion in Gloucester County varies from slight or no change to severe. Historically, Gloucester County has lost 1,153 acres of land from its shoreline in the last one hundred years. This indicates a loss of four acres per mile of shoreline in the last century. This loss has been almost equally divided between the Chesapeake Bay fronting shoreline and the York River shoreline. During different but equal time spans, the York River lost 442 acres while the Bay shore lost 437 acres. However, a review of the rates of erosion reveals a difference in the range of erosion rate for the two areas. The highest rate, 4.4 feet per year, was recorded along a portion of the Bay shore while the maximum along the York shore was 1.9 feet per year. Several reasons account for this disparity in rates yet similarity in areal losses. At this point we will discuss the processes in shore erosion.

3.21 Processes of Shore Erosion

Waves generated by local winds are the dominant agent of erosion in the Chesapeake Bay system. The growth and height of waves is controlled by four factors: the over water distance across which the wind blows, known as the fetch; the velocity of the wind; the duration of the wind; and the depth of the water.

Due to the weather patterns affecting the Chesapeake Bay area, maximum winds occur during storms and frontal passages. The winds of northeast storms during the fall, winter, and spring generate waves which attack the western shore of the Bay. The winds and low barometric pressure near the Bay mouth have an indirect effect on erosion by forcing additional water into the Bay. This storm surge or "wind tide" may be two or more feet above the normal tide level. For example, the severe northeast storm of March, 1962 caused water elevations in Norfolk Harbor, Virginia, to reach an elevation approximately six feet above usual spring high tide levels. When similar high water levels occur, the wave driven erosional action is concentrated higher on the fastland, above the natural buffer zone or beach.

In addition to the height of the waves, the

direction at which they impinge upon the shore controls the magnitude of long shore transport. In theory, the transport of material along the beach is greatest when the waves break on the shoreline at an angle of forty-five degrees.

The erosional behavior of any particular segment of shoreline may be expected to vary from year to year depending upon the frequency and the intensity of storms. Also, similar variances may arise from differences in mean sea level elevations. The long term (decades) trend is for a relative rise in sea level. In the lower Chesapeake Bay the trend is about 0.01 feet per year. Yearly variations of 0.15 feet per year are not uncommon. Although these differences are small, they can be significant when translated to horizontal distances across a gently sloping shore.

The role played by beaches in the physical processes of the coastline merits reiteration: beaches are natural land forms which serve to absorb incident wave energy thereby inhibiting erosion of the fastland. The configuration of any beach may change hour by hour or day by day as the accumulation of sand adjusts to changing conditions. By and large, the natural maintenance of Virginia's Chesapeake Bay beaches is attained at the expense of erosion of the fastland. For any particular segment of shoreline, the beach sand is derived from erosion of the fastland, either at that site or from an up-drift site. A problem along the Bay shore in Gloucester County is the very low topography and resulting small sediment supply from the fastlands.

3.22 The Chesapeake Bay Shore

The extremely irregular shape of the Bay portion of Gloucester's shoreline has influenced the pattern of erosion. Those areas which directly border on the Chesapeake Bay or Mobjack Bay have undergone the most severe erosion. In general, Hog Island to Rock Point, Turtle Neck Point to Windmill Point, and portions of Ware Neck are the areas which have experienced the most severe erosion. Rates of retreat in these sections center around two feet per year with a maximum rate of 4.4 feet per year near John West Creek. The exposure of these areas makes them extremely susceptible to erosion. The limited supply of sand has prevented adequate buffering beaches from forming. This is particularly true between Windmill Point and Four Point Marsh. The beach there is extremely thin and narrow, due to the limited supply of sand available from the eroding fastland.

In general, the rates of retreat for this section are higher than the York River portion. However, they are restricted to smaller areas thereby accounting for the similarity in acreage lost.

3.23 The York River Shore

The York River shoreline above Gloucester Point is basically oriented northwest - southeast. Its shorelands are basically extensive marsh or low cliffs with either fringe marsh or narrow beaches at the toe. The limited fetches allow only storms from the northwest through the southeast to directly attack the shoreline during conditions of elevated water levels. Although the marshes and beaches of this section have undergone erosion, the rates are generally less than one foot per year with the maximum being 1.5 feet per year.

The orientation of the area from Gloucester Point to the Guinea Marshes is basically east to west. Its shoreline is also characterized by extensive marshes or low cliffs fronted by fringe marsh or beach. The York River portion generally has an average rate of retreat of one foot per year with a maximum rate of 1.9 feet per year. A rate of retreat was not assigned to the Guinea Marsh Islands due to their extremely irregular pattern of shoreline retreat. However, seventy-three percent of the areal loss for this section was in these marshland areas.

3.24 The Piankatank River Shore

Gloucester County also borders on a portion of the Piankatank River. Although fetches are limited, moderate erosion has occurred along this portion. Erosion along this section is primarily the result of waves undercutting the cliffs during abnormally high water. The resultant slumping carries trees with it, which in turn, pull additional material with them as they fall. In addition, rain runoff over the face of these cliffs carries away large amounts of the cliff material. The percentage of sand in this eroded cliff material is small which results in narrow, thin beaches. These small beaches do not provide the protection necessary to hinder erosion during times of abnormally high water.

3.3 POTENTIAL SHORELANDS USE

One of the dominating influences on the growth of Gloucester County has been the George P. Coleman Bridge. Its existance has allowed ready access by Gloucester and other middle peninsula

residents to the job market of the lower peninsula. In turn it has allowed residents of the lower peninsula the ability to move to Gloucester and still commute to work. The shorelands of Gloucester County have received the brunt of this influx. Waterfront property is at a premium. This pressure which has led to medium density development along portions of Gloucester's shoreline, can be expected to increase, particularly in light of the removal of the toll from the George P. Coleman Bridge.

Attendant with the population increase has been an increase in the use of the shorelands for both private recreation and commercial purposes. The increased shore use has led to an awareness of the problems of erosion. Erosion is a natural phenomenon, however in many cases, the rate at which it occurs is accelerated by man's actions. This stems not only from improper use of erosion control structures (Figure 3) but also unwise development practices. There are no patent answers in erosion control. In many areas the removal of ground cover leads to an increase in the erosion rate by increasing the rain runoff over the cliff face. What is needed is professional advice and in most cases a plan which suits the needs of a particular section of shoreline.

Erosion is but one of several problems which face the users of Gloucester County's shoreline. An ever increasing problem is the deterioration of the water quality. Increasing residential and commercial development and the lack of adequate sewage treatment facilities have led to several closures of shellfish grounds (Figure 4, Map 1E). Related actions such as over-fertilization of lawns and over use of pesticides also contribute to the degradation of the water quality. Localized reduction in water quality is typified by actions such as those illustrated in Figure 5. This type of dredging creates an unproductive bottom due to the lack of circulation within the lower sections of the canal.

Flooding of the low lying areas is also a very real hazard along most of Gloucester's shoreline. Aside from the physical damage to structures, it leads to the introduction of chemical and sewage wastes into the nearshore waters.

An acute problem which faces all residents, present and future, is the lack of adequate public shorelands recreational facilities. The Gloucester Point area now encompasses the sum total of such facilities. Although the area is small, it has the potential of being expanded. Parking can be expanded to the earthworks near the bridge. Past road building activities in this area have created a stagnant pond. In the light of direct public benefit, it could be filled to expand the parking facilities.

Although the persistent jellyfish problem makes summer long swimming less than desirable, the picnic potential is still high. One or two picnic shelters could be constructed. The recent rejuvenation of the fishing pier has increased the public use of the area. Expansion of the "T" end of the pier would more adequately meet this demand.

Swimming should be restricted to areas away from the wharf at the end of the point. This point area has extremely strong tidal currents and the bottom drops off dramatically very close to the shore. The swimming area should be designated by ropes and signs which would act to deter infringement by boaters as well.

This discussion is aimed at increasing the awareness of potential shorelands residents and users of some of the problems they now face and will continue to face. To insure clean water, adequate beaches, and public access, certain steps need to be taken, these steps are:

1. development of shore oriented public recreational facilities,
2. exploration of alternate sewage treatment systems for the low lying residential areas,
3. acquisition of professional advice concerning wetlands and erosion, and
4. development of a coastal management plan which would insure for future generations the maximum use of shorelands with minimum environmental impact.

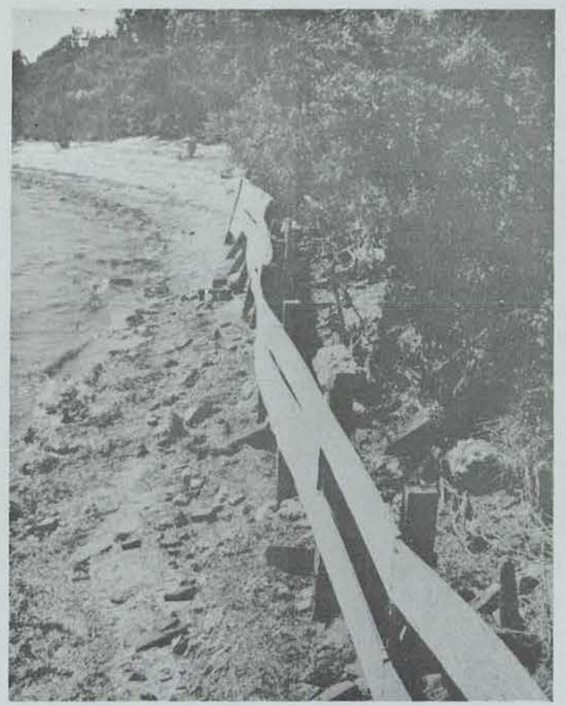


FIGURE 3

FIGURE 4

FIGURE 3: Bulkhead on Jenkins Neck. This type of construction is not substantial enough to resist wave forces and can accelerate the local erosion rate.

FIGURE 4: Commercial and residential pollutants have closed Sarah Creek to shellfishing. Planning should be instituted to prevent the degradation of water quality in this and other creeks.

FIGURE 5: Dredged dead end canals like these on the Severn River are generally discouraged. The canals have not caused an increase in boat use because extensive flats are located between them and the river channel. Dead end canals can also produce biological deserts on their bottoms. This is a result of lack of circulation in the lower water layers.

FIGURE 6: Intensive developments such as this can lead to a degradation of the water quality. Septic fields are only marginally effective and are easily flooded. The flood hazard is high for most of Gloucester's shoreline.

FIGURE 5

FIGURE 6

FIGURE 7: The Fox Creek area has the potential of being a good shore oriented public recreational facility. An area such as this could be developed publicly or privately to meet the county's growing recreational demand.

FIGURE 8: Groins have been much overused and misused. Less expensive and more effective alternatives are being developed which have application to certain portions of Gloucester's eroding shore.

FIGURE 7

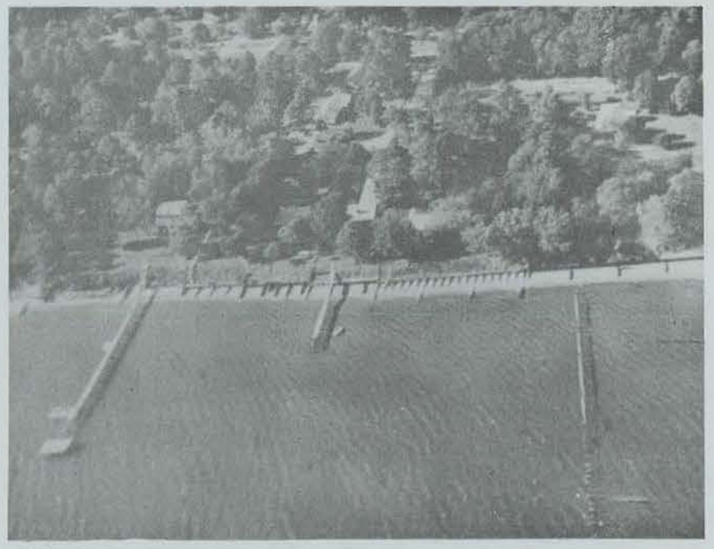


FIGURE 8

FIGURE 9

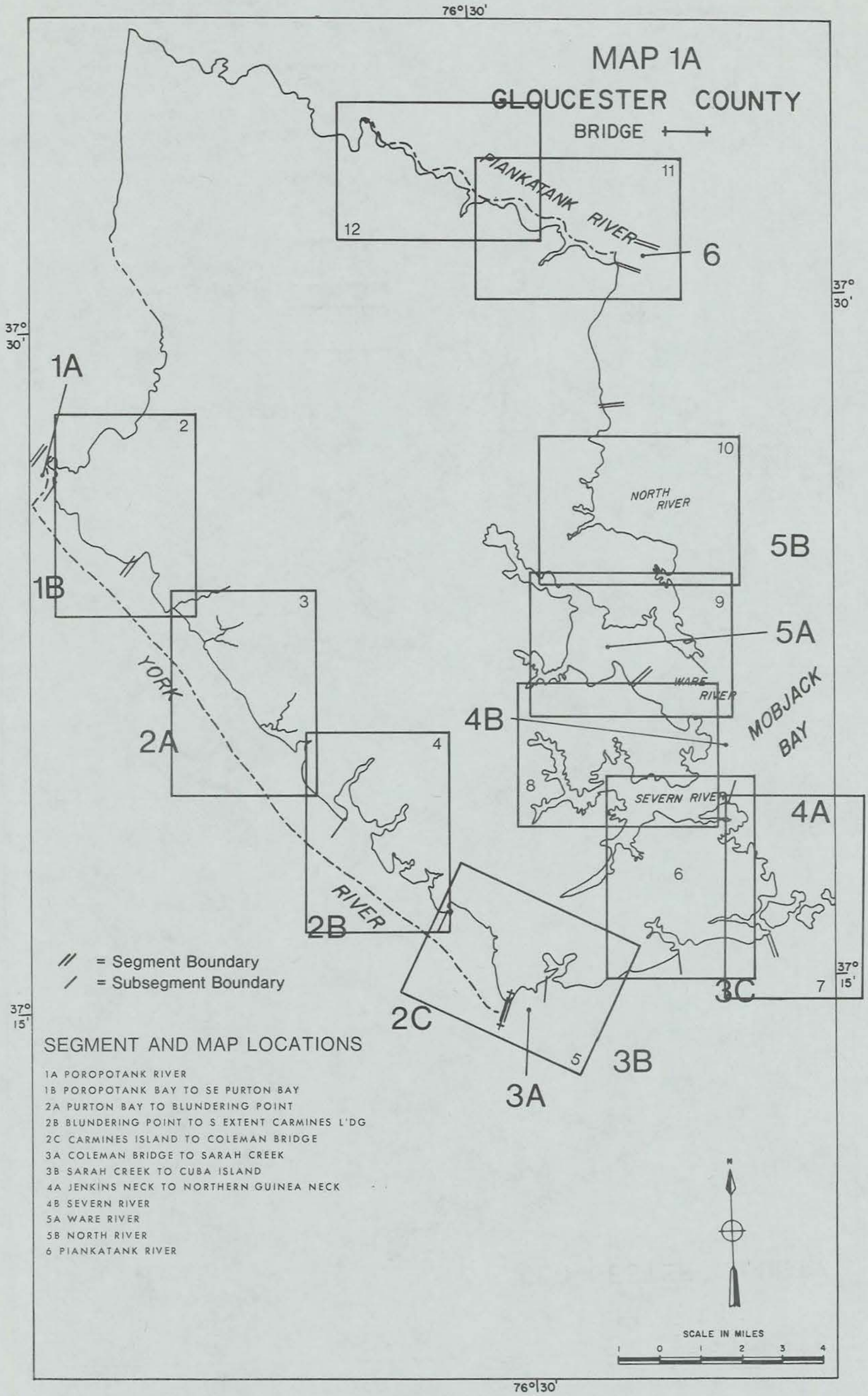
FIGURE 10

FIGURE 9: When used properly, riprap revetments can be very effective at slowing erosion. Proper application includes the use of filter cloth and adequate size stone. The stones should be placed rather than dumped on the shoreline.

FIGURE 10: Vertical retaining structures also need careful consideration in design and emplacement. In most areas, waves reflected off the wall during storm elevated water levels scour out any protective beach that once fronted the wall. If the walls lack adequate penetration, undercutting can collapse the structure during severe storms.

TABLE 1. SUMMARY OF GLOUCESTER COUNTY, VIRGINIA SHORELANDS PHYSIOGRAPHY, FASTLAND USE, OWNERSHIP (STATUTE MILES)

Physiographic, use and ownership classification / Subsegment	SHORELANDS PHYSIOGRAPHY													FASTLANDS USE						OWNERSHIP		TOTAL MILES
	FASTLAND				SHORE					NEARSHORE												
	LOW SHORE	LOW SHORE WITH BLUFF	MODERATELY LOW SHORE	MODERATELY LOW SHORE WITH BLUFF	BEACH	FRINGE MARSH	EMBAYED MARSH	EXTENSIVE MARSH	ARTIFICIALLY STABILIZED	NARROW	INTERMEDIATE	WIDE	AGRICULTURAL	COMMERCIAL	GOVERNMENTAL	RECREATIONAL	RESIDENTIAL	UNMANAGED, WOODED	PRIVATE	STATE	
1A	3.8		3.9				7.7			7.7			0.4					7.3	7.7		7.7
1B	6.3							6.3		4.0	2.3							6.3	6.3		6.3
2A			25.0	4.0	4.5	2.6	20.2		1.7		9.3		13.5				2.9	12.6	29.0		29.0
2B	14.2		17.4			12.9	4.5	14.2			3.8		5.6				3.8	22.2	31.6		31.6
2C	1.1		3.7		3.2	0.8			0.8	0.6	1.4	2.8			0.4		4.4		4.4	0.4	4.8
3A	0.5			1.0	0.4				1.1	0.3	1.2			0.1	0.2		1.2		1.3	0.2	1.5
3B	21.9				2.9	14.3			4.7			3.7		0.9			16.6	4.4	21.9		21.9
3C	12.1				9.2	0.5	1.2		1.2		2.4		4.7				5.1	2.3	12.1		12.1
4A	26.8				0.2			26.6			1.5	25.3	12.1				4.0	10.7	26.8		26.8
4B	64.8				5.9	51.2	4.9	2.0	0.8	10.1	5.6		25.9	1.9		1.4	9.7	25.9	64.8		64.8
5A	32.7					28.8	2.5		1.4	3.4	4.5		13.1				3.3	16.3	32.7		32.7
5B	28.4					25.1	2.1		1.2	1.1	4.9		14.2				0.9	13.3	28.4		28.4
6	24.1	0.6		4.1	1.1	24.1	3.4		0.2	2.4			13.5			0.6	2.9	11.8	28.8		28.8
SUBTOTAL	236.7	0.6	50.0	9.1	27.4	160.3	46.5	49.1	13.1	29.6	36.9	31.8	103.0	2.9	0.6	2.0	54.8	133.1	295.8	0.6	296.4
% of SHORELINE	80%	0	17%	3%	9%	54%	16%	17%	4%	10%	12%	11%	35%	1%	0	1%	18%	45%	100%	0	100%


76°|30'
MAP 1A
GLOUCESTER COUNTY
BRIDGE
PIANKATANK RIVER
11
12
6
37°
30'
1A
2
10
NORTH
RIVER
5B
1B
3
9
5A
YORK
WARE
RIVER
4B
MOBJACK
BAY
2A
4
8
SEVERN RIVER
4A
6
RIVER
2B
// = Segment Boundary
/ = Subsegment Boundary
37°
15'
7
3C
2C
5
3B
3A
SEGMENT AND MAP LOCATIONS
1A POROPOTANK RIVER
1B POROPOTANK BAY TO SE PURTON BAY
2A PURTON BAY TO BLUNDERING POINT
2B BLUNDERING POINT TO S EXTENT CARMINES L'DG
2C CARMINES ISLAND TO COLEMAN BRIDGE
3A COLEMAN BRIDGE TO SARAH CREEK
3B SARAH CREEK TO CUBA ISLAND
4A JENKINS NECK TO NORTHERN GUINEA NECK
4B SEVERN RIVER
5A WARE RIVER
5B NORTH RIVER
6 PIANKATANK RIVER
N
SCALE IN MILES
1 0 1 2 3 4
76°|30'

MAP 1B
GLOUCESTER COUNTY

76°|30'

37°|30'

BRIDGE

PIANKATANK RIVER

6

1A

1B

YORK

2A

2B

RIVER

NORTH RIVER

5B

5A

WARE RIVER

MOBJACK BAY

4B

SEVERN RIVER

4A

3C

3B

3A

2C

37°|15'

SHORELANDS TYPES

FASTLAND
- Low Shore
- Low Shore with Bluff
- Moderately Low Shore
- Moderately Low Shore with Bluff

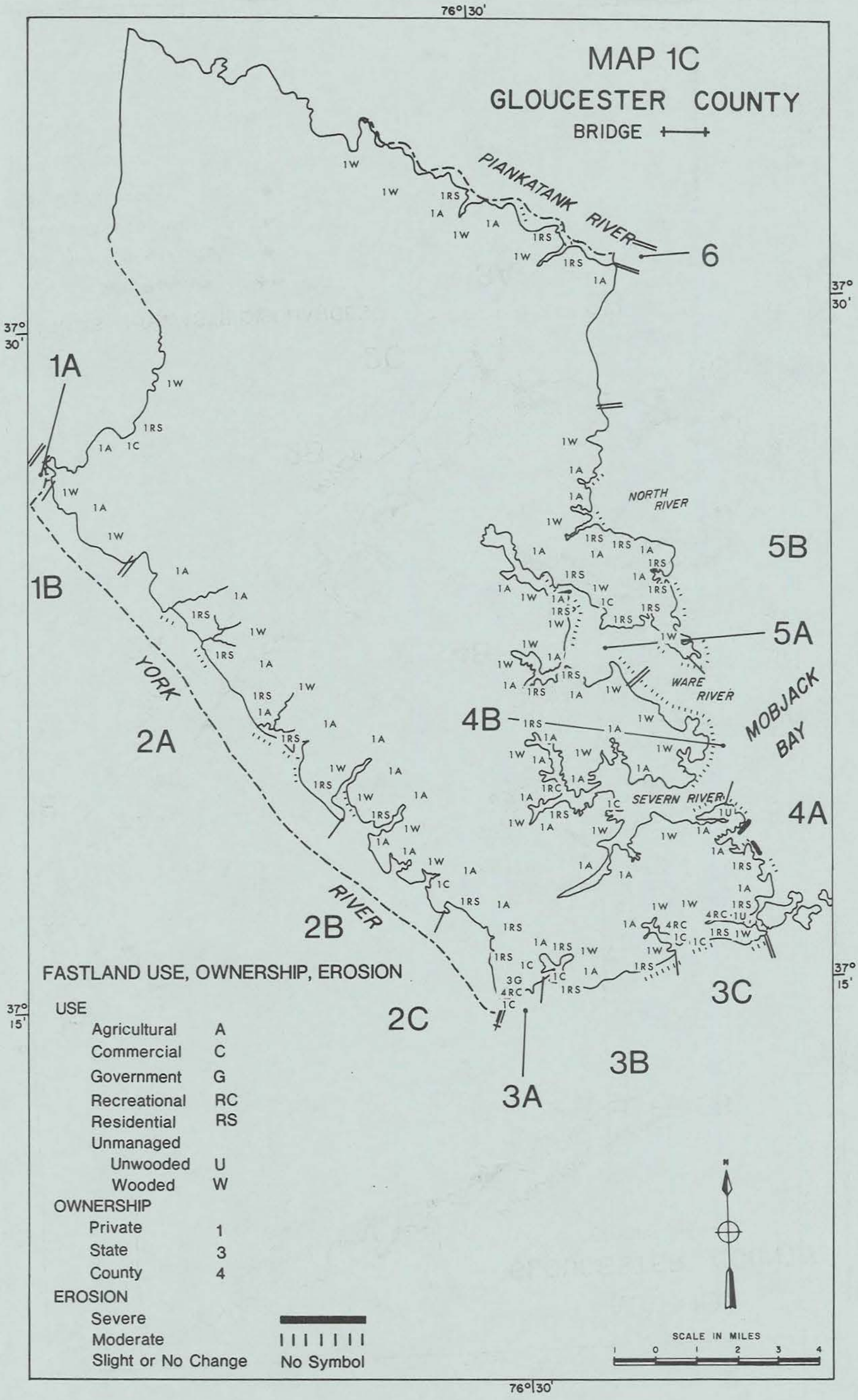
SHORE
- Beach
- Fringe Marsh
- Extensive Marsh
- Embayed Marsh
- Artificially Stabilized

NEARSHORE
- Narrow
- Intermediate
- Wide

N

SCALE IN MILES

1 0 1 2 3 4


76°|30'
MAP 1C
GLOUCESTER COUNTY
BRIDGE
PIANKATANK RIVER
6
37°
30'
1A
1B
2A
2B
2C
3A
3B
3C
4A
4B
5A
5B
6
YORK
RIVER
NORTH
RIVER
WARE
RIVER
MOBJACK
BAY
SEVERN RIVER
37°
15'
FASTLAND USE, OWNERSHIP, EROSION
USE
Agricultural A
Commercial C
Government G
Recreational RC
Residential RS
Unmanaged
Unwooded U
Wooded W
OWNERSHIP
Private 1
State 3
County 4
EROSION
Severe
Moderate
Slight or No Change No Symbol
N
SCALE IN MILES
1 0 1 2 3 4

MAP 1D

GLOUCESTER COUNTY

BRIDGE ⊢⊣

76°|30'

37°|30'

37°|15'

PIANKATANK RIVER

6

1A

1B

YORK RIVER

2A

2B

2C

NORTH RIVER

5B

5A

WARE RIVER

MOBJACK BAY

4B

SEVERN RIVER

4A

3C

3B

3A

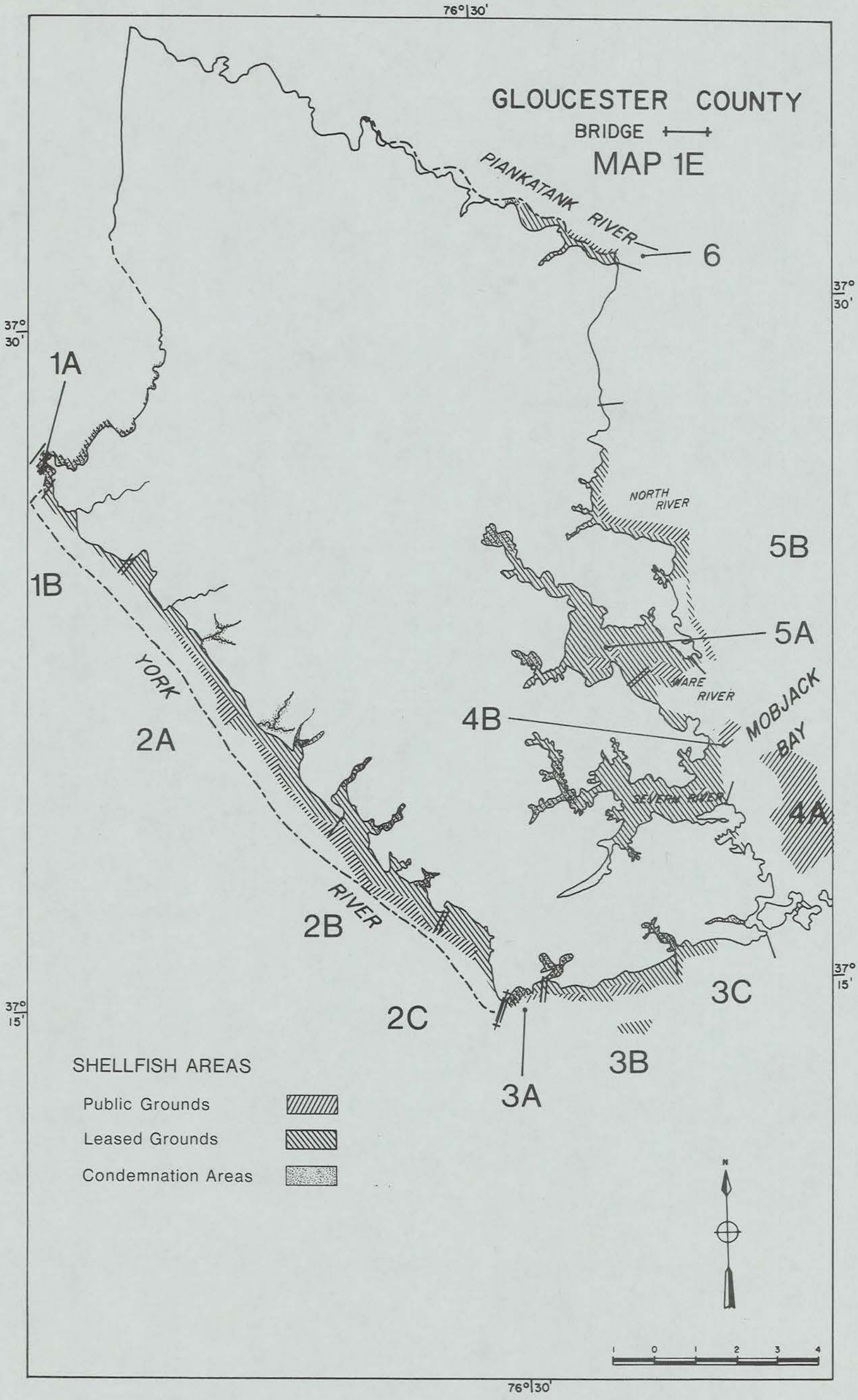
MARINAS AND WASTE DISCHARGES

- Marinas With Ramps
- Marinas Without Ramp
- Public Boat Landings
- Sewage Disposal

N

SCALE IN MILES

1 0 1 2 3 4


76°30'
GLOUCESTER COUNTY
BRIDGE
MAP 1E
PIANKATANK RIVER
6
37°30'
1A
1B
YORK
RIVER
2A
2B
2C
NORTH RIVER
5B
5A
WARE RIVER
MOBJACK BAY
4B
SEVERN RIVER
4A
3C
3B
3A
37°15'
SHELLFISH AREAS
Public Grounds
Leased Grounds
Condemnation Areas
N
1 0 1 2 3 4

CHAPTER 4

4.1 Table of Subsegment Summaries

4.2 Segment and Subsegment Descriptions

4.3 Segment and Subsegment Maps

TABLE 2. SUBSEGMENT SUMMARIES, GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	FLOOD HAZARD	WATER QUALITY	BEACH QUALITY	PRESENT SHORELINE SITUATION	POTENTIAL USE ENHANCEMENT
1A POROPOTANK RIVER 40,650 feet (7.7 mi.)	FASTLAND: Low shore near mouth (50%) and moderately low shore near headwaters (50%). SHORE: Entirely embayed marsh. RIVER: Narrow, meandering tidal river. Channel depths are 6 to 13 feet.	FASTLAND: Unmanaged, wooded (95%) and agricultural (5%). SHORE: Waterfowl hunting and public recreation. RIVER: Commercial fishing.	Private.	High, noncritical, near mouth, low, noncritical, in the upper portions.	Unsatisfactory.	No beaches.	Moderate, noncritical, 1.2 feet per year. There are no shore protective structures.	Minimal. Marshes should be preserved. Low-density housing could be developed around and above the Tanyard Landing area.
1B POROPOTANK BAY TO SOUTHEAST EDGE OF PURTAN BAY 33,100 feet (6.3 mi.)	FASTLAND: Entirely low shore. SHORE: Entirely extensive marsh. NEARSHORE: Poropotank Bay is intermediate, the rest of the subsegment is narrow.	FASTLAND: Unmanaged, wooded. SHORE: Waterfowl hunting. NEARSHORE: Commercial and sport fishing, shellfishing, and hunting.	Private.	High, noncritical.	Unsatisfactory.	No beaches.	Moderate, noncritical.	Minimal. The area should be left in its natural state. The area is not suitable for development due to the high flood hazard and the lowness of the shore and fastland.
2A PURTAN BAY TO BLUNDERING POINT 153,120 feet (29.0 mi.)	FASTLAND: Moderately low shore (86%), with a 10 to 20-foot cliff (14%). SHORE: Embayed marsh (69%), beach (16%), fringe marsh (9%), and artificially stabilized (6%). NEARSHORE: Intermediate width. CREEKS: Narrow and shallow.	FASTLAND: Agricultural (47%), unmanaged, wooded (43%), and residential (10%). SHORE: Private recreation. NEARSHORE: Sport and commercial fishing and shellfishing and various water sports. CREEKS: Private and public recreation and commercial shellfishing. Fox Creek is used as a private and commercial boat access to a marina located near the mouth.	Private.	Low, noncritical, for most of the subsegment. Moderate, critical, at mouths of Jones and Fox Creeks.	Unsatisfactory.	Poor to good. Most beaches are narrow, thin, and covered with shell fragments. SE of Fox Creek there is a good, clean, wide, and relatively thick, sand beach.	Slight or no change to moderate, noncritical (1.5 ft/yr.). There are numerous sets of shore protective structures in this subsegment, most in the form of bulkheading and groins. Most protect residences along the York River shore. Those in the creeks protect marinas and seafood plants. Most of the protective structures are effective.	Moderate. The area will probably continue to develop with riverfront, residential communities.
2B BLUNDERING POINT TO SOUTH EXTENT OF CARMINES LANDING 167,000 feet (31.6 mi.)	FASTLAND: Moderately low shore (55%) and low shore (45%). SHORE: Fringe marsh (40%), extensive marsh (45%), and embayed marsh (14%). NEARSHORE: Intermediate width. CREEKS: Narrow (400 ft.), shallow, tidal creeks, with muddy bottoms.	FASTLAND: Unmanaged, wooded (70%), agricultural (18%), and residential (12%). SHORE: Private recreation, boat access, and waterfowl hunting. NEARSHORE: Sport and commercial fishing, shellfishing, water sports, and waterfowl hunting. CREEKS: Private and commercial boat access, some crabbing.	Private.	Low, noncritical for most of the subsegment. Moderate, critical in and around Carmines Landing.	Unsatisfactory.	No beaches.	Slight or no change. There is 300 feet of bulkhead on south Carmines Island. It is deteriorated and is ineffective.	Minimal. Any development should be restricted to higher parts of the fastland. The Catlett Islands should remain undeveloped.
2C CARMINES ISLANDS TO THE G.P. COLEMAN BRIDGE 25,200 feet (4.8 mi.)	FASTLAND: Moderately low shore (77%) and low shore (23%). SHORE: Beach (66%), fringe marsh (17%), and artificially stabilized (17%). NEARSHORE: Wide to narrow.	FASTLAND: Residential (92%) and governmental (8%). SHORE: Private recreation and scientific experiments. NEARSHORE: Sport and commercial fishing, water sports, shellfishing, and waterfowl hunting.	Private and State.	High, critical for lowlands at Gloucester Point. Low, noncritical elsewhere.	Unsatisfactory.	Poor except for the beach at Gloucester Point, which is fair.	Slight or no change (0.6 ft/yr.). This is a significant amount considering a 20 to 30-foot cliff is eroding. There are eight sets of shore protective structures, most of which are groins and bulkheads. There are two rock jetties. The jetties on the VIMS shoreline are ineffective. They should be re-established and should be made higher. The effectiveness of the rest of the structures vary, depending on the local supply of sand.	Low. Most of the shoreline is already developed as a residential area.
3A GEORGE P. COLEMAN BRIDGE TO SARAH'S CREEK 8,000 feet (1.5 mi.)	FASTLAND: Moderately low shore with bluff (67%) and low shore (33%). SHORE: Artificially stabilized (73%) and beach (27%). NEARSHORE: Narrow near bridge, intermediate off the creek entrance.	FASTLAND: Residential (80%), state (10%), and commercial (10%). SHORE: Private and public recreation. NEARSHORE: Fishing, shellfishing, water sports, scientific experiments associated with VIMS, and as access to Sarah Creek.	Private 90% and State 10%.	Moderate, critical at bridge. Low, noncritical elsewhere.	Intermediate.	Poor to good.	Slight or no change due to the numerous applications of shore protective structures (usually bulkheads with or without groins). Most bulkheads are effective except those that were poorly constructed. The only groins that are effective are those that are being fed by an offshore bar.	Minimal. Present use by the state (VIMS) and by residences preclude much other use. However, the public beach near the bridge could support additional recreational use, if properly planned.
3B SARAH CREEK TO CUBA ISLAND 115,600 feet (21.9 mi.)	FASTLAND: Low shore. SHORE: Fringe marsh (65%), artificially stabilized (22%), and beach (13%). NEARSHORE: Intermediate. CREEKS: Wide. Dendritic, narrow, 6-foot channel runs through most of the subsegment.	FASTLAND: Residential (76%), unmanaged, wooded (20%), and commercial (4%). SHORE: Private recreation. NEARSHORE: Shellfishing, commercial and sport fishing, and waterfowl hunting. Maintained channel provides access to Sarah Creek. CREEK: Access to the York River for private and commercial boats.	Private.	Sarah Creek is moderate, critical. From Sarah Creek to Gaines Point, low, critical. Between Gaines Point and Cuba Island, high, critical.	Intermediate.	Fair.	Slight or no change to moderate, noncritical. There are many installations of bulkheads and groins in Sarah Creek. All the structures are moderately effective being mainly inhibited by a sufficient supply of sand.	Potential for public recreation is low. There is room for some additional residential development, especially in Sarah Creek. Any changes should be executed with the total environment in mind.

TABLE 2 (con'd.)

SUBSEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	FLOOD HAZARD	WATER QUALITY	BEACH QUALITY	PRESENT SHORELINE SITUATION	POTENTIAL USE ENHANCEMENT
3C CUBA ISLAND TO EASTERN EXTENT OF JENKINS NECK 64,000 feet (12.1 mi.)	FASTLAND: Low shore. SHORE: Beach (76%), embayed marsh (10%), artificially stabilized (10%), and fringe marsh (4%). NEARSHORE: Intermediate with tidal flats.	FASTLAND: Residential (42%), agricultural (39%), and unmanaged, wooded (19%). SHORE: Some swimming areas. NEARSHORE: Commercial and sport fishing, boating, water sports, and shellfishing.	Private.	High, critical along the York River shore. Moderate, critical along the Perrin River.	Intermediate.	Fair.	Moderate, critical, from Sandy Point to the mouth of the Perrin River. Slight or no change elsewhere in the subsegment. There is 6,400 feet of bulkheading with or without groins. Those structures in good repair are effective.	Minimal, due to the low contour of the fastland, the high flood hazard, and the moderate erosion rate.
4A JENKINS NECK TO NORTHERN GUINEA NECK 141,600 feet (26.8 mi.)	FASTLAND: Low shore. SHORE: Extensive marsh (99%) and fringe beach (1%). NEARSHORE: Wide (94%) and intermediate (6%).	FASTLAND: Agricultural (45%), unmanaged, wooded (40%), and residential (15%). SHORE: Waterfowl hunting. NEARSHORE: Commercial and sport fishing, and shellfishing.	Private.	High, critical.	Unsatisfactory.	Poor.	Slight or no change for most of the subsegment. On Jenkins Neck at the end of Route 646 there is moderate, critical erosion. There is severe, noncritical erosion at a marsh on John West Creek. There are no protective structures.	Low. The lowness of the fastland prohibits residential development, and the lack of good beaches limits the recreational potential.
4B SEVERN RIVER 342,000 feet (64.8 mi.)	FASTLAND: Low shore. SHORE: Fringe marsh (79%), beach (9%), embayed marsh (8%), extensive marsh (3%), and artificially stabilized (1%). NEARSHORE: Narrow along the Severn River River, intermediate along the Mobjack Bay.	FASTLAND: Agricultural (40%), unmanaged, wooded (40%), residential (15%), commercial (3%), and recreational (2%). SHORE: Waterfowl hunting. NEARSHORE: Commercial and sport fishing, shellfishing, and water sports.	Private.	High, critical.	Unsatisfactory.	Poor.	No data available for the Severn River. There is moderate, noncritical erosion from Turtle Neck Point north to the end of the subsegment. There is about 6,000 feet of bulkheading, mostly at Saddlers Neck, and a few scattered groins. Most structures are moderately effective.	This area has a prime potential for residential development. However, any developments should be carefully planned. The marshes should always be preserved.
5A WARE RIVER 172,400 feet (32.7 mi.)	FASTLAND: Low shore. SHORE: Fringe marsh (88%), embayed marsh (8%), and artificially stabilized (4%). RIVER: Narrow from Jarvis Point to Ware Neck Point and off Roanes Wharf; intermediate east of the mouth of Wilson Creek. CREEK: Broad, shallow, dendritic, tidal creek.	FASTLAND: Unmanaged, wooded (50%), agricultural (40%), and residential (10%). SHORE: Waterfowl hunting. RIVER: Commercial and sport fishing, water sports, and shellfishing.	Private.	High, noncritical along the mouth of the river. High, critical at Jarvis Point and Baileys. Moderate, noncritical for the rest of the subsegment.	Satisfactory.	Poor.	Slight or no change to severe, noncritical. The western shore of Ware Neck experiences the most erosion. Here, rates range from 1.4 to 3.3 feet per year. There is 7,400 feet of bulkheading, some with groins. All structures seem moderately effective.	There is room for additional residential development. However, it should be restricted to the higher fastland. All marshes should be left in their natural state.
5B NORTH RIVER 150,000 feet (28.4 mi.)	FASTLAND: Low shore. SHORE: Fringe marsh (88%), embayed marsh (8%), and artificially stabilized (4%). RIVER: Intermediate to Lone Point; narrow from Lone Point to Belleville Creek.	FASTLAND: Agricultural (50%), unmanaged, wooded (47%), and residential (3%). SHORE: Private access and recreation. RIVER: Water sports, sport fishing, and commercial shellfishing.	Private.	High, critical along eastern front of Ware Neck, moderate, noncritical for the rest of the subsegment.	Intermediate.	No beaches.	Slight or none to moderate, noncritical. There is bulkheading, most of it with groins and some riprapping. All structures appear effective.	Additional housing development will continue but should be restricted to the higher fastland. All marshes should be left in their natural state.
6 PIANKATANK RIVER 152,000 feet (28.8 mi.)	FASTLAND: Low shore (84%), low shore with bluff (2%), and moderately low shore with bluff (14%). SHORE: Fringe marsh (83%), embayed marsh (12%), beach (4%), and artificially stabilized (1%). RIVER: Narrow from the segment start to Cooper Point. From there the river has average depths of less than 4 feet.	FASTLAND: Agricultural (47%), unmanaged, wooded (41%), residential (10%), and recreational (2%). SHORE: Private recreation. RIVER: Water sports, sport fishing, and commercial shellfishing.	Private.	Moderate, critical from the segment's start to Blands Wharf. Low, noncritical elsewhere.	Intermediate.	Poor.	Slight or no change except for some places between French and Perry Creeks, where it is moderate, noncritical. The only area of protective structures is some bulkheading southeast of Anderson Point.	Marshes should be left in their natural state. The higher ground properties can be developed.

POROPOTANK RIVER, GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 1A (Maps 2A, 2B, and 2C)

EXTENT: 40,650 feet (7.7 mi., 265 ac.) from the headwaters of the Poropotank River to its mouth.

SHORELANDS TYPE
FASTLAND: Low shore 50% (3.8 mi.), near its mouth and moderately low shore 50% (3.9 mi.), near the headwaters.
SHORE: Entirely embayed marsh (237 acres).
RIVER: Narrow (400 ft.), meandering, tidal river. Depths range from 6 to 13 feet in the channel. The channel entrance is marked with buoys.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 95% (7.3 mi.) and agricultural 5% (0.4 mi.).
SHORE: Waterfowl hunting and boat launching (Miller and Tanyard public landings).
RIVER: Commercial fishing.

OWNERSHIP: Private.

FLOOD HAZARD: High, noncritical near the mouth, low, noncritical in the upper portions.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: There are no beaches in this subsegment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Moderate, noncritical, 1.2 feet per year. The area of marshes at the mouth of Poropotank River and around Morris Bay have lost approximately 11 acres in the last 100 years.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are two piers at Tanyard Landing.

POTENTIAL USE ENHANCEMENT: Minimal. The marshes should be preserved and maintained in their natural state. The area around Tanyard Landing and above could be developed with low density housing.

MAPS: USGS, 7.5 Min.Ser. (Topo.), GRESSIT Quadr., 1965.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS 06Nov73 GL-1A/255-276.

POROPOTANK BAY TO SOUTHEAST EDGE OF PURTAN BAY, GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 1B (Maps 2A, 2B, and 2C)

EXTENT: 33,100 feet (6.3 mi.) from the Poropotank Bay to the southeast edge of Purtan Bay, including Adams Creek.

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Extensive marsh.
NEARSHORE: Poropotank Bay is intermediate, the remainder of the subsegment is narrow.

SHORELANDS USE
FASTLAND: Unmanaged, wooded.
SHORE: Waterfowl hunting.
NEARSHORE: Commercial and sport fishing, shellfishing, and hunting.

OFFSHORE: The York River Channel lies less than 200 yards offshore of Purtan Island. The channel maintains depths of 32 feet throughout its extent along this subsegment. It is marked with lighted and regular buoys.

WIND AND SEA EXPOSURE: The shoreline trend is from NW to SE. Fetches are from the NW - 5.7 miles, W - 1.7 miles, SW - 1.0 miles, and S - 1.7 miles.

OWNERSHIP: Private.

FLOOD HAZARD: High, noncritical.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: There are no beaches in this subsegment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Moderate, noncritical. Historically the areas most affected have been the marshes of Purtan Island and around West End. Here, the York River portions of the shore have been eroding at a rate of approximately 2.2 feet per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There is one pier at West End.

POTENTIAL USE ENHANCEMENT: The area should be preserved in its natural state. The lowness of the shore and immediate fastland and the high flood hazard would put houses in jeopardy if they were to be established.

MAPS: USGS, 7.5 Min.Ser. (Topo.), GRESSIT, Quadr., 1965.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS 06Nov73 GL-1B/246-254.

PURTAN BAY TO BLUNDERING POINT,

GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 2A

(Maps 2A, 2B, 2C, 3A, 3B, 3C, and 4A, 4B, 4C)

EXTENT: 153,120 feet (29.0 mi.) from Purtan Bay to Blundering Point which includes Purtan (2.6 mi.), Leigh (1.3 mi.), Bland (4.4 mi.), Fox (2.8 mi.), Sandy (1.6 mi.), Jones (3.6 mi.), and Aberdeen (4.2 mi.) tidal creeks.

SHORELANDS TYPE

FASTLAND: Moderately low shore 86% (25.0 mi.) with the remaining 4 miles of shoreline along the York River backed by 10 to 20-foot cliffs.
SHORE: Embayed marsh 69% (20.0 mi.), beach 16% (4.6 mi.), fringe marsh 9% (2.6 mi.), and artificially stabilized 6% (1.7 mi.).
NEARSHORE: Intermediate. Along the York River the shelf is shallow but drops off quickly to deeper water at the 6-foot contour. Bottom material is primarily a sandy-mud.
CREEKS: The creeks are generally shallow, narrow, dendritic, embayed marsh, tidal creeks.
Purtan Creek: 93 acres of marsh, shallow, muddy bottomed, with forested fastland.
Leigh Creek: 17 acres of marsh, shallow, muddy bottomed, with northwest fastland forested and southeast fastland being agricultural fields.
Bland Creek: 80 acres of marsh, shallow, muddy bottomed, embayed marsh with forested fastland.
Purtan Bay: Shallow, with a maximum depth of 4 feet. The above mentioned three creeks drain into this bay.
Fox Creek: 60 acres of marsh, shallow, muddy bottomed, embayed marsh. Fastland is forested in portions, other portions are agricultural fields.
Sandy Creek: 47 acres of marsh, shallow, muddy bottomed, embayed marsh with forested fastland.
Jones Creek: 228 acres of marsh, shallow, muddy bottomed, embayed marsh creek with fastland used for agriculture.
Aberdeen Creek: 68 acres of marsh. Upper branches are shallow, muddy bottomed, embayed marsh creeks. Lower portion is 700 feet wide with a marked and maintained channel. Controlling depth is 6 feet. Fringe marsh occurs along this portion of the creek. Channel entrance is flanked by two small marsh covered spits.

SHORELANDS USE

FASTLAND: Agricultural 47% (13.6 mi.), unmanaged, wooded 43% (12.5 mi.), and residential 10% (2.9 mi.).
SHORE: Private recreation.
NEARSHORE: Sport and commercial fishing and shellfishing and various other water sports.
CREEKS: Private recreation and commercial shellfishing. There is a public landing in Aberdeen Creek and numerous commercial fishing boats use the creek for berthing and as access to a commercial shellfish operation. Fox Creek is used for private and commercial boat access to a marina located near the mouth.

OFFSHORE: The York River Channel lies directly offshore. The channel is marked by lighted and unlighted buoys. Depths range from 30 to 44 feet. Numerous tugboats and small freighters use the channel as access to West Point.

WIND AND SEA EXPOSURE: The shoreline is oriented NW to SE. Fetches are from the NE - 8 miles, E - 2 miles, SE - 2½ miles, and S - 7 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical except for the residences near the mouth of Jones Creek and the buildings at the mouth of Fox Creek which are moderate, critical.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: Poor to good. Most of the beaches are narrow and thin. Also, the nearshore zone contains many areas of broken shell fragments which warrant caution when beaches are used for swimming or crabbing. However, there is one beach which exists immediately southeast of Fox Creek that is excellent. It is wide for an upper river beach, clean, and relatively thick.

PRESENT SHORE EROSION SITUATION

EROSION RATE: Historically the rate ranges from slight or no change (0.4 ft/yr.) to moderate, noncritical (1.5 ft/yr.).
ENDANGERED STRUCTURES: None.

SHORE PROTECTIVE STRUCTURES: There are numerous sets of shore protective structures in this subsegment. These are associated with the small residential developments which occur along the York River portions of the shoreline. At Almondsville there is approximately 500 feet of ineffective bulkhead due to poor construction. One quarter mile north of Fox Creek there are 5 groins of moderate effectiveness. At Fox Creek there is extensive bulkheading, protecting the marina facilities, and jetties on the sides of the entrance of the creek. Most of this is in a deteriorating condition allowing leaching. At Capahosic there is 2,300 feet of bulkheading of moderate to poor effectiveness. Some of this is in a deteriorating condition and being flanked. Associated with these emplacements is 2,700 feet of concrete bulkheading at Clay Bank. This is working fairly well but could use weep holes and possibly additional toe protection. Along the northern peninsula of Aberdeen Creek there is approximately 900 feet of effective bulkheading. Within Aberdeen Creek there is approximately 300 feet of bulkheading preventing boat wake erosion. Between Gum Point and Aberdeen Creek there is 1,800 feet of bulkheading and 7 groins. For the most part this seems effective but there are signs of flanking towards the north end. Between Gum Point and Blundering Point there is one installation of approximately 800 feet of good to fairly effective bulkheading with 22 groins. Just north of Jones Creek there is about 500 feet of effective bulkhead.

Suggested Action: Repair deteriorated bulkheads and those that are being flanked to stop further erosion. In several areas elsewhere in the subsegment, the establishment of a marsh grass planting program could be implemented. If this were a well planned program it could, in many areas, be more effective than structures.

OTHER SHORE STRUCTURES: There are 77 piers and docks of various lengths within this subsegment.

POTENTIAL USE ENHANCEMENT: This subsegment will probably continue to develop with riverfront, residential communities. With this continued pressure will arise the demand for shore

protection and recreational beaches. Preferably, the measures taken to control the erosion problem should be approached through a comprehensive plan rather than individual, stop-gap, measures. As for the beaches, they have limited potential for recreational use. However, several areas could be enhanced through beach nourishment.

MAPS: USGS, 7.5 Min.Ser. (Topo.), GRESSIT Quadr., 1965,
USGS, 7.5 Min.Ser. (Topo.), WILLIAMSBURG Quadr., 1965, and
USGS, 7.5 Min.Ser. (Topo.), CLAY BANK Quadr., 1965, Pr. 1972.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS GL-2A/197-245.

BLUNDERING POINT TO SOUTH EXTENT OF CARMINES ISLANDS

GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 2B (Maps 4A, 4B, 4C, and 5A, 5B, 5C)

EXTENT: Approximately 167,000 feet (31.6 mi.) of shoreline, from Blundering Point to the southerly extent of Carmines Islands.

SHORELANDS TYPE
FASTLAND: Moderately low shore 55% (17.4 mi.) and low shore, behind the Catlett and Carmines Islands, 45% (14.2 mi.).
SHORE: Extensive marsh 45% (14.2 mi.), fringe marsh 40% (12.9 mi.), and embayed marsh 14% (4.5 mi.).
NEARSHORE: Intermediate with extensive mud flats surrounding the Catlett and Carmines Islands.
CREEKS: Approximately 400 feet wide, shallow, tidal creeks, with muddy bottoms.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 70% (22.2 mi.), agricultural 18% (5.6 mi.), and residential 12% (3.8 mi.).
SHORE: Private recreation, boat access, and waterfowl hunting.
NEARSHORE: Sport and commercial fishing, shellfishing, water sports, and waterfowl hunting.
CREEKS: Private and commercial boat access and crabbing.

OFFSHORE: The York River Channel lies approximately one mile offshore. The sides of the channel assume a moderate slope from the river shelf to the bottom of the channel. Depths range from 30 feet to 60 feet in the channel. The central portion of the channel is restricted as noted on C&GS chart # 495. The channel is used extensively by large naval ships, freighters in transit to West Point and numerous private and naval tugs.

WIND AND SEA EXPOSURE: The basic orientation of the shoreline is NW to SE. Fetches are from the W - 4 miles, SW - 2 miles, and S - 2½ miles.

OWNERSHIP: Private.

FLOOD HAZARD: Low, noncritical except for structures in and around Carmines Landing which are moderate, critical.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: There are no beaches in this subsegment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change. Historically the rate of shoreline retreat is approximately 0.7 feet per year. The area most affected by erosion has been the Catlett Islands which have lost approximately 56 acres in the last 100 years. Also the shore between Carter Creek and Cedarbush Creek has lost approximately 33 acres in the same time span.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: There is approximately 300 feet of old bulkhead on south Carmines Island. It is in a deteriorating condition and is completely ineffective.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are 42 piers along the shore of this subsegment. A foot bridge spans a small branch of upper Timberneck Creek.

POTENTIAL USE ENHANCEMENT: Any development in this subsegment should be restricted to the higher portions of the fastland. The Catlett Islands should be left undeveloped. Development there would cause damage to the ecologically valuable marsh which is protected by the Virginia Wetlands Law of 1972.

MAPS: USGS, 7.5 Min.Ser. (Topo.), CLAY BANK Quadr., 1965, Pr. 1972.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS 06Nov73 GL-2B/132-196.

CARMINES ISLANDS TO GEORGE P. COLEMAN BRIDGE,
GLOUCESTER COUNTY, VIRGINIA
SUBSEGMENT 2C (Maps 5A, 5B, and 5C)

EXTENT: Approximately 25,200 feet (4.8 mi.) from the southeast edge of Carmines Islands to the George P. Coleman Bridge.

SHORELANDS TYPE
FASTLAND: Moderately low shore 77% (3.7 mi.) and low shore 23% (1.1 mi.).
SHORE: Beach 66% (3.2 mi.), fringe marsh 17% (0.8 mi.), and artificially stabilized 17% (0.8 mi.).
NEARSHORE: Wide to narrow with sandy-mud bottom sediments on the shelf. The 12-foot contour is less than 50 feet from the shore at the George P. Coleman Bridge.

SHORELANDS USE
FASTLAND: Residential 92% (4.4 mi.) and governmental, state, 8% (0.8 mi.).
SHORE: Private recreation and scientific experiments at the Virginia Institute of Marine Science at Gloucester Point.
NEARSHORE: Water sports, sport and commercial fishing, shellfishing, and waterfowl hunting.

OFFSHORE: The York River Channel lies offshore with depths ranging from 33 to 73 feet. It is used extensively by commercial and naval ships. Also, numerous tugboats and their tows traffic this channel.

WIND AND SEA EXPOSURE: The general shoreline trend is N to NE and S to SE. Fetches are from the NW - 1.8 miles, W - 2.2 miles, SW - 1.4 miles, and S - 1.4 miles.

OWNERSHIP: Private and State.

FLOOD HAZARD: Low, noncritical except for the lowlands at Gloucester Point which are high, critical.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: All the beaches except those at Gloucester Point are narrow and thin. The beach at Gloucester Point is a medium width, clean, sand beach. Here, the nearshore zone is floored by muddy-sand and affords good swimming only at high water.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change. Historically, the rate has been 0.6 feet per year. Although this is not high, it is significant when considering that a 20 to 30-foot high cliff is being eroded.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: There are eight sets of shore protective structures within this subsegment. They are either bulkhead or bulkhead and groin installations. With the exception of the jetties at the inlet to the VIMS marina, all structures are effective.

Suggested Action: The two jetties at the entrance to the VIMS marina should be heightened. Sand is overflowing the top of the jetty and partially blocking the inlet. Elsewhere, a policy of reducing the slope of the cliffs behind stabilized areas should be implemented. Also, building structures closer than a predetermined distance (determined by the erosion rate) would be discouraged. To not follow this policy would lead to endangered structures due to erosion.

Between county Routes 1303 and 1305 a section of the shoreline has been dredged immediately adjacent to the shore. This type of action, be it in front of a beach or in front of a bulkhead, should be stopped. It leads to accelerated erosion, creates a settling basin which deteriorates the water quality and leads to continued maintenance problems.

OTHER SHORE STRUCTURES: There are 22 piers in this subsegment.

POTENTIAL USE ENHANCEMENT: Low. Most of the shoreline is already developed to a maximum as a residential area.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), CLAY BANK Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), YORKTOWN Quadr., 1965, Pr. 1970.
C&GS, #495, 1:40,000 scale, YORK RIVER, Yorktown to West Point, 1973.

PHOTOS: Aerial-VIMS 150ct73 GL-2C/90;
06Nov73 GL-2C/112-134.

GEORGE P. COLEMAN BRIDGE TO SARAH CREEK,

GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 3A (Maps 5A, 5B, and 5C)

EXTENT: 8,000 feet (1.5 mi.) from the George P. Coleman Bridge to Sarah Creek.

SHORELANDS TYPE

FASTLAND: Moderately low shore with bluff 67% (1.0 mi.) and low shore 33% (0.5 mi.).
SHORE: Beach 27% (0.4 mi.) backed by artificial stabilization 73% (1.1 mi.).
NEARSHORE: Narrow near the bridge, reaching intermediate off the creek entrance.

SHORELANDS USE

FASTLAND: Residential 80% (1.2 mi.), state owned marine research facility 10% (0.2 mi.), and commercial 10% (0.1 mi.).
SHORE: Private and public recreation. Public recreation is limited to two, small, public beaches. One is near the bridge and the other, called Waterview, is located approximately half way between the bridge and Sarah Creek.
NEARSHORE: Commercial and sport fishing and shellfishing, water sports (boating, swimming, skiing, etc.), and scientific experiments associated with the Virginia Institute of Marine Science. The nearshore is also used as an access to Sarah Creek and its' tributaries.

OFFSHORE: The channel is approximately 400 yards from the shore, except near the bridge, where the channel lies very close to the shore. The York River Channel experiences heavy use by commercial and military ships.

OWNERSHIP: Private 90% and State 10%.

FLOOD HAZARD: Moderate, critical for the portions of the subsegment adjacent to the bridge. Elsewhere the flood hazard is low, noncritical.

WATER QUALITY: Intermediate.

BEACH QUALITY: Poor to good. The section of beach near the bridge is good, the rest of the length of the subsegment has thin, narrow, beaches.

PRESENT SHORE EROSION SITUATION

EROSION RATE: Slight or no change. In the past this subsegment has experienced shoreline retreat of approximately 1 foot per year. Except in a few sections this retreat has been stopped due to extensive applications of shoreline defense structures.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: Approximately 70% of the shoreline in this subsegment is protected by structures. The primary type of structure is bulkheading, with or without groins. The proliferation of structures along this subsegment have been effective in halting the retreat of the shoreline. However, several installations of bulkheading have failed due to improper construction techniques. In several cases the lack of tongue and groove sheet pile and filter cloth has led to leaching of fastland material through the bulkhead. In two instances concrete bulkheads failed due to inadequate penetration of the structure below the erosion envelope of the beach. In one case severe leaching occurred during the December, 1974 storm. The other concrete bulkhead was overtopped, undercut, and almost completely destroyed.

This subsegment has a limited amount of sand available to maintain its beaches. Prior to the construction of the bulkheading, sand was supplied from the eroding fastland. Much of this source has now been eliminated. Therefore, the beaches are forced to maintain themselves with existing beach sand and rely on the transport of sand to the shore from the offshore bars. The limited knowledge of bar transport indicates that this amount is small. Also, vertical structures tend to eliminate sand in front of them unless there is a wide, high, beach with continued input of sand from littoral transport. As the beaches are neither wide nor high they may be overtopped during storms. This overtopping leads to turbulence generated at the base of the bulkhead which removes the sand to an offshore bar.

The numerous groins along this subsegment are, with few exceptions, not effective. Their primary function has been to lock an existing beach in place. In those areas where they have been effective there appears to be a relationship of that area to an offshore bar which is apparently feeding some sand to the beach. Where this relationship does not exist, the groins have not been effective.

Suggested Action: To provide adequate beaches along this subsegment would require a comprehensive study of the area. The resultant plan would require a unified solution shared by all property owners.

OTHER SHORE STRUCTURES: There are twelve piers along this subsegment. Three are state owned, the rest are private. Two of the state owned piers service research vessels associated with the marine laboratory.

POTENTIAL USE ENHANCEMENT: For most of the subsegment, present use by the Virginia Institute of Marine Science and by residential use preempt any alternate use of the shorelands. The area with the greatest use potential is that near the bridge. Here, the extended public beach and the new ramp facilities have already greatly increased the recreational usage of this area. However, present parking facilities should be upgraded, particularly due to the great number of vehicles with trailers. The nearshore is generally good for swimming except near the commercial pier at the end of the point. In this area the currents can be extremely swift and the nearshore bottom drops off close to the shore. Therefore, lifeguarding facilities should be instituted as this area will experience an ever increasing heavy use.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), CLAY BANK Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), POQUOSON WEST Quadr., 1965, Pr. 1970.
USGS, 7.5 Min.Ser. (Topo.), YORKTOWN Quadr., 1965, Pr. 1970.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 06Nov73 GL-3A/73-90.

SARAH CREEK TO CUBA ISLAND,

GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 3B (Maps 5A, 5B, 5C, and 6A, 6B, 6C)

EXTENT: 115,600 feet (21.9 mi.) from Sarah Creek to Cuba Island. Sarah Creek is included in the subsegment.

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Fringe marsh 65% (14.2 mi.), artificially stabilized 22% (4.9 mi.), and beach 13% (2.8 mi.).
NEARSHORE: Intermediate, shallow flats.
CREEK: Wide, dendritic, with a narrow 6-foot channel through most of the two main branches.

SHORELANDS USE
FASTLAND: Residential 76% (16.6 mi.), unmanaged, wooded 20% (4.4 mi.), and commercial 4% (0.9 mi.).
SHORE: Private recreation.
NEARSHORE: Shellfishing, waterfowl hunting, and commercial and sport fishing. Lighted and maintained channel provides access to Sarah Creek.
CREEK: Access for private and commercial boats to and from the York River.

OFFSHORE: The main York River Channel lies 1,760 yards off the entrance to Sarah Creek. The channel is 800 yards wide and approximately 50 feet deep. There is heavy commercial and military shipping plying this channel. Also, heavy commercial and sport fishing occurs during the appropriate seasons.

WIND AND SEA EXPOSURE: Basic orientation of the shore is E to W. Fetches are from the SW - $3\frac{3}{4}$ miles, S - $2\frac{1}{2}$ miles, SE - $3\frac{1}{4}$ miles and E - 22 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Sarah Creek is moderate, critical. The section between Sarah Creek and Gaines Point is low, critical and between Gaines Point and Cuba Island is high, critical.

WATER QUALITY: Intermediate.

BEACH QUALITY: Fair. The beaches are of moderate width and thickness but offer little protection during high water and storm conditions.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change to moderate, noncritical. The central section is the most severely affected with a rate of 1.4 feet per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: There are 21 bulkhead installations within Sarah Creek. Around Quarter Point there is extensive bulkheading with one groin application. On the east side of Gaines Point there are 26 groins. In the middle section of the subsegment off of county Route 642 there are three installations of groins and bulkheads. All the installations are moderately effective being mainly inhibited by a sufficient supply of sand.

Suggested Action: Serious consideration should be given to an overall plan for erosion control in this subsegment. As most of the sand comes from local sources of erosion, further reduction of input by installation of bulkheads could seriously affect the nature of the beaches throughout the subsegment.

OTHER SHORE STRUCTURES: There are 86 piers in this subsegment.

POTENTIAL USE ENHANCEMENT: Potential development for public use is low in this subsegment. However, additional residential development, particularly in Sarah Creek, is going to subject the creek to changes facilitating waterfront residence. These being oriented in providing access to personal boats. These changes, in the form of dredged channels, bulkheads, piers, etc., should be executed with the total environment in mind. Specifics on these considerations are available from the Gloucester County Wetlands Board, the Virginia Institute of Marine Science, and the Corps of Engineers.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), POQUOSON WEST Quadr., 1965, Pr. 1970.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 150ct73 GL-3B/44-74.

CUBA ISLAND TO EASTERN EXTENT OF JENKINS NECK,

GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 3C (Maps 6A, 6B, 6C, and 7A, 7B, 7C)

EXTENT: 64,000 feet (12.1 mi.) of shoreline from Cuba Island to the eastern extent of Jenkins Neck, including the Perrin River and the creek between the Perrin River and Jenkins Neck.

SHORELANDS TYPE

FASTLAND: Entirely low shore.

SHORE: Narrow, fringe beach 76% (9.2 mi.), embayed marsh near the headwaters of the Perrin River 10% (1.2 mi.), fringe marsh around Cuba Island 4% (0.5 mi.), and artificially stabilized (bulkheads and/or groins) 10% (1.2 mi.).

NEARSHORE: Intermediate with tidal flats.

SHORELANDS USE

FASTLAND: Residential (along the fastland-shore interface) 42% (5.1 mi.), agricultural 39% (4.7 mi.), and unmanaged, wooded 19% (2.3 mi.).

SHORE: Some small beaches are used as swimming areas.

NEARSHORE: Boating, water sports, commercial and sport fishing, and shellfishing.

OFFSHORE: The York River Channel, about 2,000 yards offshore, has depths of at least 32 feet. The channel is marked by lighted and regular buoys.

WIND AND SEA EXPOSURE: The shoreline in this subsegment trends E to W. Fetches at midpoint of the section are S - 1.7 miles, SE - unlimited, and ESE - unlimited.

OWNERSHIP: Private.

FLOOD HAZARD: High, critical. Along the York River shoreline interface, many residences are below the 5-foot contour. Moderate, critical along the Perrin River, where dwellings are generally above the 5-foot contour.

WATER QUALITY: Intermediate.

BEACH QUALITY: Fair. Most of the beaches are narrow. The spit to the east of the mouth of Perrin River is a rather broad beach, and the shoreline parallel to the last 1,200 feet of Route 646 on Jenkins Neck has a very broad and nice beach.

PRESENT SHORE EROSION SITUATION

EROSION RATE: Moderate, critical (1.9 ft/yr.) from Sandy Point to the sand beach spit at the mouth of the Perrin River. Elsewhere in the subsegment, there is slight to no erosion.

ENDANGERED STRUCTURES: Residences along the shoreline from Sandy Point to the sand spit are endangered.

SHORE PROTECTIVE STRUCTURES: There is 6,400 feet of bulkheading and/or groins, mostly located along Jenkins Neck, which experiences winds and seas from the Bay. Those bulkheads which are in good repair are effective. The others are not effective primarily due to poor construction techniques or old age. Several groins are flanked or were never properly tied to existing bulkheads.

Suggested Action: The broken or old bulkheads should be repaired and the flanked groins should be properly tied to the bulkheads or the bank. In other areas consideration should be given to using shorter groins or a sill. The sill arrangement could be implemented with or without groins.

OTHER SHORE STRUCTURES: There are approximately 43 piers.

POTENTIAL USE ENHANCEMENT: Minimal. Due to the low contour of the fastland, special emphasis in any residential building must be given the high flood hazard and, on Jenkins Neck, the moderate erosion threat. Generally, moderate growth of the present residential use is considered best.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 150ct73 GL-3C/11-43.

JENKINS NECK TO NORTHERN GUINEA NECK,
GLOUCESTER COUNTY, VIRGINIA
SUBSEGMENT 4A (Maps 7A, 7B, 7C)

EXTENT: 141,600 feet (26.8 mi.) of shoreline from the eastern extent of Jenkins Neck to the Severn Triangulation on Guinea Neck. Including John West Creek, Blevins Creek, and Browns Bay. Not included in the subsegment measurement are the Great Island Marshes (17,200 ft.), Hog Island (6,400 ft.), and Guinea Marshes Island at Little Monday Creek (15,800 ft.).

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Extensive marsh with 1,100 feet of fringe beach.
NEARSHORE: Intermediate at Jenkins Neck and at the northern one-fifth of the subsegment. Elsewhere, wide with tidal flats.

SHORELANDS USE
FASTLAND: Agricultural 45% (12.1 mi.), unmanaged, wooded 40% (10.7 mi.), and residential 15% (4.0 mi.).
SHORE: Waterfowl hunting.
NEARSHORE: Commercial and sport fishing, and shellfishing.

WIND AND SEA EXPOSURE: The shoreline in this subsegment trends NNW to SSE. Fetches at Bush Point are ESE - unlimited across the Chesapeake Bay, E - 3.4 miles, N - 4.5 miles, and SE - 1.6 miles. Except where offshore islands protect the mainland, there are unlimited fetches from the east, across the Chesapeake Bay, in almost the entire subsegment. Fetches at Hog Island are E - unlimited, SE - unlimited, SSE - 4.2 miles, and SSW - 1.9 miles.

OWNERSHIP: Private.

FLOOD HAZARD: High, critical. This is a low marsh area, most residences are located below the 5-foot contour. With the exposure of this subsegment to the Chesapeake Bay, the flood hazard is very high.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: Poor. The only beaches are those narrow, fringe beaches in front of some parts of the marshes.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Erosion ranges from slight or none to moderate, critical and noncritical, to severe, noncritical. The area on Jenkins Neck at the end of Route 646 has moderate, critical (1.1 fr/yr.) erosion. There is severe, noncritical erosion at the marsh beginning at the east mouth of John West Creek and extending south 3,400 feet. Historically, erosion here has been 4.4 feet per year.
ENDANGERED STRUCTURES: Several residences on Jenkins Neck at the end of Route 646 are endangered.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: Bulkheading with an overwash stone apron would halt the erosion at the endangered sites.

OTHER SHORE STRUCTURES: There are three piers on Jenkins Neck, at the end of Route 646, and three piers on Browns Bay, 2,000 feet west of the mouth of Blevins Creek.

POTENTIAL USE ENHANCEMENT: Low. The lowness of the land makes residential development hazardous, and its lack of suitable beaches prohibits any recreational development.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), NEW POINT COMFORT Quadr., 1964.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 150ct73 GL-4A/1-10;
06Nov73 GL-4A/316-328.

SEVERN RIVER, GLOUCESTER COUNTY, VIRGINIA
SUBSEGMENT 4B
(Maps 6A, 6B, 6C, 7A, 7B, 7C, and 8A, 8B, 8C)

EXTENT: 342,200 feet (64.8 mi.) of shoreline from the mouth of the Severn River extending to a point half-way between Ware River Point and Windmill Point, on the Mobjack Bay. Including the numerous creeks flowing into the Severn River.

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Fringe marsh 79% (51.2 mi.), beach 9% (5.9 mi.), embayed marsh 8% (4.9 mi.), extensive marsh 3% (2.0 mi.), and artificially stabilized 1% (0.8 mi.).
NEARSHORE: Narrow along the Severn River, intermediate along the Mobjack Bay.

SHORELANDS USE
FASTLAND: Agricultural 40% (25.9 mi.), unmanaged, wooded 40% (25.9 mi.), residential 15% (9.7 mi.), commercial 3% (1.9 mi.), and recreational 2% (1.4 mi.).
SHORE: Waterfowl hunting.
NEARSHORE: Commercial and sport fishing, shellfishing, and water sports.

WIND AND SEA EXPOSURE: The shoreline trend is NW to SE on the Mobjack Bay. The Severn River trends W to E with tributaries combining at Saddlers Neck from various directions. Fetches at Seven Cedar Point are ESE - unlimited across the Chesapeake Bay, E - 3.0 miles, NE - 2.6 miles, and SE - unlimited across the Bay. Fetches at Long Creek marsh at the beginning of the subsegment are N - 3.3 miles, WNW - 1.7 miles, and NE - 2.8 miles. At Ware River Point, fetches are SE - unlimited across the Bay, E - 2.9 miles, NE - 1.9 miles, N - 2.3 miles, and NW - 2.0 miles. The fetch at Stump Point is E - 5.2 miles.

OWNERSHIP: Private.

FLOOD HAZARD: High, critical. This is a low area and many residences, especially on Saddlers Neck, are below the 5-foot contour.

WATER QUALITY: Unsatisfactory.

BEACH QUALITY: Poor. There is some narrow beach in front of Four Point Marsh, and fringe beach at Mud Point and northeast of Long Creek mouth.

PRESENT SHORE EROSION SITUATION

EROSION RATE: No data available for the Severn River. There is moderate, noncritical erosion from Turtle Neck Point, at the mouth of the Severn River, to the end of the subsegment. The rate varies from 1.0 to 2.3 feet per year in this area.

ENDANGERED STRUCTURES: None.

SHORE PROTECTIVE STRUCTURES: Bulkheading (about 4,000 ft.), located primarily on Saddlers Neck, combined with some groins in places. All structures are moderately effective except at Stump Point where bulkheading is ineffective.

Suggested Action: The bulkheading at Stump Point is incomplete and not properly constructed. However, in this area construction should be restricted. Other types of structures should be used for the retaining of fill to prevent additional damage to the marshes. Consideration should be given to the use of gabions in place of vertical wooden bulkheading.

OTHER SHORE STRUCTURES: There are numerous piers and boatramps in this subsegment.

POTENTIAL USE ENHANCEMENT: This area has become a prime area for residential development in the past few years. There are several serious considerations which should be outlined in light of this developmental pressure.

Of primary importance is the high flood hazard which exists for all of the immediate waterfront fastland and, in several instances, for major portions of the necks. Robins Neck, Saddlers Neck, and the Cod Point area are particularly low and susceptible to storm-induced flooding. Therefore, owners should be aware that housing which develops below the 5-foot contour in these areas have a high probability of being flooded.

With the increased development has come a growing pressure to use the shore and nearshore areas for recreational purposes. This has resulted in the construction of numerous dredged boatslips and the bulkheading of the shore with resultant filling of the marsh. This practice should be stopped. Marsh areas have many beneficial effects on the shorelands. Besides being a valuable ecological asset, marshes play an important part in flood protection. The sponge-like ability of marshes to absorb water, especially extensive marshes, does much to protect nearby residences in the event of a large storm-induced flood. The marsh is also a valuable erosion control agent. This is particularly true of the interior marshes both embayed and fringe. Filling these areas exposes the fastland to the direct forces of erosive agents and flood waters.

In several instances the material used to backfill a bulkhead and cover the existing marsh was dredged from immediately in front of the bulkhead. This is an unacceptable practice for several reasons. First, the fill is used to cover an extremely valuable natural resource, the marsh. Second, the resultant dredged hole leads to deterioration of the nearshore waters. These deep holes act as traps for sediment and biologic detritus. This produces an anaerobic environment which does not allow the growth of organisms and which can be very odoriferous at low tide. Third, this practice can also lead to a quick deterioration of the retaining structure. The supportive material for toe protection of the retaining wall is not adequate, resulting in bulkhead collapse.

The increase in developmental pressures and water sports activities will lead to more boats and the need for more service facilities to support them. Therefore, instead of providing individual facilities for each residence by dredged canals and channels, a properly designed and accessed marina with fastland boat storage should be implemented. Studies have shown that this type of marina is less environmentally damaging, provides quicker transfer time from storage to water and is less expensive than in-water storage.

If water access is necessary from a property, piers should be constructed to deep water rather than dredging a channel.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 06Nov73 GL-4B/329-437;
07Dec73 GL-4B/446-452.

WARE RIVER, GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 5A (Maps 8A, 8B, 8C, and 9A, 9B, 9C)

EXTENT: 172,400 feet (32.7 mi.) of shoreline on the Ware River, including Wilson Creek.

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Fringe marsh 88% (28.8 mi.), embayed marsh 8% (2.5 mi.), and artificially stabilized marsh 4% (1.4 mi.)
NEARSHORE: Narrow from Jarvis Point to Ware Neck Point and off Roanes Wharf. East of the mouth of Wilson Creek is intermediate.
CREEK: Wilson Creek and the upper portions of the Ware River are broad, shallow, dendritic pattern, tidal creeks.

SHORELANDS USE
FASTLAND: Unmanaged, wooded 50% (16.3 mi.), agricultural 40% (13.1 mi.), and residential 10% (3.3 mi.).
SHORE: Waterfowl hunting.
NEARSHORE: Commercial and sport fishing, water sports, and shellfishing.

WIND AND SEA EXPOSURE: The shoreline trend is N to S. The fetch at Jarvis Point is SE - unlimited across the Chesapeake Bay. Fetches at Windmill Point are E - 3.4 miles, SE - 6.0 miles.

OWNERSHIP: Private.

FLOOD HAZARD: High, noncritical along the mouth of the Ware River. Moderate, noncritical along the Ware River, except at Jarvis Point and at Baileys, where it is high, critical.

WATER QUALITY: Satisfactory.

BEACH QUALITY: Poor. The only beach is a narrow, fringe beach between Jarvis Point and Ware Neck Point.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change to severe, noncritical. The erosion rate varies throughout the subsegment, the majority of it being either slight or moderate, noncritical. Of particular note is Ware Neck, whose western shore experiences moderate to severe erosion, ranging from 1.4 feet per year to 3.3 feet per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: There is 7,400 feet of bulkheading, some with groins. Most structures are moderately effective to effective.

Suggested Action: Very few areas within this subsegment are experiencing severe erosion. Many erosion sites, now bulkheaded, could have been remedied through an intensive marsh grass planting program.

Water access should be provided through the construction of piers to deep water instead of dredging canals or boat basins into the fastland.

OTHER SHORE STRUCTURES: Piers and landings.

POTENTIAL USE ENHANCEMENT: Additional development of housing within the subsegment should be restricted to the higher fastland. Housing should be constructed in a location which does not infringe upon the existing marshes.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), WARE NECK Quadr., 1965.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 06Nov73 GL-5A/438-445;
07Dec73 GL-5A/453-507.

NORTH RIVER, GLOUCESTER COUNTY, VIRGINIA

SUBSEGMENT 5B (Maps 9A, 9B, 9C, and 10A, 10B, 10C)

EXTENT: 150,000 feet (28.4 mi.) of shoreline from the tip of Ware Neck to the headwaters of the North River.

SHORELANDS TYPE
FASTLAND: Entirely low shore.
SHORE: Fringe marsh 88% (25.1 mi.), embayed marsh 7% (2.1 mi.), and artificially stabilized 4% (1.2 mi.).
RIVER: Intermediate to Lone Point, narrow from Lone Point to Belleville Creek. Shallow from there to the subsegment end at the headwaters of the North River.

SHORELANDS USE
FASTLAND: Agricultural 50% (14.2 mi.), unmanaged, wooded 47% (13.3 mi.), and residential 3% (0.9 mi.).
SHORE: Private access for water related activities such as fishing, swimming, and boating and private recreation on sections of the beach.
RIVER: Water sports, sportfishing, and commercial shellfishing.

WIND AND SEA EXPOSURE: The shoreline trend is N to S, with two 90° bends in the river. Fetches at Ware Neck Point are SE - unlimited, N - 3.2 miles, E - 3.6 miles, and S - 2.1 miles. The fetch at Elmington is ESE - 3.2 miles.

OWNERSHIP: Private.

FLOOD HAZARD: High, critical along the eastern front of Ware Neck, as many residences here are below the 5-foot contour. Elsewhere in the subsegment it is moderate, noncritical.

WATER QUALITY: Intermediate.

BEACH QUALITY: There are no beaches in this subsegment.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or none to moderate, noncritical. There are several areas of moderate erosion (1.1 ft/yr.) around Silver Creek, and between Belleville Creek and Back Creek.
ENDANGERED STRUCTURES: None.

SHORE PROTECTIVE STRUCTURES: Bulkheading, several thousand feet with groins, and some riprapping. All structures appear effective in protecting the shoreline.

Suggested Action: For those persons desiring access to the water, piers to deep water should be employed rather than dredged channels to shorefront. In several areas, landowners have removed portions of the protective fringe marsh. This practice is illegal and should be stopped as it leads to deterioration of the remaining marsh. It also reduces the erosion buffer and flood absorbent abilities of the marsh as well as reduces the marsh's input into the ecosystem.

OTHER SHORE STRUCTURES: There are numerous piers along the shoreline of this subsegment.

POTENTIAL USE ENHANCEMENT: Additional development of housing within the subsegment should be restricted to the higher fastland. The marshes should be preserved due to their valuable ecological assets and their flood protection and erosion control abilities.

MAPS: USGS, 7.5 Min.Ser. (Topo.), ACHILLES Quadr., 1965.
USGS, 7.5 Min.Ser. (Topo.), WARE NECK Quadr., 1965.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 07Dec73 GL-5B/544-552.

PIANKATANK RIVER,

GLOUCESTER COUNTY, VIRGINIA

SEGMENT 6 (Maps 11A, 11B, 11C, and 12A, 12B, 12C)

EXTENT: 152,000 feet (28.8 mi.) of shoreline along the Piankatank River and its creeks.

SHORELANDS TYPE
FASTLAND: Low shore 84% (24.1 mi.), low shore with bluff 2% (0.6 mi.), and moderately low shore with bluff 14% (4.1 mi.).
SHORE: Fringe marsh 83% (24.1 mi.), embayed marsh 12% (3.4 mi.), beach 4% (1.1 mi.), and artificially stabilized 1% (0.2 mi.).
RIVER: Narrow from the segment start to Cooper Point, from there the river becomes shallow, averaging 6-foot depths to Anderson Point, then 4-foot or less to the segment end.

SHORELANDS USE
FASTLAND: Agricultural 47% (13.5 mi.), unmanaged, wooded 41% (11.8 mi.), residential 10% (2.9 mi.), and recreational 2% (0.6 mi.).
SHORE: Private recreation.
RIVER: Watersports, sport fishing, and commercial shellfishing.

WIND AND SEA EXPOSURE: The shoreline trends NW to SE. The fetch at the segment start is NW - 3.2 miles. The fetch at Blands Wharf is NW - 1.5 miles.

OWNERSHIP: Private.

FLOOD HAZARD: Moderate, critical from the segment's beginning to Blands Wharf. Many residences here are below the 5-foot contour. From Blands Wharf to the headwaters of the Piankatank River, the flood hazard is low, noncritical.

WATER QUALITY: Satisfactory.

BEACH QUALITY: Poor. Any beach that does exist is narrow, fringe beach.

PRESENT SHORE EROSION SITUATION
EROSION RATE: Slight or no change, except for isolated points between French Creek and Ferry Creek, where it is moderate, noncritical (1.1 ft/yr.).
ENDANGERED STRUCTURES: None.

SHORE PROTECTIVE STRUCTURES: There is some effective bulkheading southeast of Anderson Point.

Suggested Action: Encourage fringe marsh growth. Bulkheads should be built behind the fringe marsh to prevent covering the natural, protective, marsh barrier.

OTHER SHORE STRUCTURES: There are numerous piers and several boat sheds.

POTENTIAL USE ENHANCEMENT: Marshes should be left in their natural state. The higher ground properties can be developed. However, reduction of cliff slope would greatly improve dra drainage and reduce rain induced, run-off erosion.

MAPS: USGS, 7.5 Min.Ser. (Topo.), WILTON, Quadr., 1964.
USGS, 7.5 Min.Ser. (Topo.), SALUDA, Quadr., 1965.
C&GS, #494, 1:40,000 scale, CHESAPEAKE BAY, Mobjack Bay and York River Entrance, 1971.

PHOTOS: Aerial-VIMS 10Sep73 GL-6/91-111.

MAP 2A

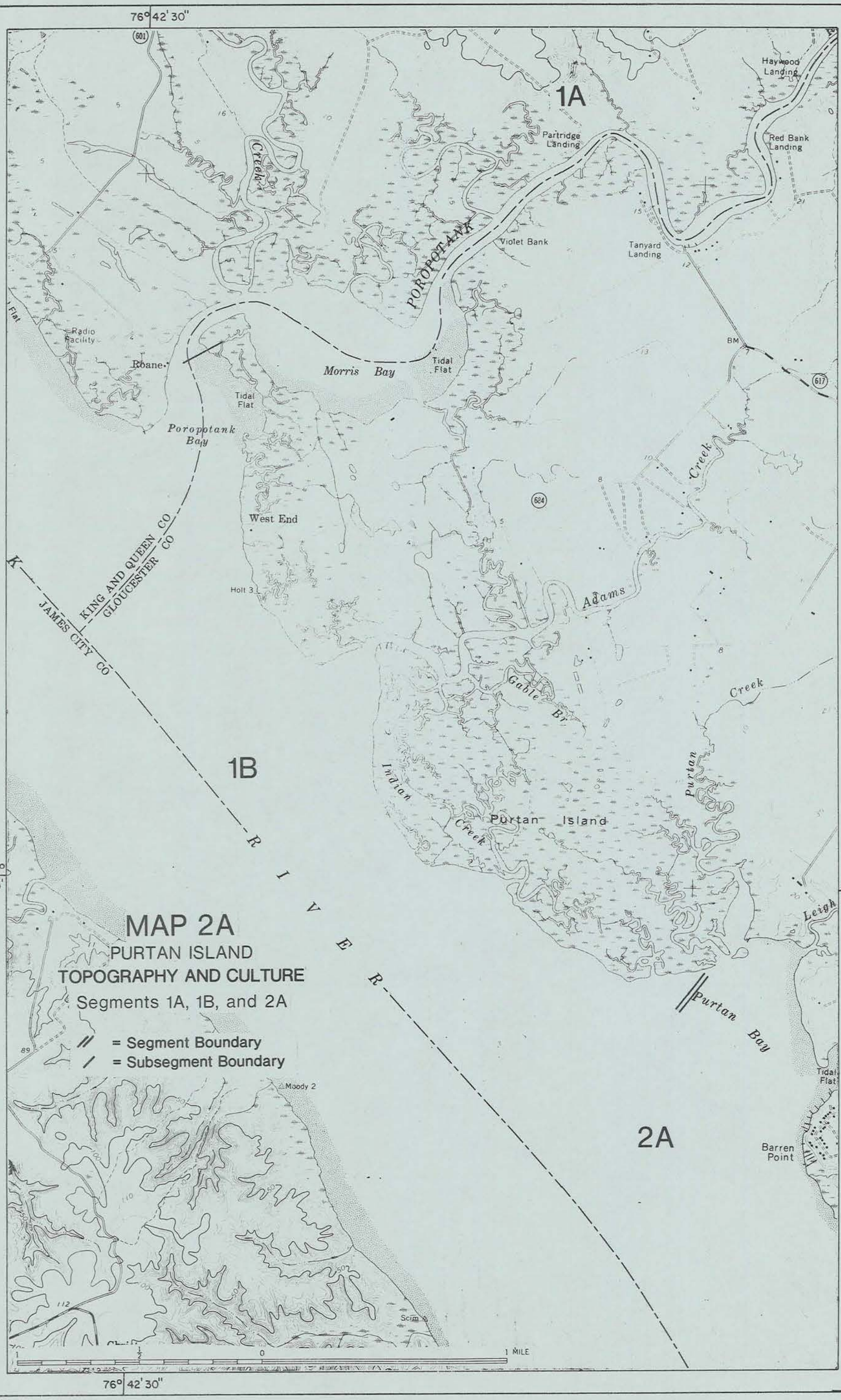
PURTAN ISLAND

TOPOGRAPHY AND CULTURE

Segments 1A, 1B, and 2A

// = Segment Boundary

/ = Subsegment Boundary



76° 42' 30"

1A

1B

2A

MAP 2B

PURTAN ISLAND

SHORELANDS TYPES

Segments 1A, 1B, and 2A

FASTLAND

- Low Shore
- Moderately Low Shore

SHORE

- Beach
- Fringe Marsh
- Extensive Marsh
- Embayed Marsh

NEARSHORE

- Narrow
- Intermediate
- Wide

39° 25'

76° 42' 30"

1 MILE

MAP 2C

PURTAN ISLAND

FASTLAND USE, OWNERSHIP, EROSION

Segments 1A, 1B, and 2A

USE

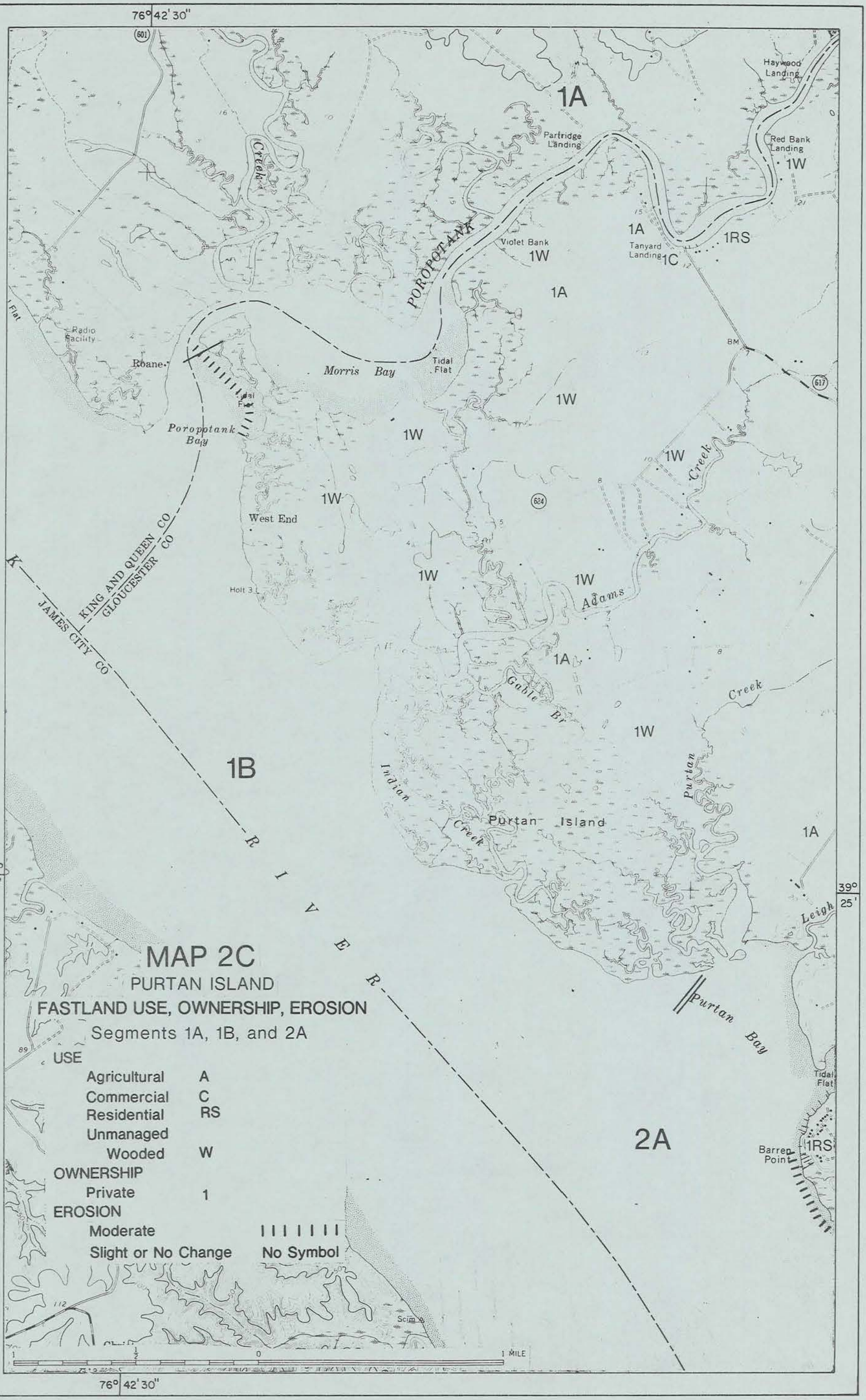
Agricultural	A
Commercial	C
Residential	RS
Unmanaged Wooded	W

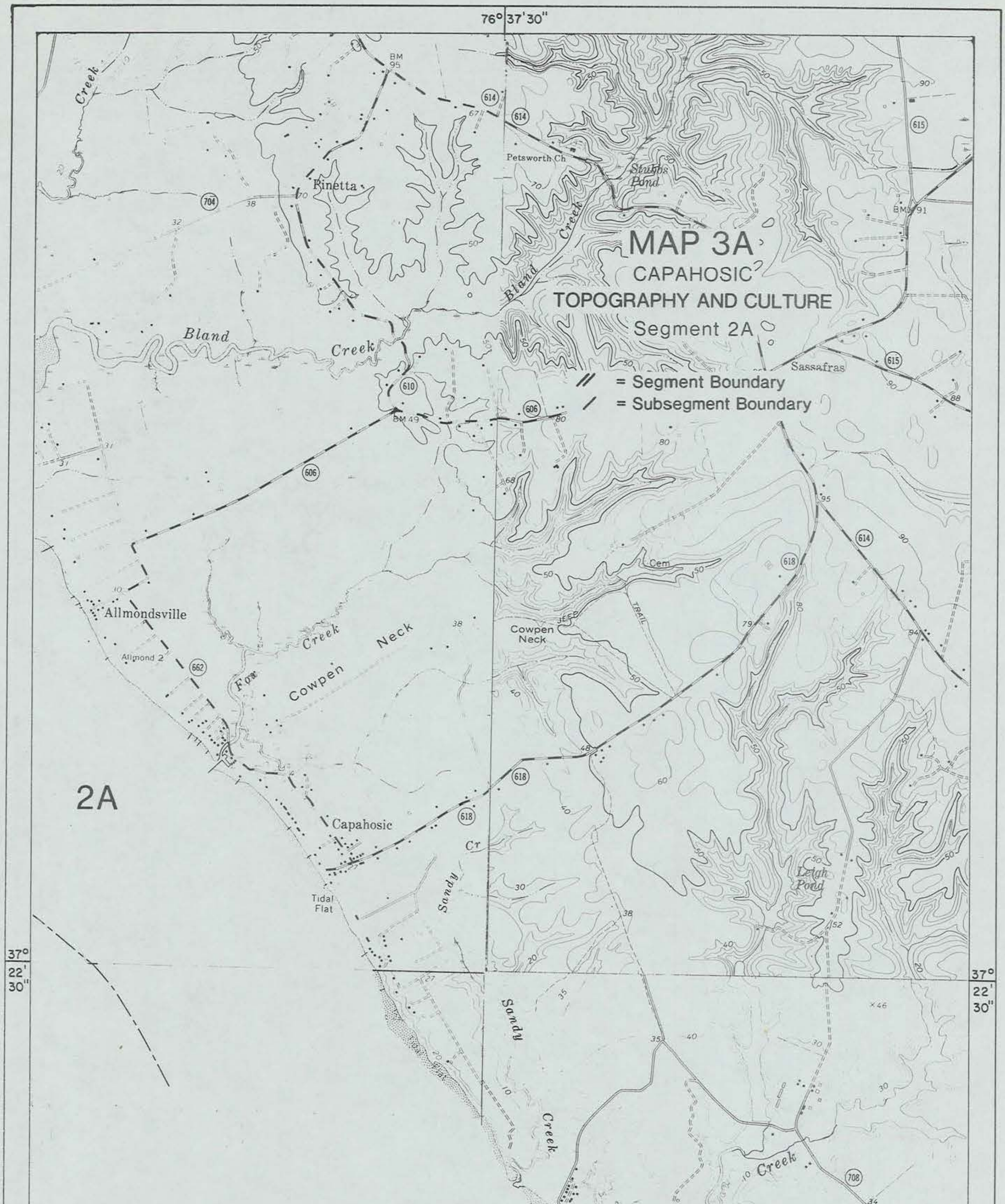
OWNERSHIP

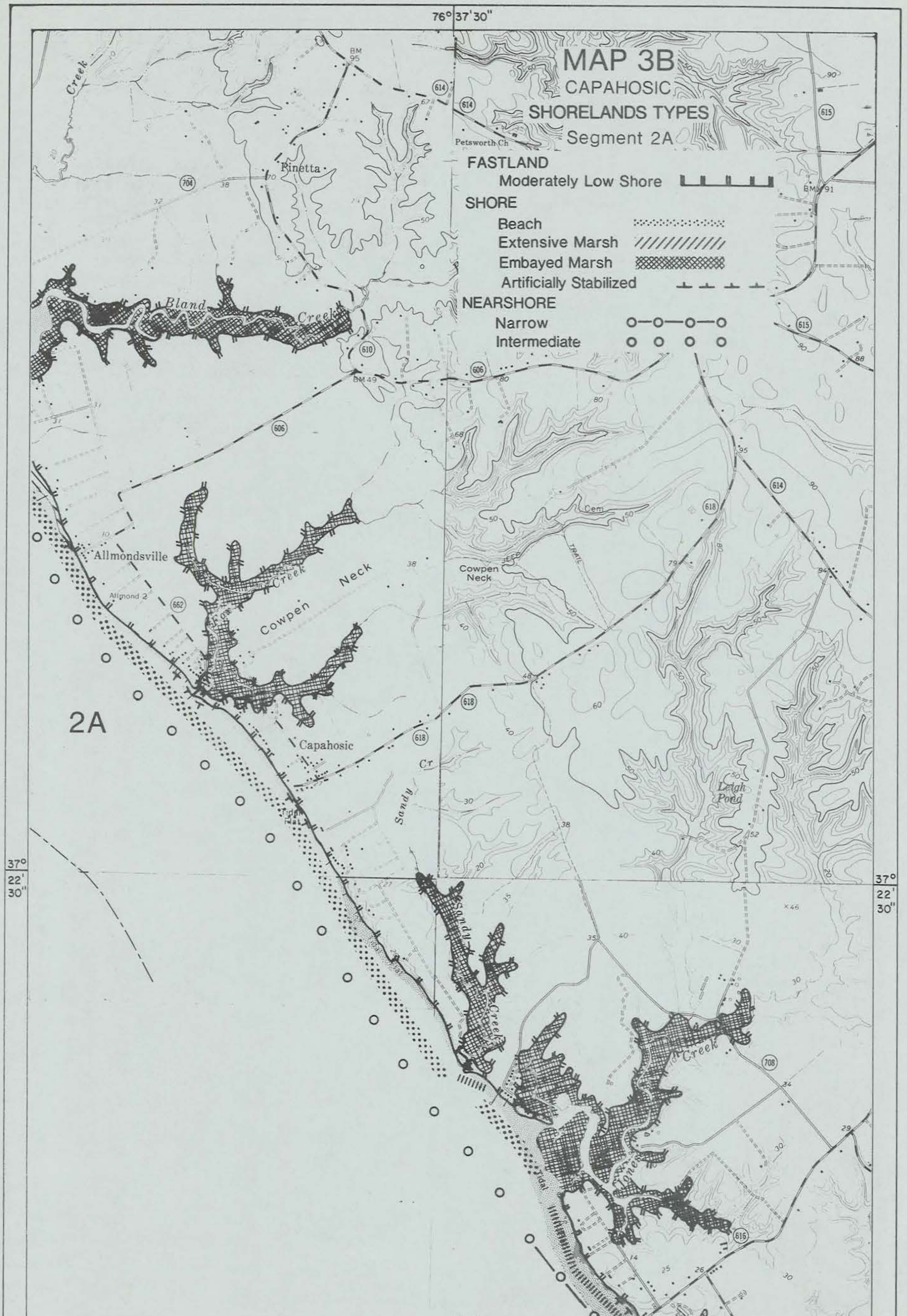
Private	1

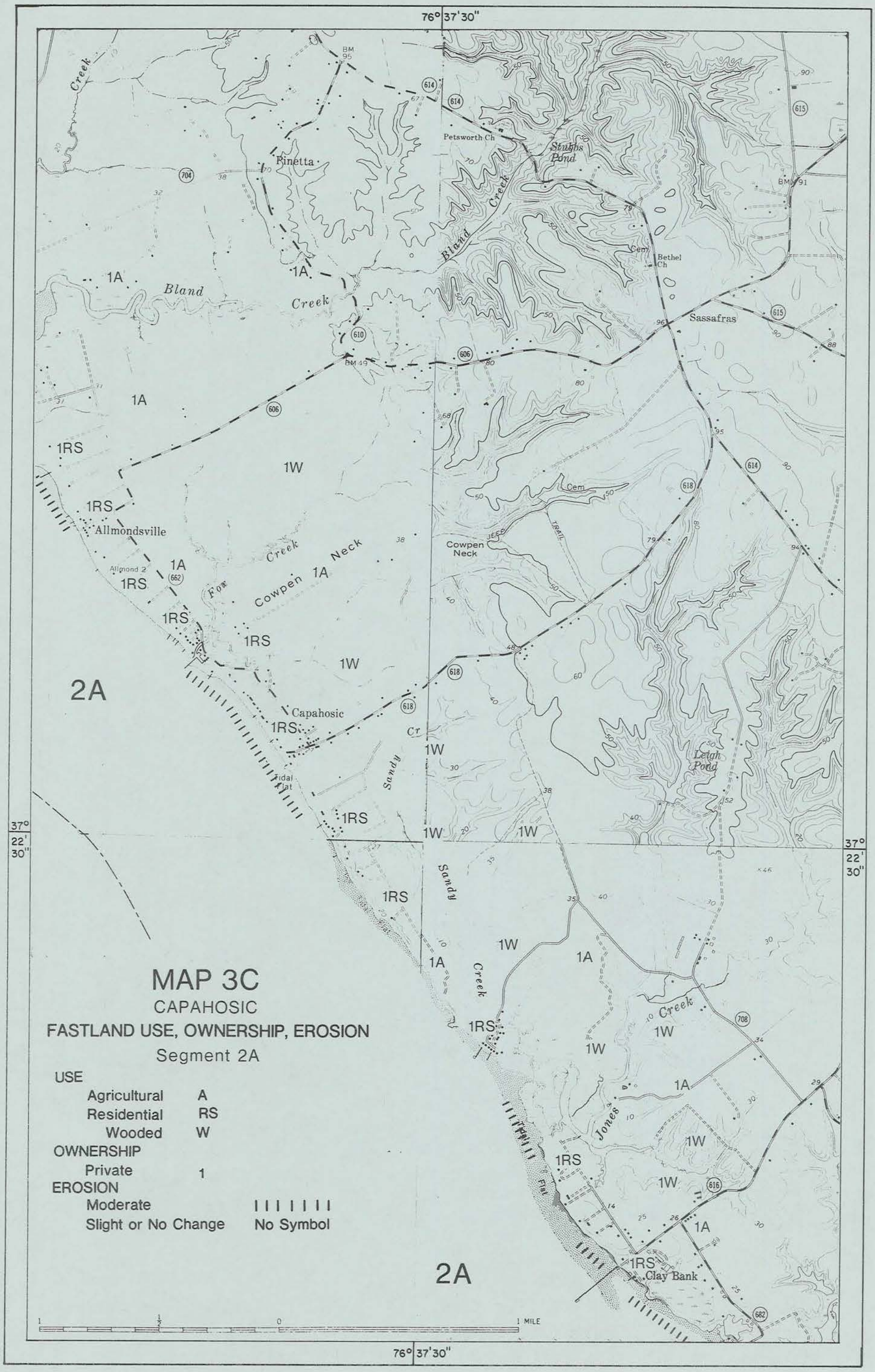
EROSION

Moderate	|||||||
Slight or No Change	No Symbol




MAP 3A
CAPAHOSIC
TOPOGRAPHY AND CULTURE
Segment 2A
// = Segment Boundary
/ = Subsegment Boundary
76° 37'30"
37° 22' 30"
2A
2A
Finetta
Petsworth Ch
Stubbs Pond
Bland Creek
Bland
Creek
Sassafras
Allmondsville
Almond 2
Fox Creek
Cowpen Neck
Cowpen Neck
Cem
JEEP TRAIL
Capahosic
Tidal Flat
Sandy Cr
Sandy Creek
Leigh Pond
Jones Creek
Tidal Flat
Clay Bank
1 MILE


MAP 3B
CAPAHOSIC
SHORELANDS TYPES
Segment 2A
FASTLAND
Moderately Low Shore
SHORE
Beach
Extensive Marsh
Embayed Marsh
Artificially Stabilized
NEARSHORE
Narrow
Intermediate
76° 37'30"
37° 22' 30"
2A
2A
Bland Creek
Petsworth Ch
Pinetta
Allmondsville
Cowpen Neck
Capahosic
Sandy Cr
Sandy Creek
Leigh Pond
Clay Bank
1 MILE



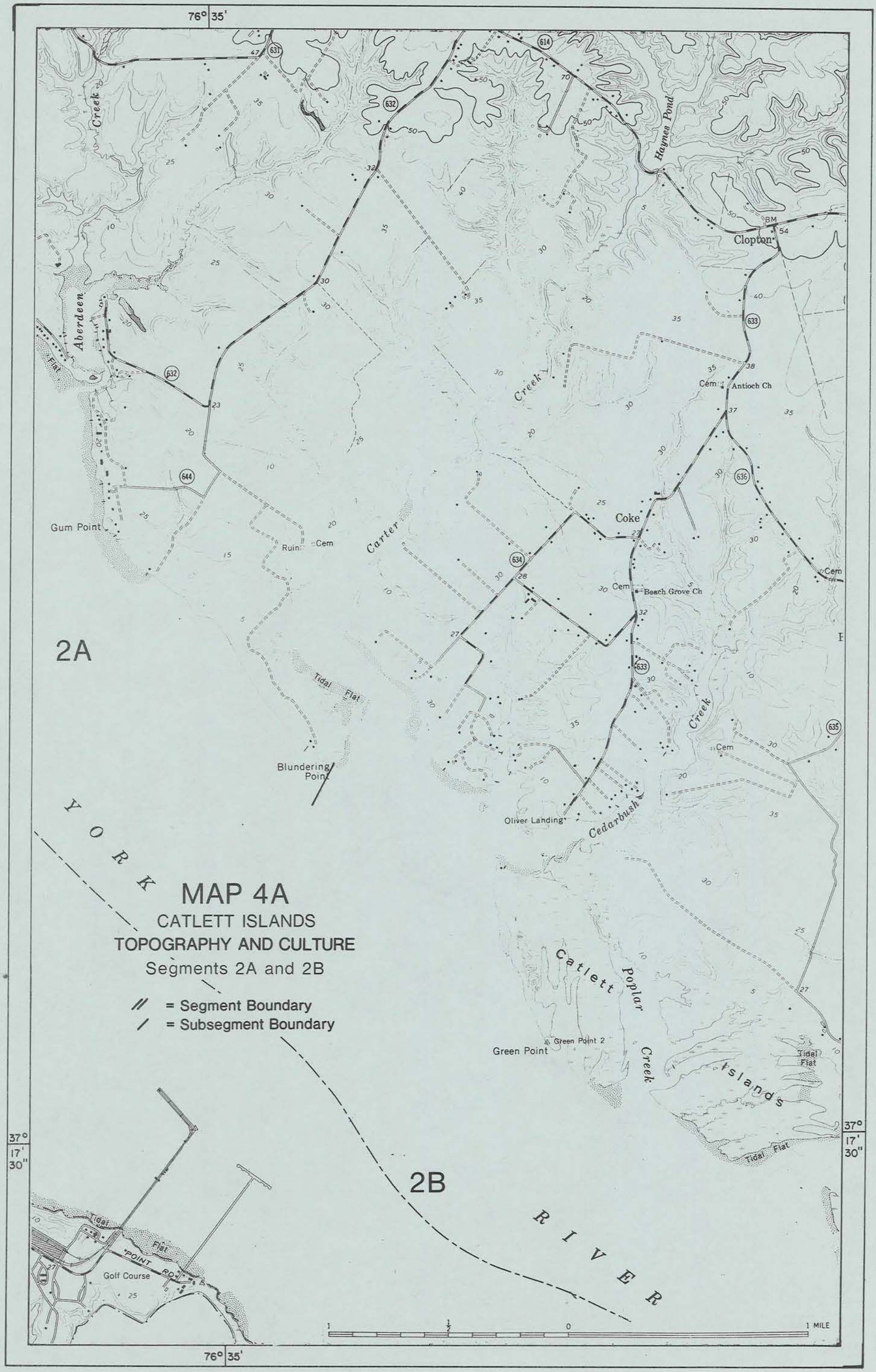
MAP 3C

CAPAHOSIC

FASTLAND USE, OWNERSHIP, EROSION

Segment 2A

USE	
Agricultural	A
Residential	RS
Wooded	W
OWNERSHIP	
Private	1
EROSION	
Moderate	|||||||
Slight or No Change	No Symbol


76° 35'
2A
Creek
Aberdeen
Flat
Gum Point
Ruin
Cem
Carter
Creek
Haynes Pond
BM
54
Clopton
Antioch Ch
Coke
Beach Grove Ch
Cem
Tidal Flat
Blundering Point
Oliver Landing
Cedarbush
Creek
Catlett Islands
Poplar Creek
Green Point 2
Green Point
Tidal Flat
Tidal Flat
YORK
RIVER
2B
MAP 4A
CATLETT ISLANDS
TOPOGRAPHY AND CULTURE
Segments 2A and 2B
// = Segment Boundary
/ = Subsegment Boundary
Golf Course
POINT RD
Tidal Flat
37° 17' 30"
76° 35'
1 MILE

76° 35'

MAP 4B

CATLETT ISLANDS

SHORELANDS TYPES

Segments 2A and 2B

FASTLAND
- Low Shore
- Moderately Low Shore

SHORE
- Beach
- Fringe Marsh
- Extensive Marsh
- Embayed Marsh
- Artificially Stabilized

NEARSHORE
- Intermediate
- Wide

2A

2B

Haynes Pond

Clopton

BM 54

Antioch Ch

Cem

Coke

Beach Grove Ch

Gum Point

Ruin

Cem

Tidal Flat

Blundering Point

Oliver Landing

Catlett Islands

Catlett Poplar Creek

Green Point

Green Point 2

Tidal Flat

Dunes

Tidal Flat

Tidal Flat

POINT RD

Golf Course

YORK RIVER

1 0 1 MILE

37° 17' 30"

76° 35'

76° 35'

MAP 4C

CATLETT ISLANDS

FASTLAND USE, OWNERSHIP, EROSION

Segments 2A and 2B

USE

Agricultural	A
Residential	RS
Unmanaged Wooded	W

OWNERSHIP

Private	1

EROSION

Moderate	
Slight or No Change	No Symbol

2A

2B

YORK RIVER

37° 17' 30"

76° 35'

1 MILE

MAP 5A

GLOUCESTER POINT

TOPOGRAPHY AND CULTURE

Segments 2B, 2C, 3A, and 3B

// = Segment Boundary

/ = Subsegment Boundary

76° 30'

37° 15'

2B

2C

3A

3B

GLOUCESTER CO
YORK CO

1 MILE

MAP 5B

GLOUCESTER POINT

SHORELANDS TYPES

Segments 2B, 2C, 3A, and 3B

FASTLAND

- Low Shore
- Moderately Low Shore
- Moderately Low Shore with Bluff

SHORE

- Beach
- Fringe Marsh
- Extensive Marsh
- Embayed Marsh
- Artificially Stabilized

NEARSHORE

- Narrow
- Intermediate
- Wide

76° 30'

37° 15'

2B

2C

3A

3B

GLOUCESTER CO
YORK CO

1 0 1 MILE

MAP 5C

GLOUCESTER POINT

FASTLAND USE, OWNERSHIP, EROSION

Segments 2B, 2C, 3A, and 3B

USE

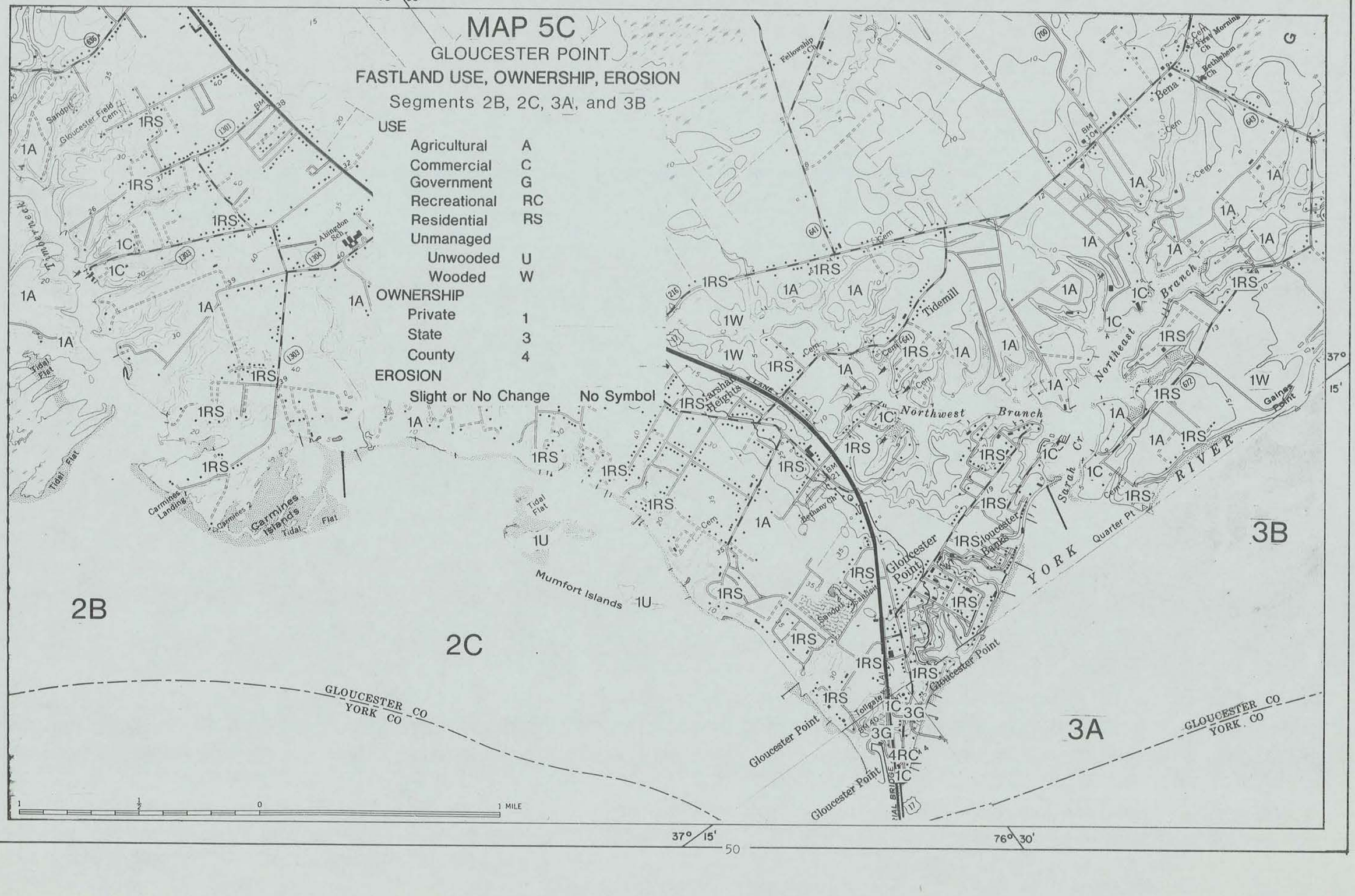
Agricultural	A
Commercial	C
Government	G
Recreational	RC
Residential	RS
Unmanaged	
Unwooded	U
Wooded	W

OWNERSHIP

Private	1
State	3
County	4

EROSION

Slight or No Change — No Symbol



MAP 6A

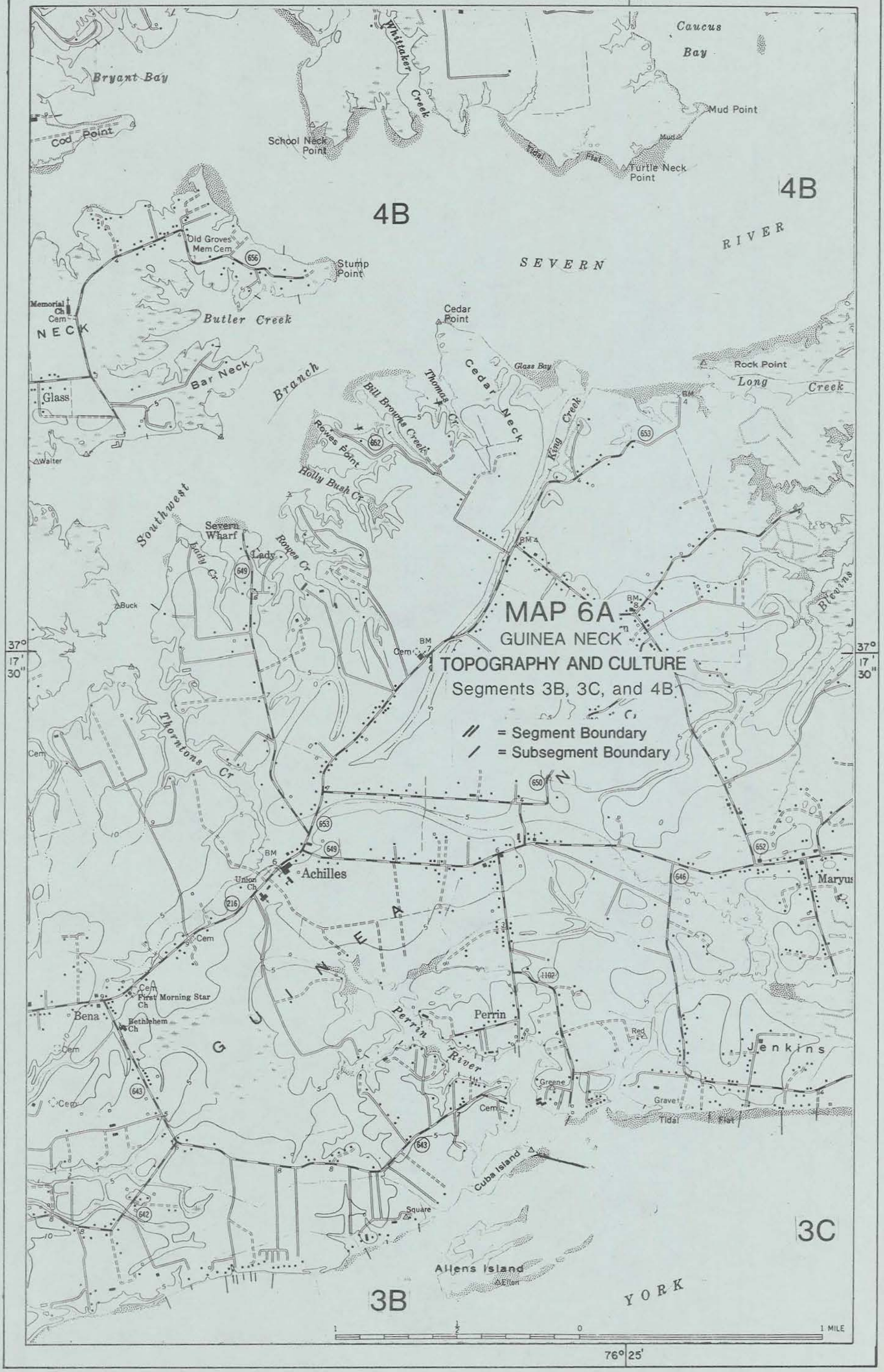
GUINEA NECK

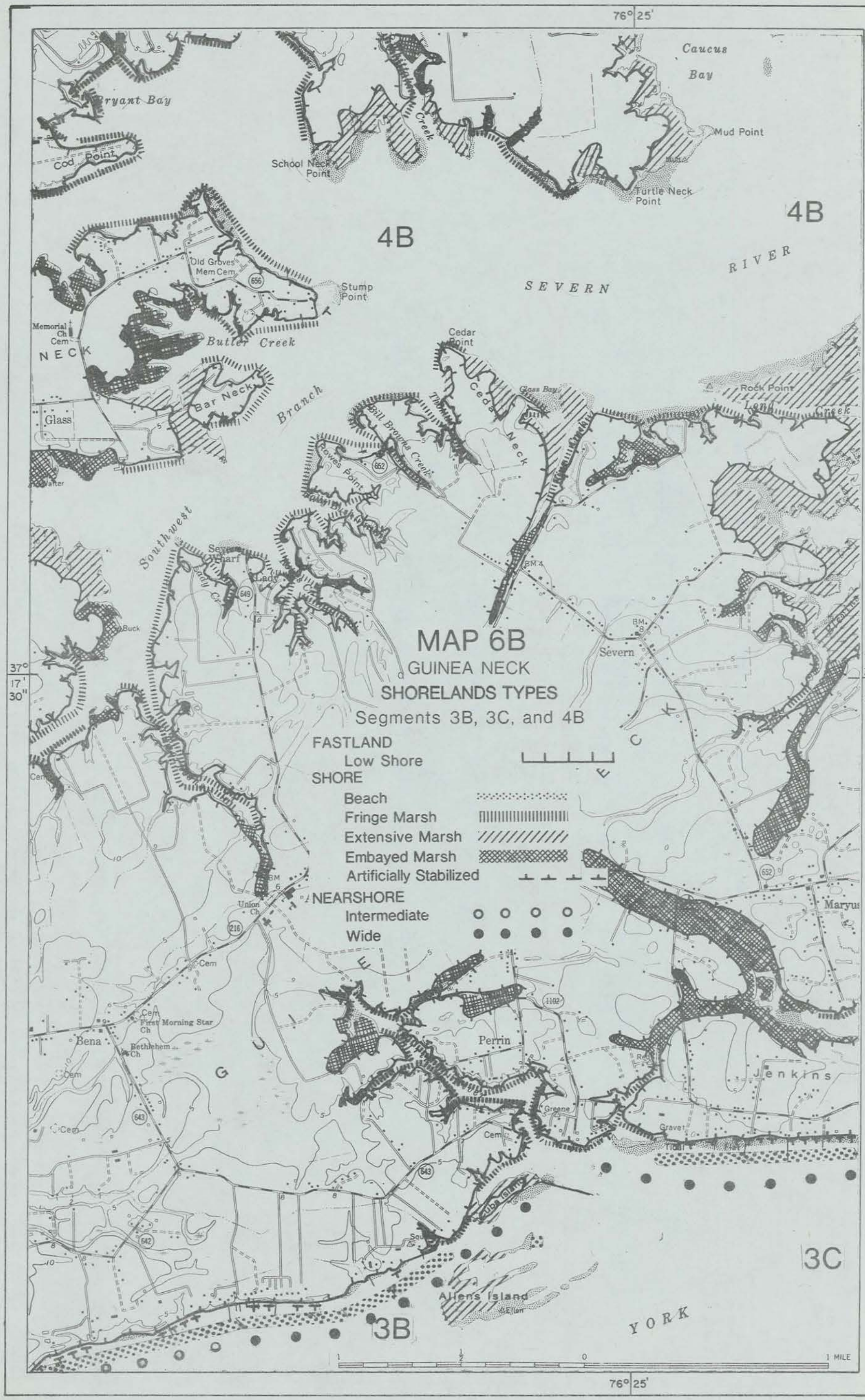
TOPOGRAPHY AND CULTURE

Segments 3B, 3C, and 4B

// = Segment Boundary

/ = Subsegment Boundary




76° 25'
Caucus Bay
Bryant Bay
Cod Point
School Neck Point
Mud Point
Turtle Neck Point
4B
4B
RIVER
SEVERN
Old Groves Mem Cem
656
Stump Point
Memorial Ch Cem
NECK
Butler Creek
Cedar Point
Bar Neck
Branch
Glass
Glass Bay
Rock Point
Long Creek
Bill Browns Creek
Cedar Neck
Rowes Point
652
Southwest
Severn Wharf
Lady Creek
649
BM 4
Buck
Severn
37° 17' 30"
MAP 6B
GUINEA NECK
SHORELANDS TYPES
Segments 3B, 3C, and 4B
FASTLAND
Low Shore
SHORE
Beach
Fringe Marsh
Extensive Marsh
Embayed Marsh
Artificially Stabilized
NEARSHORE
Intermediate
Wide
GUINEA CREEK
Union Ch
216
Cem
First Morning Star Ch
Bethlehem Ch
Bena
643
642
1102
Perrin
Greene
Gravel Hill
Jenkins
Cuba Island
Allens Island
3B
3C
YORK
1 0 1 MILE
76° 25'

MAP 6C

GUINEA NECK

FASTLAND USE, OWNERSHIP, EROSION

Segments 3B, 3C, and 4B

USE	
Agricultural	A
Commercial	C
Recreational	RC
Residential	RS
Unmanaged	
Unwooded	U
Wooded	W
OWNERSHIP	
Private	1
County	4
Town	5
City	5
EROSION	
Moderate	
Slight or No Change	No Symbol

76° 25'

37° 17' 30"

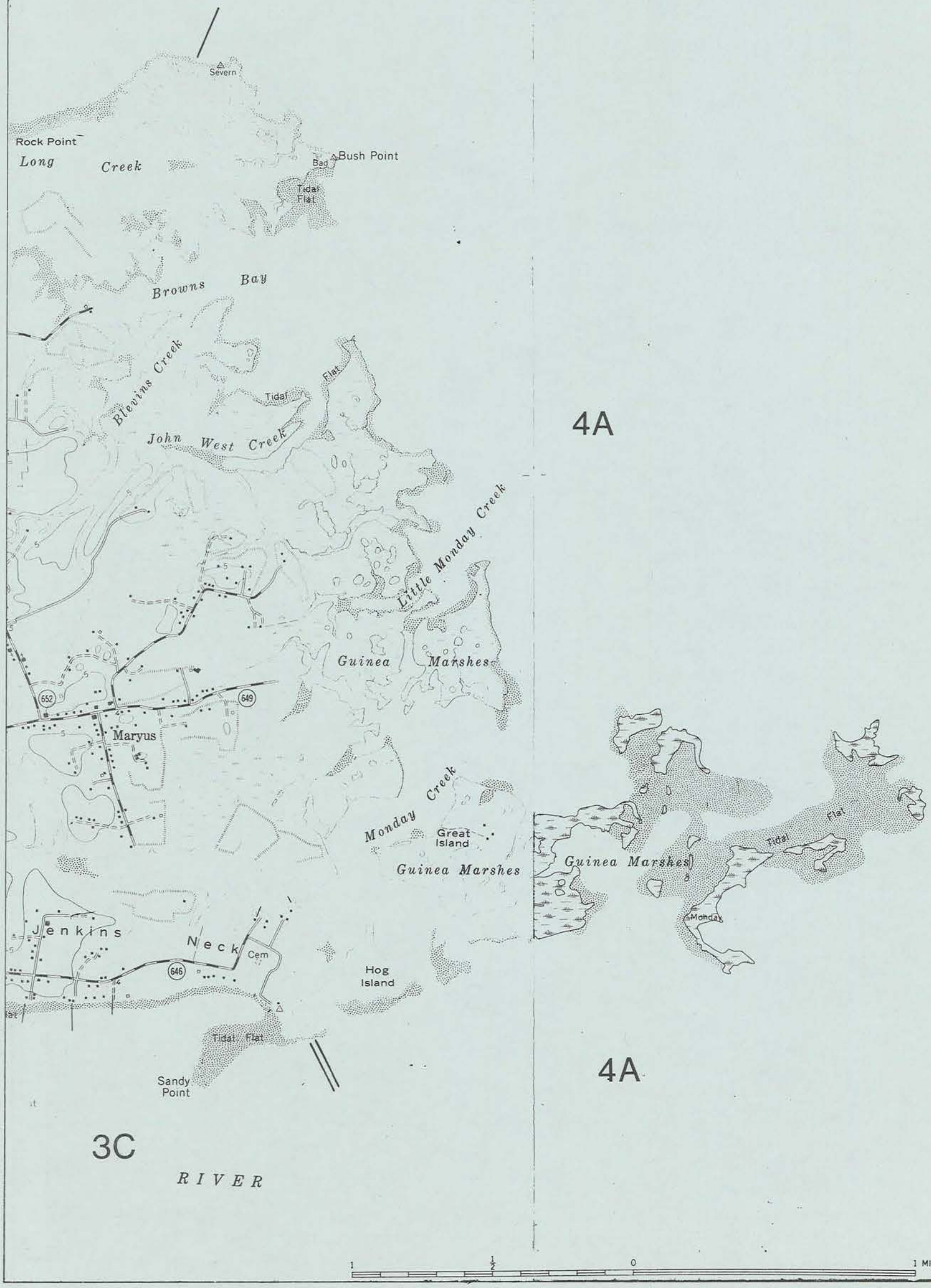
1 ½ 0 1 MILE

MAP 7A

GUINEA MARSHES

TOPOGRAPHY AND CULTURE

Segments 3C, 4A, and 4B



MAP 7B

GUINEA MARSHES

SHORELANDS TYPES

Segments 3C, 4A, and 4B

FASTLAND
- Low Shore

SHORE
- Beach
- Extensive Marsh
- Artificially Stabilized

NEARSHORE
- Intermediate
- Wide

MAP 7C

GUINEA MARSHES

FASTLAND USE, OWNERSHIP, EROSION

Segments 3C, 4A, and 4B

USE

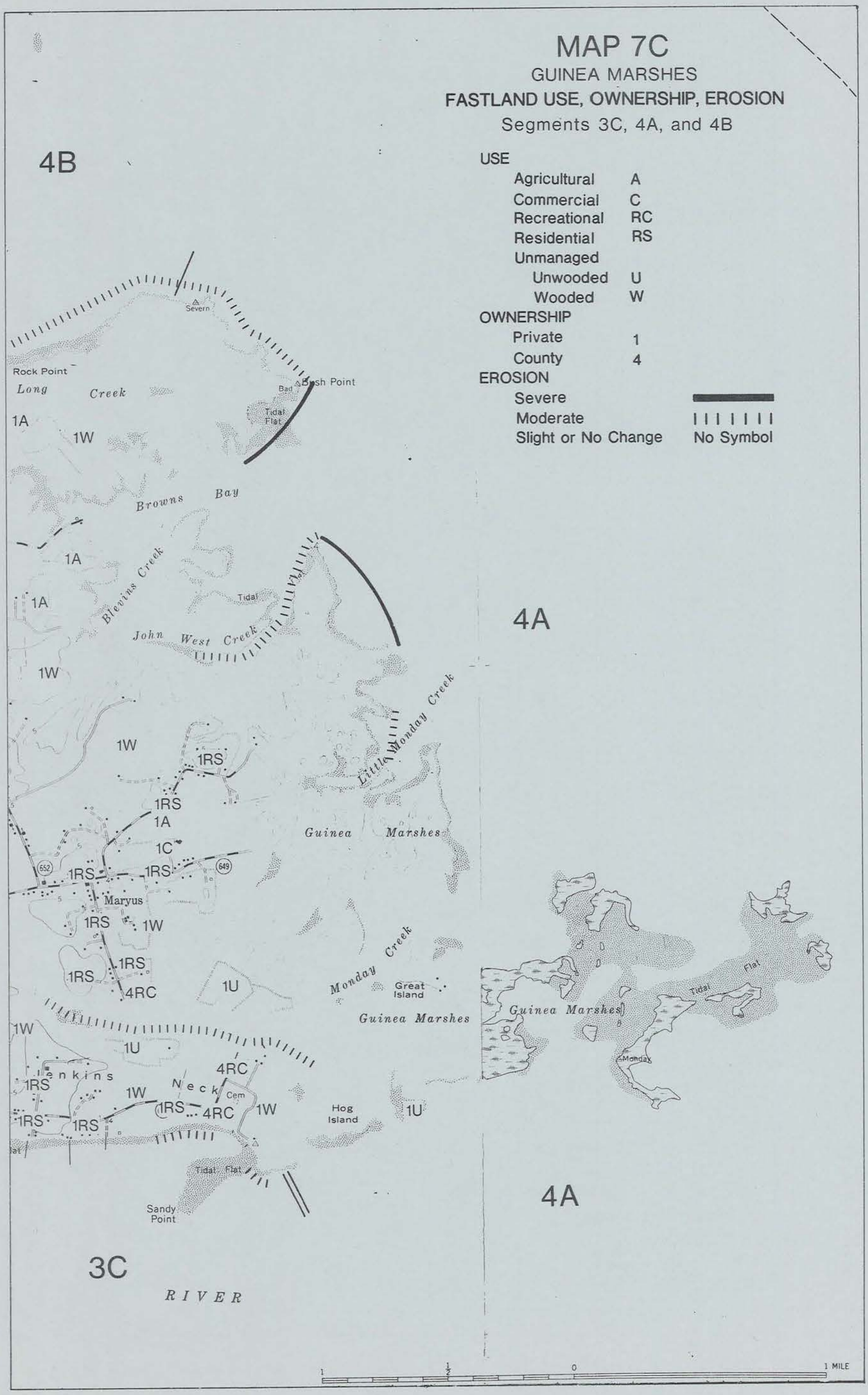
Agricultural	A
Commercial	C
Recreational	RC
Residential	RS
Unmanaged	
Unwooded	U
Wooded	W

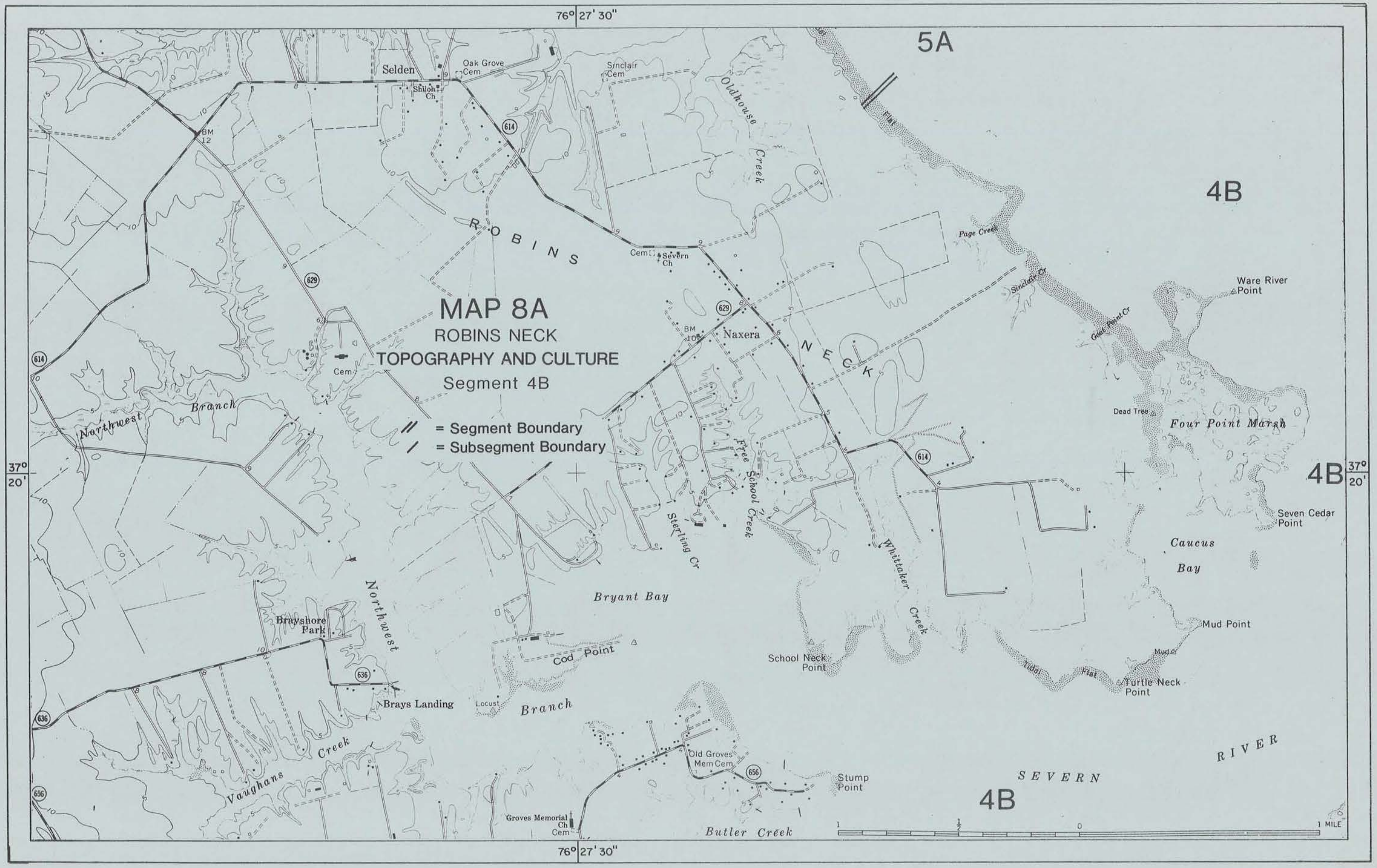
OWNERSHIP

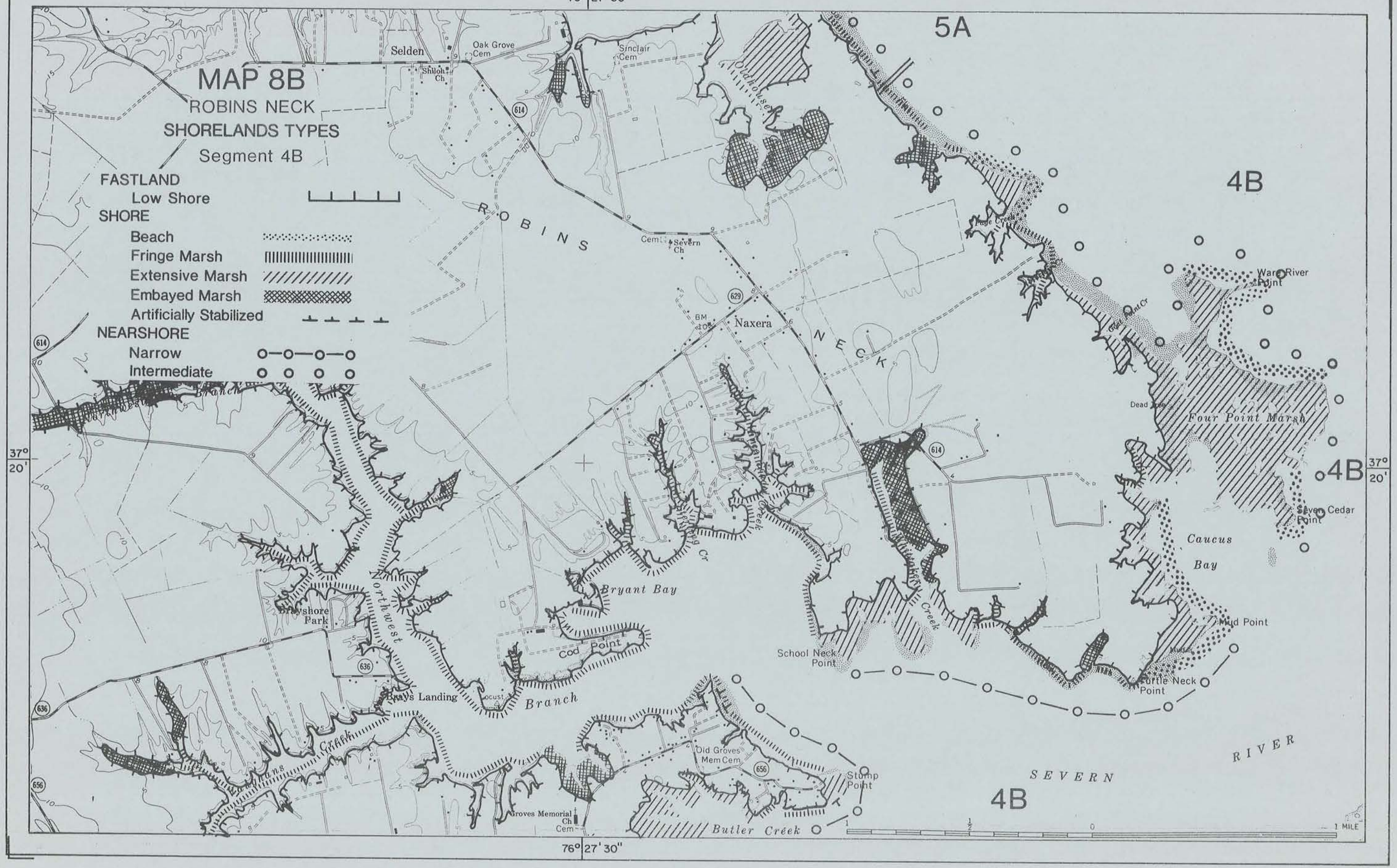
Private	1
County	4

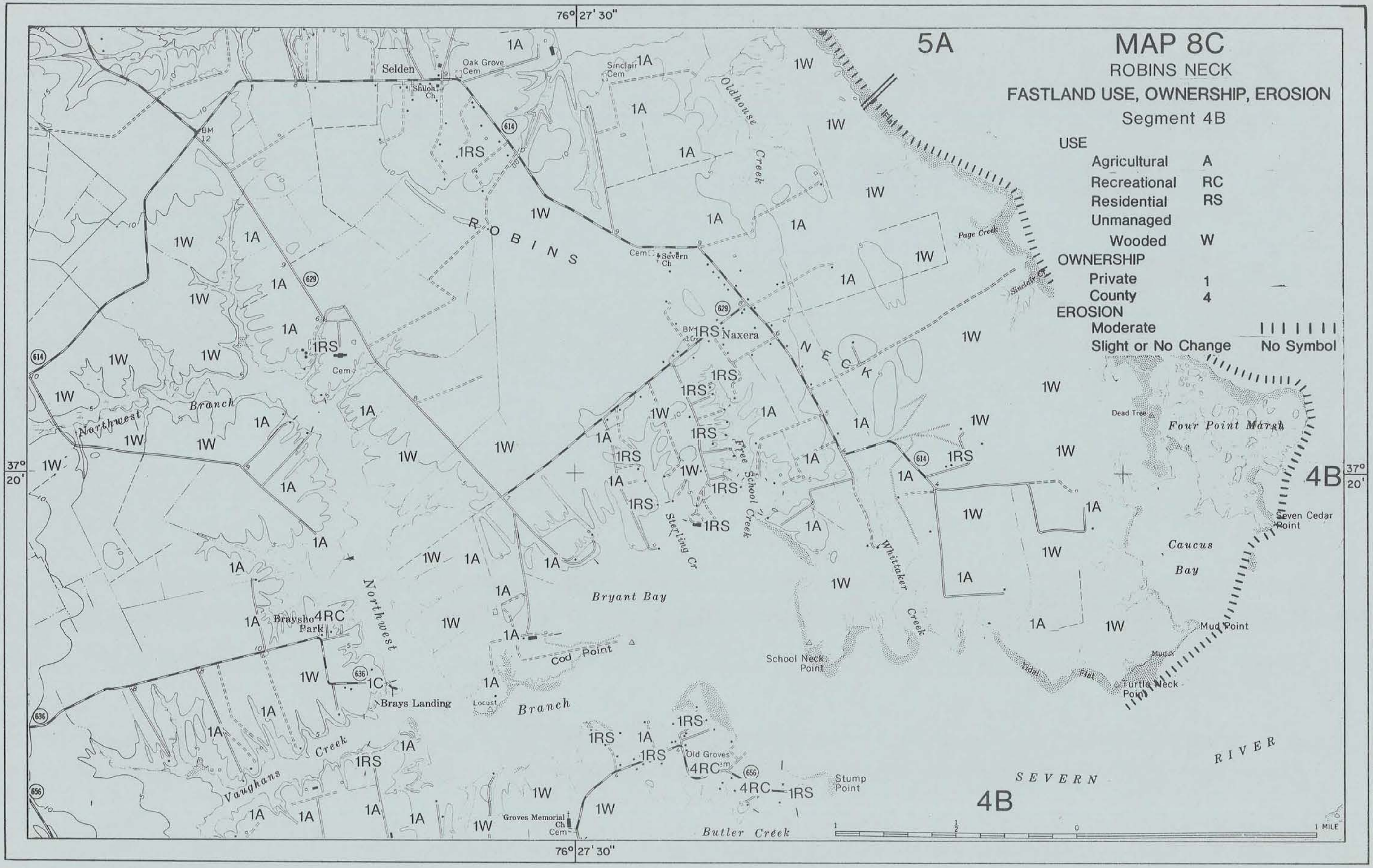
EROSION

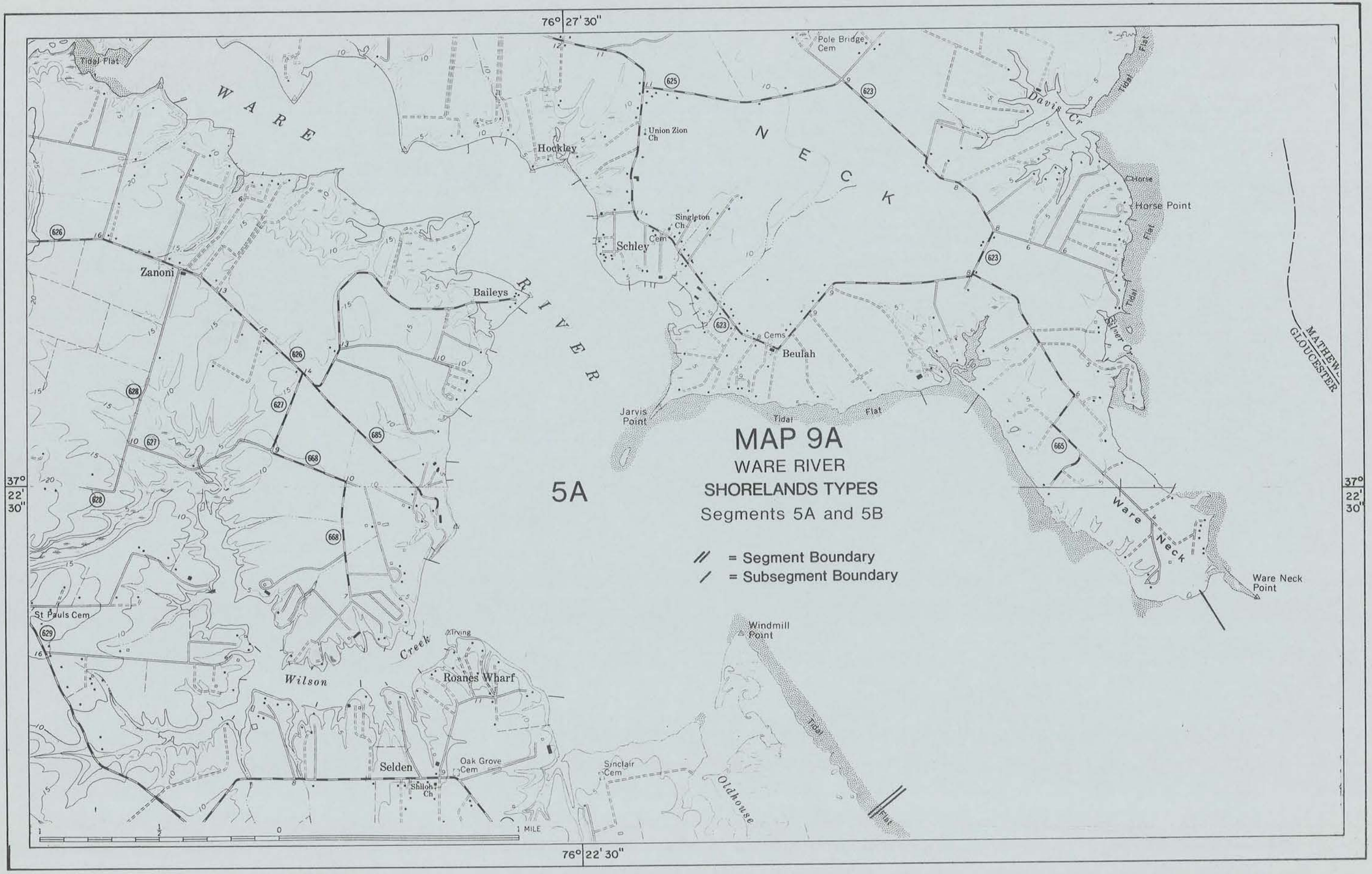
Severe	▬▬▬
Moderate	| | | | | |
Slight or No Change	No Symbol




MAP 8A
ROBINS NECK
TOPOGRAPHY AND CULTURE
Segment 4B
// = Segment Boundary
/ = Subsegment Boundary
76° 27' 30"
37° 20'
5A
4B
Selden
Oak Grove Cem
Shiloh Ch
Sinclair Cem
Oldhouse Creek
ROBINS NECK
Cem
Severn Ch
BM 12
BM 10
Naxera
Page Creek
Sinclair Cr
Goat Point Cr
Flat
Ware River Point
Dead Tree
Four Point Marsh
Seven Cedar Point
Caucus Bay
Mud Point
Mud
Turtle Neck Point
Tidal Flat
Northwest Branch
Northwest
Free School Creek
Sterling Cr
Whittaker Creek
Bryant Bay
Brayshore Park
Cod Point
Locust
Branch
Brays Landing
School Neck Point
Vaughans Creek
Old Groves Mem Cem
Stump Point
SEVERN RIVER
Groves Memorial Ch Cem
Butler Creek
1 MILE
614
629
636
656


76° 27' 30"
MAP 8B
ROBINS NECK
SHORELANDS TYPES
Segment 4B
FASTLAND
Low Shore
SHORE
Beach
Fringe Marsh
Extensive Marsh
Embayed Marsh
Artificially Stabilized
NEARSHORE
Narrow
Intermediate
5A
4B
Selden
Oak Grove Cem
Shiloh Ch
Sinclair Cem
ROBINS
NECK
Severn Ch
Naxera
BM
Ware River Point
Four Point Marsh
Seven Cedar Point
Caucus Bay
Mud Point
Turtle Neck Point
School Neck Point
Bryant Bay
Cod Point
Northwest Branch
Brayshore Park
Bray's Landing
Locust
Old Groves Mem Cem
Groves Memorial Ch Cem
Stump Point
Butler Creek
SEVERN RIVER
4B
1 MILE
37° 20'
614
629
636
656


MAP 8C
ROBINS NECK
FASTLAND USE, OWNERSHIP, EROSION
Segment 4B
USE
Agricultural A
Recreational RC
Residential RS
Unmanaged
Wooded W
OWNERSHIP
Private 1
County 4
EROSION
Moderate
Slight or No Change No Symbol
5A
4B
76° 27' 30"
37° 20'
ROBINS NECK
Selden
Oak Grove Cem
Shiloh Ch.
Sinclair Cem
Oldhouse Creek
Page Creek
Sinclair Cr
Cem
Severn Ch
Naxera
Northwest Branch
Free School Creek
Sterling Cr
Whittaker Creek
Dead Tree
Four Point Marsh
Seven Cedar Point
Caucus Bay
Mud Point
Turtle Neck Point
Tidal Flat
Bryant Bay
Cod Point
School Neck Point
Braysho Park
Brays Landing
Locust
Branch
Vaughans Creek
Old Groves
Stump Point
Groves Memorial Ch
Cem
Butler Creek
SEVERN RIVER
1 MILE


76° 27' 30"
Tidal Flat
WARE
RIVER
NECK
Hockley
Union Zion Ch
Pole Bridge Cem
Davis Cr
Tidal Flat
Horse
Horse Point
Flat
Singleton Ch
Cem
Schley
Zanoni
Baileys
Cems
Beulah
Tidal Flat
Jarvis Point
Silver Cr
MATHEW
GLOUCESTER
MAP 9A
WARE RIVER
SHORELANDS TYPES
Segments 5A and 5B
// = Segment Boundary
/ = Subsegment Boundary
5A
37° 22' 30"
Ware Neck
Ware Neck Point
St Pauls Cem
Irving
Wilson
Creek
Roanes Wharf
Windmill Point
Selden
Oak Grove Cem
Shiloh Ch
Sinclair Cem
Oldhouse
Tidal Flat
1 MILE
76° 22' 30"


76° 27' 30"
MAP 9B
WARE RIVER
SHORELANDS TYPES
Segments 5A and 5B
FASTLAND
Low Shore
Low Shore with Bluff
SHORE
Beach
Fringe Marsh
Extensive Marsh
Embayed Marsh
Artificially Stabilized
NEARSHORE
Narrow
Intermediate
5A
WARE RIVER
WARE NECK
MATHEWS GLOUCESTER
Pole Bridge Cem
Union Zion Ch
Singleton Ch
Schley
Cem
Baileys
Cems
Beulah
Jarvis Point
Tidal Flat
Horse Point
Flat
Ware Neck
Ware Neck Point
Windmill Point
St Pauls Cem
Wilson Creek
Roanes Wharf
Selden
Oak Grove Cem
Shiloh Ch
Sinclair Cem
Clarkens
1 MILE
37° 22' 30"
76° 22' 30"

76° 27' 30"

37° 22' 30"

MAP 9C

WARE RIVER

FASTLAND USE, OWNERSHIP, EROSION

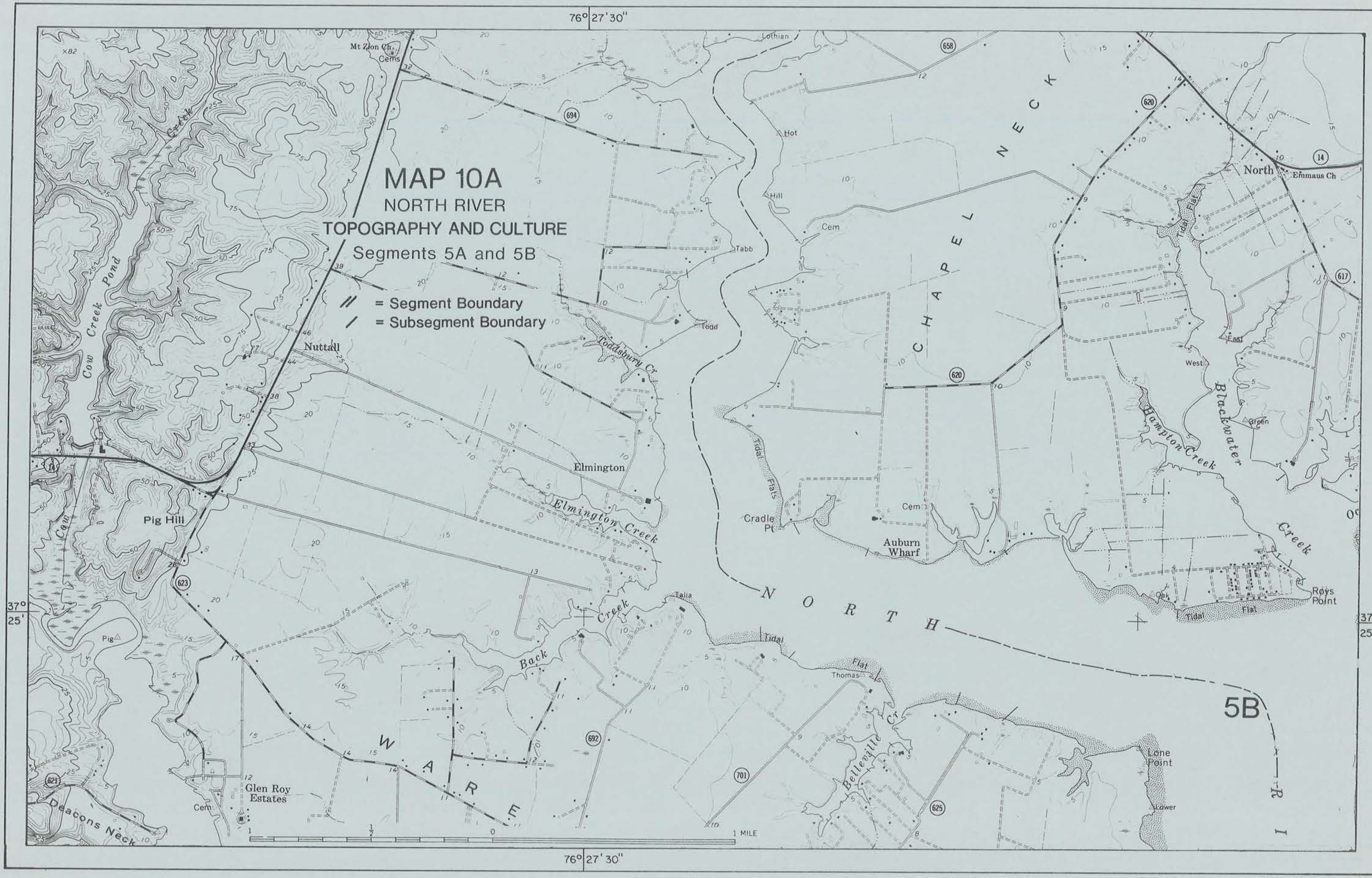
Segments 5A and 5B

5A

USE		
Agricultural	A	
Commercial	C	
Residential	RS	
Unmanaged Wooded	W	
OWNERSHIP		
Private	1	
EROSION		
Severe		
Moderate		
Slight or No Change		No Symbol

1 MILE

76° 22' 30"



MAP 10A
NORTH RIVER
TOPOGRAPHY AND CULTURE
Segments 5A and 5B
// = Segment Boundary
/ = Subsegment Boundary
76° 27' 30"
37° 25'
Mt Zion Ch
Cems
Lothian
Hot
Hill
Cem
Tabb
Todd
Toddsbury Cr
CHAPEL NECK
North
Emmaus Ch
Tidal Flat
East
West
Blackwater
Hampton Creek
Green
Creek
Roys Point
Tidal
Flat
Oak
Cow Creek Pond
Cow
Creek
Nuttall
Elmington
Elmington Creek
Pig Hill
Pig
Cradle Pt
Tidal Flats
Cem
Auburn Wharf
NORTH RIVER
Back Creek
Talia
Tidal
Flat
Thomas
5B
Belleville Cr
Lone Point
Lower
WARE
Glen Roy Estates
Cem
Deacons Neck
1 MILE

MAP 10B

NORTH RIVER

SHORELANDS TYPES

Segments 5A and 5B

FASTLAND

- Low Shore
- Low Shore with Bluff
- Moderately Low Shore

SHORE

- Beach
- Fringe Marsh
- Embayed Marsh
- Artificially Stabilized

NEARSHORE

- Intermediate

76° 27' 30"

37° 25'

Mt Zion Ch

Cow Creek Pond

Pig Hill

Deacons Neck

Glen Roy Estates

Elmington

Cradle Pt

Auburn Wharf

Roys Point

North

Emmaus Ch

Hampton Creek

Blackwater Creek

CHAPEL NECK

NORTH

WARE

5B

1 MILE

MAP 10C

NORTH RIVER

FASTLAND USE, OWNERSHIP, EROSION

Segments 5A and 5B

USE	
Agricultural	A
Recreational	RC
Residential	RS
Unmanaged Wooded	W
OWNERSHIP	
Private	1
County	4
EROSION	
Moderate	|||||||
Slight or No Change	No Symbol

76°27'30"

37°25'

5A

5B

NORTH

WARE

CHAPEL CK

Mt Zion Ch
Cems

Lothian

Hot

Hill

Cem

Tabb

Todd

Toddsbury Cr

Nuttall

Cow Creek Pond

Elmington

Elmington Creek

Pig Hill

Pig

Glen Roy Estates

Cem

Deacons Ne

Tidal Flats

Cradle Pt

Cem

Auburn Wharf

Hampton Creek

Green

Creek

Roys Point

Oak

Tidal Flat

Back Creek

Tidal

Thomas

Belleville Cr

Lane Point

Lower

North

Emmaus Ch

1 MILE

MAP 11A (619)

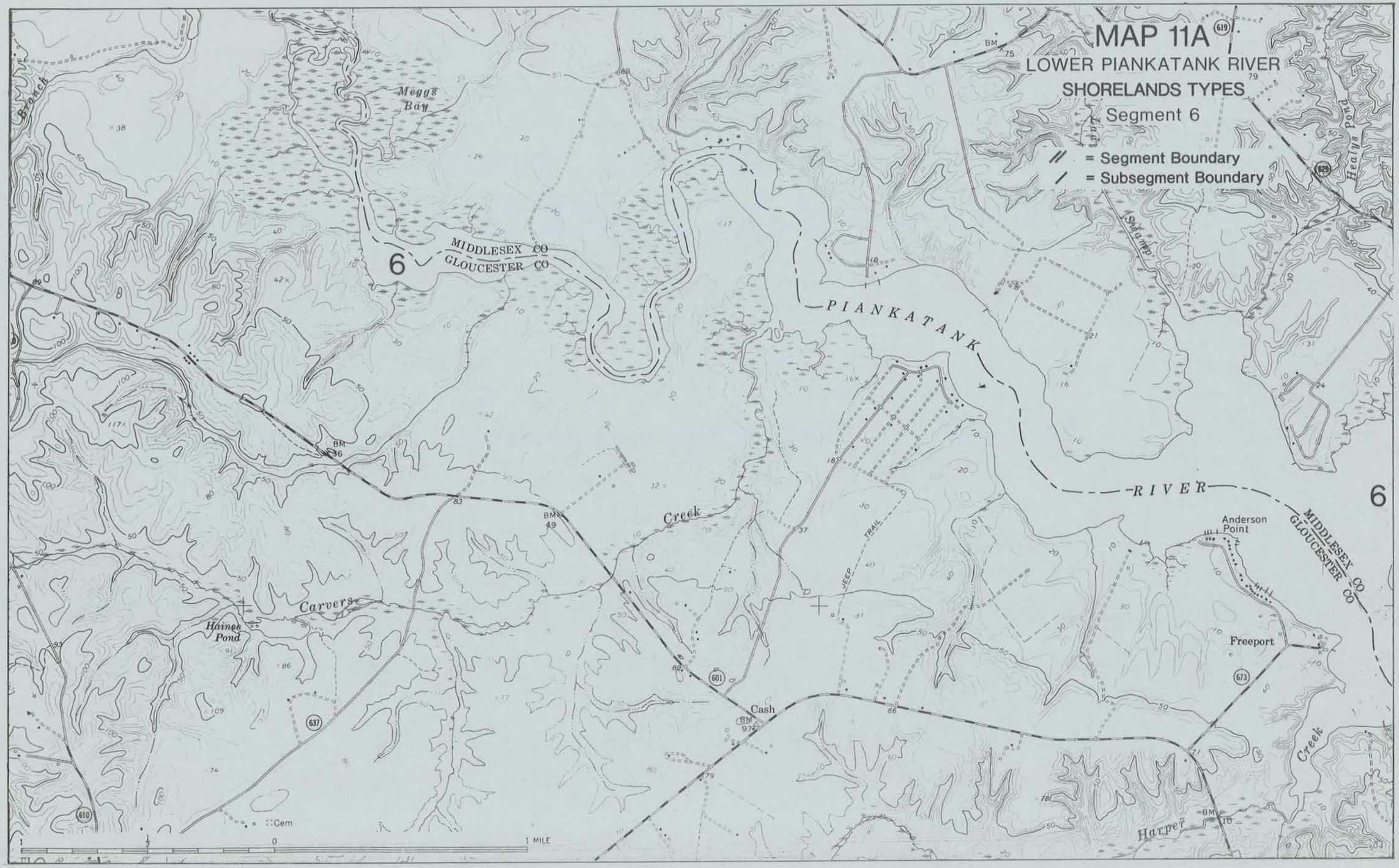
LOWER PIANKATANK RIVER

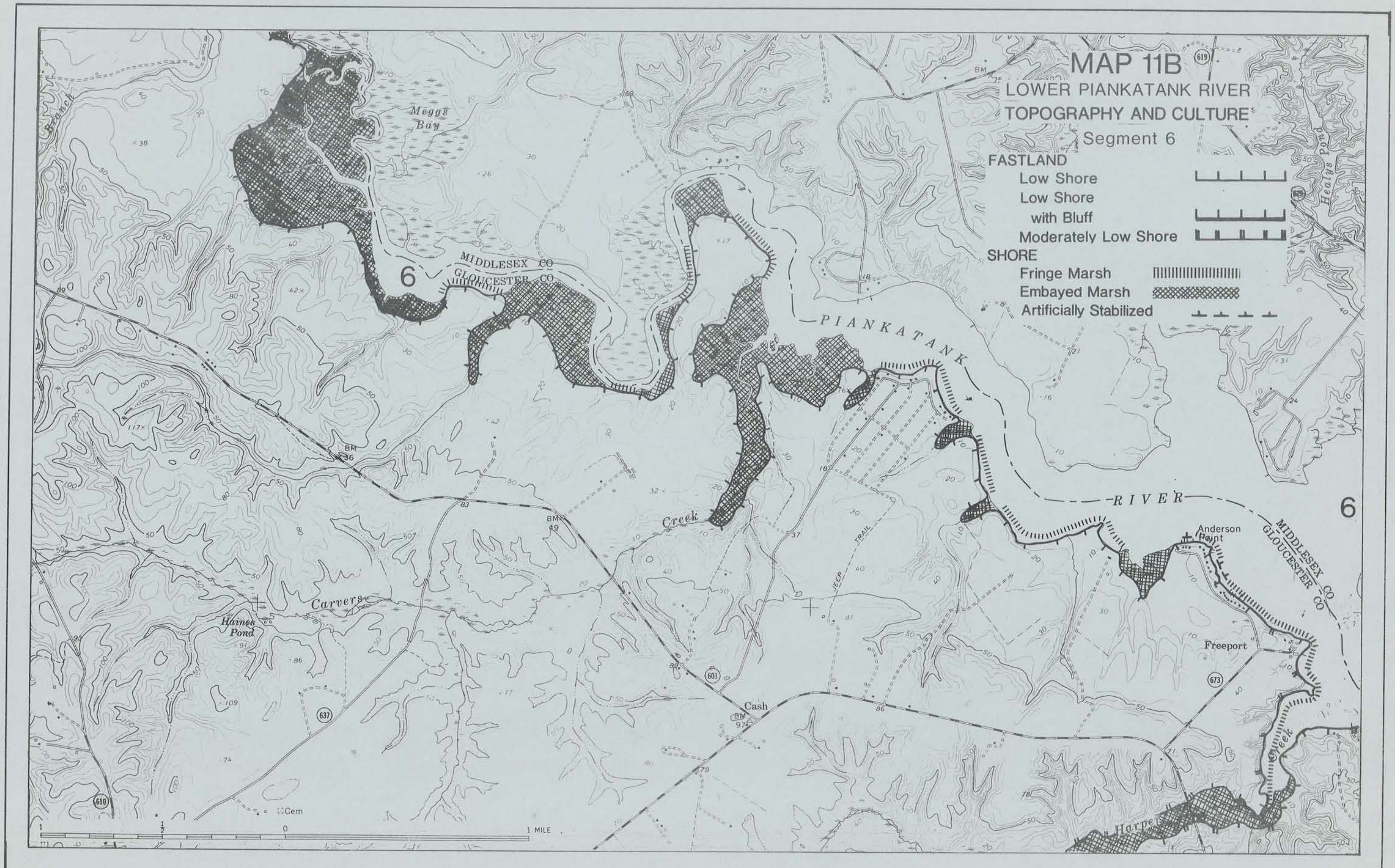
SHORELANDS TYPES

Segment 6

// = Segment Boundary

/ = Subsegment Boundary




MAP 11B
LOWER PIANKATANK RIVER
TOPOGRAPHY AND CULTURE
Segment 6
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
SHORE
Fringe Marsh
Embayed Marsh
Artificially Stabilized
Meggs Bay
MIDDLESEX CO
GLOUCESTER CO
PIANKATANK
RIVER
Creek
Carvers
Haines Pond
Cash
Anderson Point
Freeport
Healys Pond
JEEP TRAIL
Harper
Creek
6
1 MILE

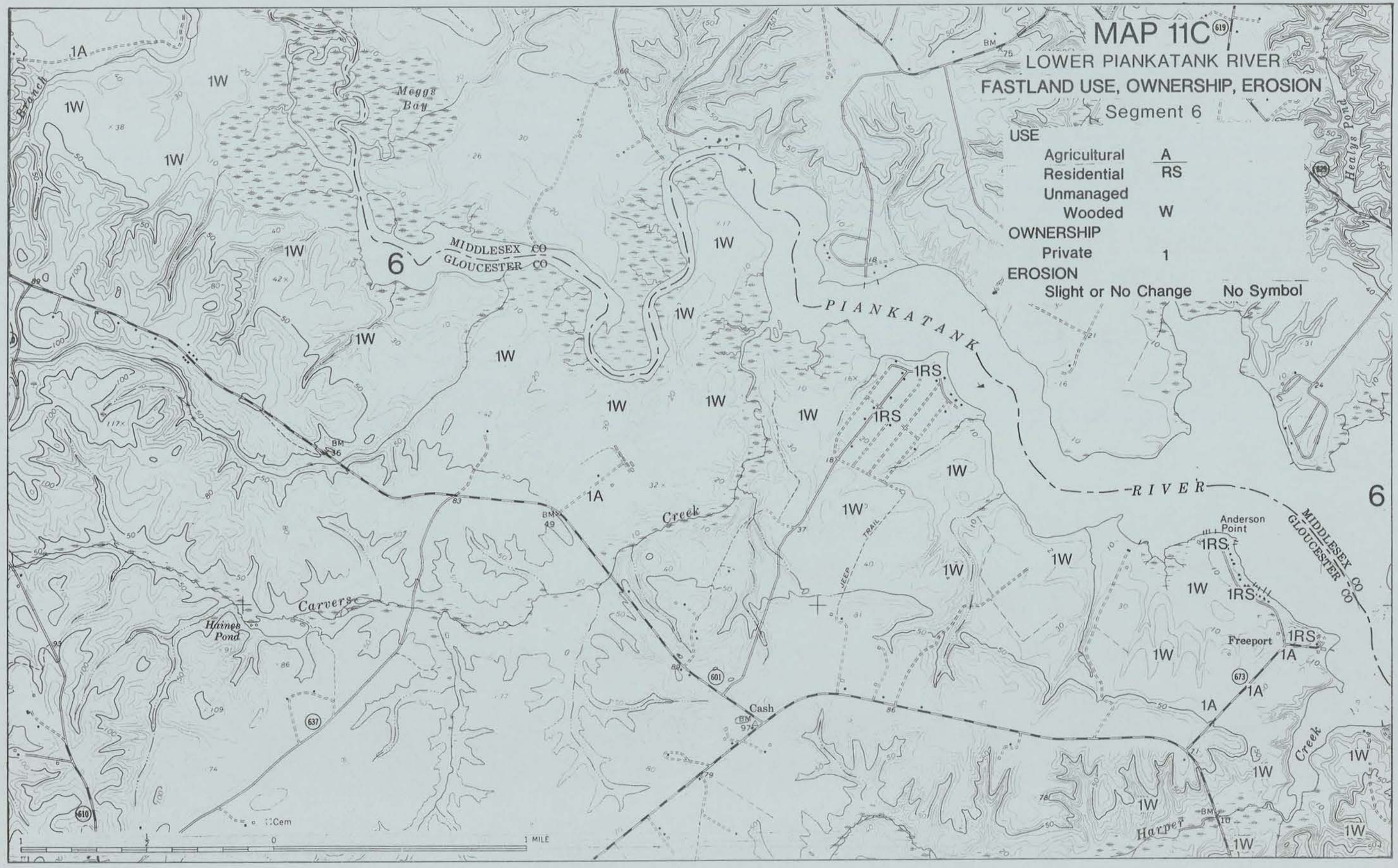
MAP 11C

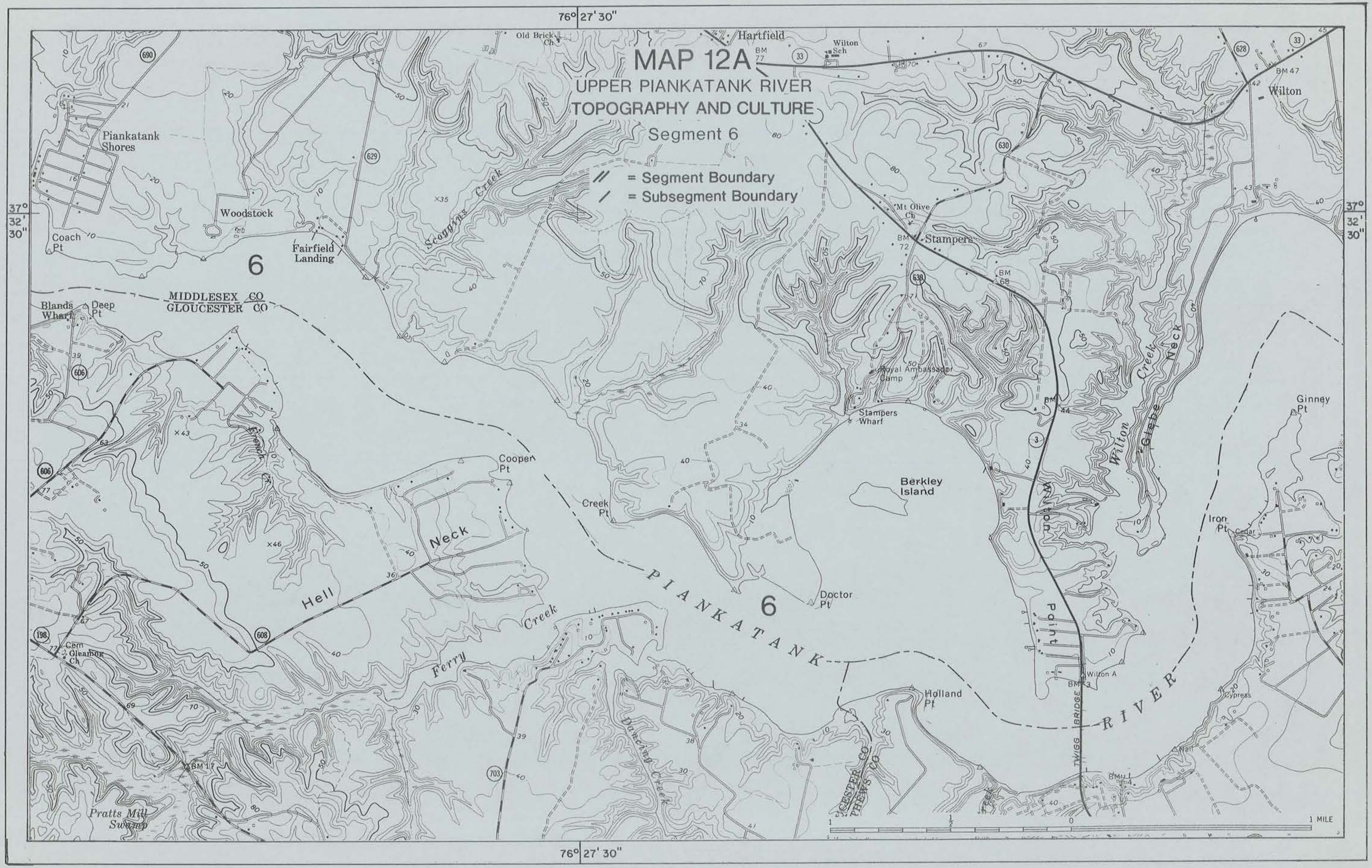
LOWER PIANKATANK RIVER

FASTLAND USE, OWNERSHIP, EROSION

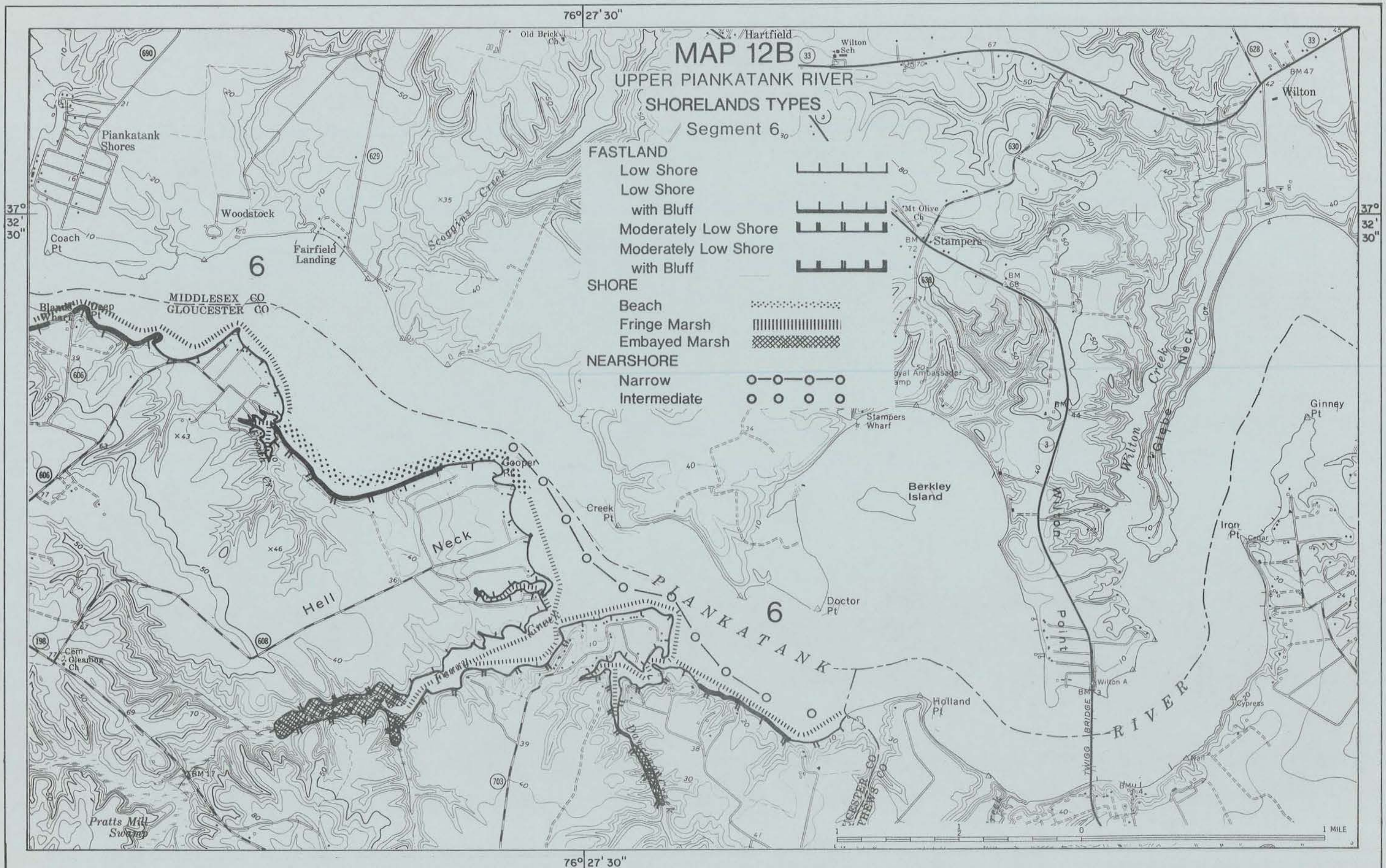
Segment 6

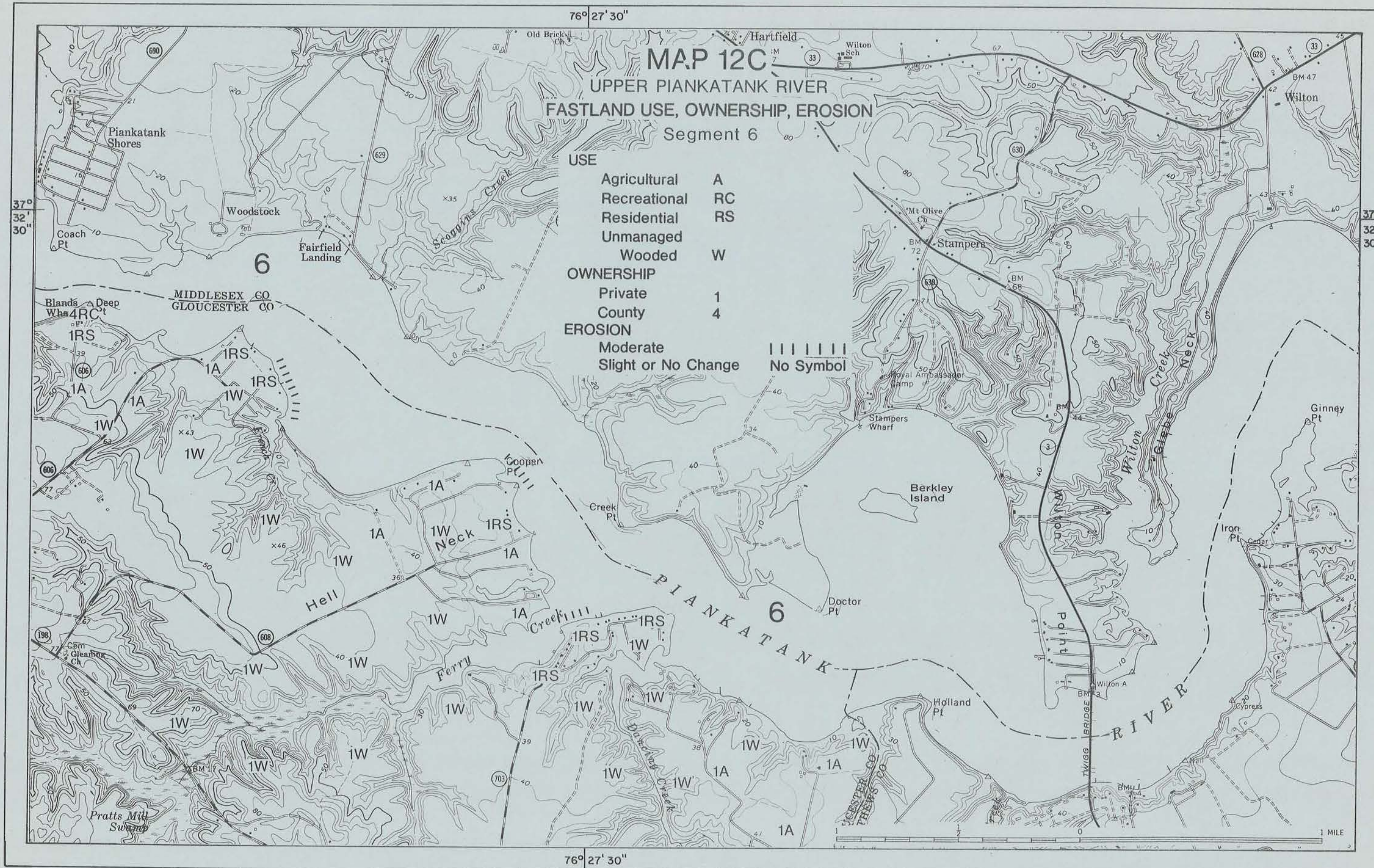
USE	
Agricultural	A
Residential	RS
Unmanaged Wooded	W
OWNERSHIP	
Private	1
EROSION	
Slight or No Change	No Symbol





MAP 12A
UPPER PIANKATANK RIVER
TOPOGRAPHY AND CULTURE
Segment 6
// = Segment Boundary
/ = Subsegment Boundary
76° 27' 30"
37° 32' 30"
Hartfield
Old Brick Ch
Wilton Sch
Wilton
Piankatank Shores
Woodstock
Coach Pt
Fairfield Landing
Scoggins Creek
MIDDLESEX CO
GLOUCESTER CO
Blands Wharf
Deep Pt
Mt Olive Ch
Stampers
Royal Ambassador Camp
Stampers Wharf
Berkley Island
Wilton Creek
Glebe Neck
Ginney Pt
Iron Pt
Cooper Pt
Creek Pt
Doctor Pt
Holland Pt
Hell Neck
Ferry Creek
Dancing Creek
PIANKATANK RIVER
Wilton Point
TWIGG BRIDGE
Wilton A
Pratts Mill Swamp
Cem
Gleaning Ch
Cedar
Cypress
1 MILE


MAP 12B
UPPER PIANKATANK RIVER
SHORELANDS TYPES
Segment 6
FASTLAND
Low Shore
Low Shore with Bluff
Moderately Low Shore
Moderately Low Shore with Bluff
SHORE
Beach
Fringe Marsh
Embayed Marsh
NEARSHORE
Narrow
Intermediate
76° 27' 30"
37° 32' 30"
Hartfield
Wilton Sch
Wilton
Old Brick Ch
Piankatank Shores
Woodstock
Coach Pt
Fairfield Landing
Scoggins Creek
MIDDLESEX CO
GLOUCESTER CO
Mt Olive Ch
Stampers
Stampers Wharf
Royal Ambassador Camp
Cooper Pt
Creek Pt
Berkley Island
Doctor Pt
Holland Pt
Hell Neck
PIANKATANK
RIVER
Wilton Creek
Glebe Neck
Wilton Point
TWIGG BRIDGE
Ginney Pt
Iron Pt
Cedar
Cypress
Glenns Ch
Pratts Mill Swamp
1 MILE
6
6


MAP 12C
UPPER PIANKATANK RIVER
FASTLAND USE, OWNERSHIP, EROSION
Segment 6
USE
Agricultural A
Recreational RC
Residential RS
Unmanaged Wooded W
OWNERSHIP
Private 1
County 4
EROSION
Moderate
Slight or No Change No Symbol
76° 27' 30"
37° 32' 30"
Piankatank Shores
Woodstock
Coach Pt
Fairfield Landing
Old Brick Ch
Hartfield
Wilton Sch
Wilton
Scoggins Creek
Mt Olive Ch
Stampers
Royal Ambassador Camp
Stampers Wharf
Berkley Island
Wilton Creek Neck
Glebe
Wilton Point
Ginney Pt
Iron Pt
Cedar
Cypress
MIDDLESEX CO
GLOUCESTER CO
Blands Wha
Deep Pt
Cooper Pt
Creek Pt
Doctor Pt
Holland Pt
French Cr
Hell Neck
Ferry Creek
Dancing Creek
PIANKATANK RIVER
Cem Gleaner Ch
Pratts Mill Swamp
TWIGG BRIDGE
Wilton A
1 MILE