1974

Shoreline Situation Report Newport News, Virginia

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Special Report In Applied Marine Science and Ocean Engineering Number 55
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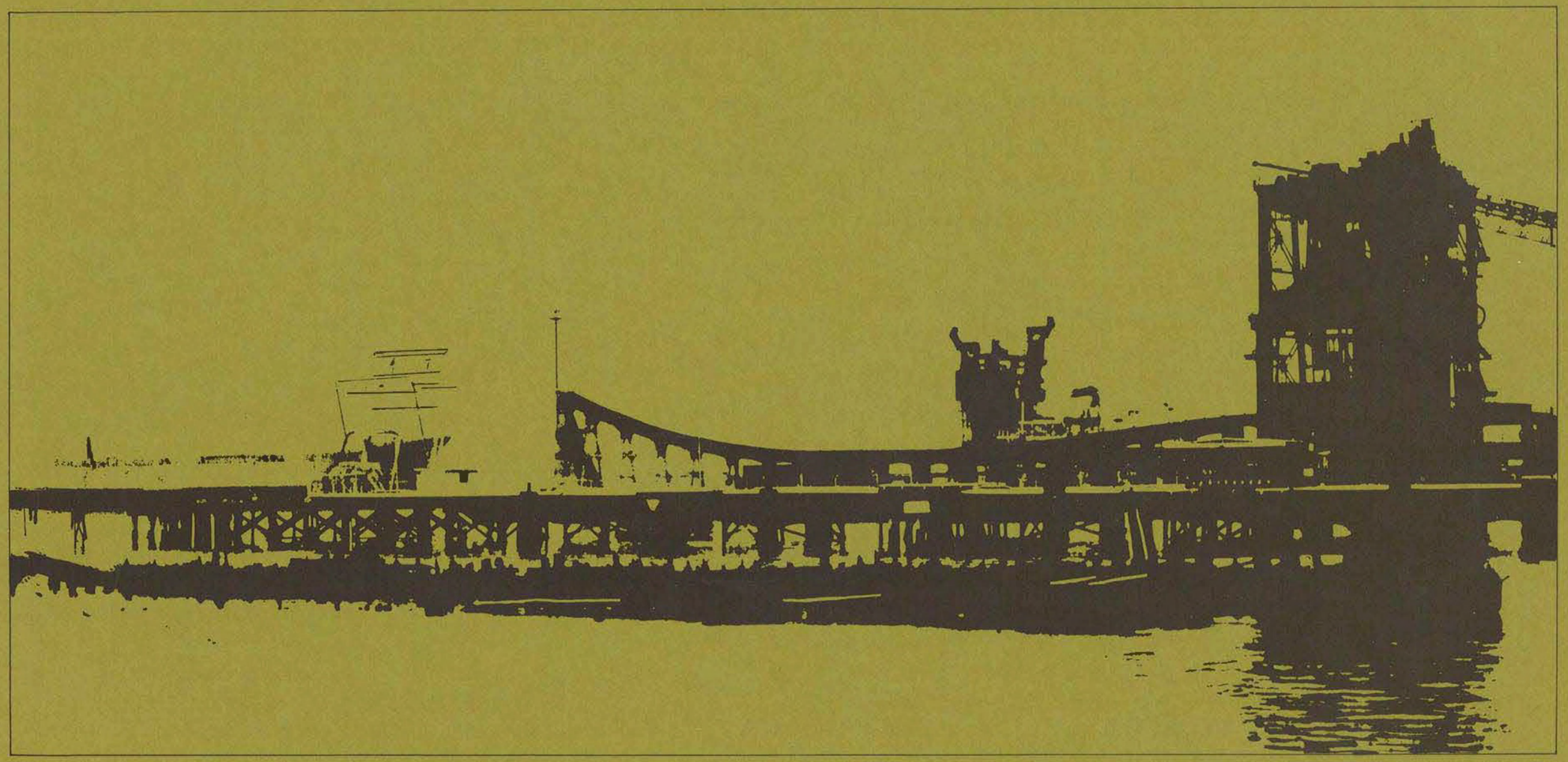

Supported by the National Science Foundation, Research Applied to National Needs Program
NSF Grant Nos. GI 34869 and GI 38973 to the Chesapeake Research Consortium, Inc.

VIRGINIA INSTITUTE OF MARINE SCIENCE
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 terms 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 alterating or enhancing the present configuation 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 administered through the Chesapeake Research Consortium (CRC), Inc. George Dawes and Gene Silberhorn of the VIMS Wetlands Section contributed many useful ideas and criticisms. David Byrd, Edward Hogge, Dennis Owen, Gaynor Williams, and Peter Rosen assisted with the data reduction. Beth Tillage and Cindy Otey typed the manuscript. Jane Davis, Kaye Stubblefield, Joe Gilley, Russell Bradley, Ken Thornberry, and Bill Jenkins prepared the graphics. We also thank the numerous other persons in Maryland and Virginia who have criticised and commented upon our ideas and methods.

CHAPTER 2
APPROACH USED AND ELEMENTS CONSIDERED

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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 low altitude, oblique, color, 35 mm photography were used. 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 mapping 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 sub-segment, which may range from a few hundred feet to several thousand feet in length. The end points of the sub-segments were generally chosen on physiographic considerations 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 sub-segment. Segments are a grouping of sub-segments. The boundaries for segments also were selected on physiographic units such as necks or peninsulas between major tidal creeks. Finially, 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 sub-segment (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 sub-segments.

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 elements; the fastlands, the shore and the nearshore. A physiographic classification based upon these three elements has been devised as it provides the opportunity to examine joint relationships amongst the elements. As an example, the application of the system permits the user to determine miles of high bluff shoreland interface 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 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 effi-

cient 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, occuping 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 (see Table 1) is based upon the slope of the land near the water.

Low shore, 20-ft. (6 m) contour > 400 ft. (122 m) from fastlands shore boundary

Moderately low shore, 20-ft. (6 m) contour < 400 ft. (122 m); with or without cliff

Moderately high shore, 40-ft. (12 m) contour < 400 ft. (122 m); with or without cliff

High shore, 60-ft. (18 m) contour < 400 ft. (122 m); with or without cliff

Dune

Artificial fill, urban and otherwise

Nearshore Zone

The nearshore zone extends from the shore zone to the minus 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 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.

These definitions have no legal significance and were constructed for our classification purposes.

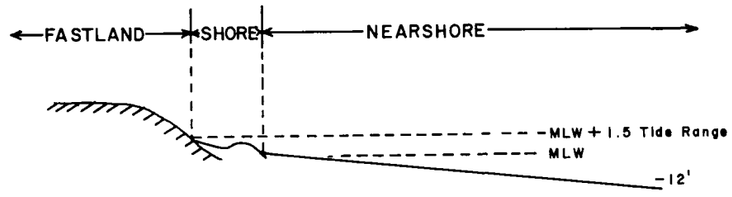
Narrow, 12-ft. (3.7 m) isobath located < 400 yards from shore

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

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

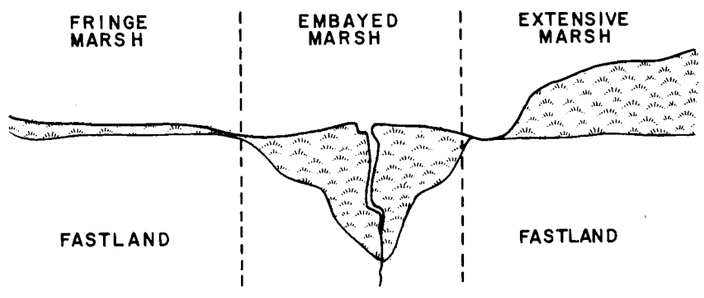
Subclasses: with or without bars
with or without tidal flats
with or without submerged vegetation

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) Shoreland Use Classification:

Fastland

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 with the general commercial context. Marinas are considered commercial shore use.

Industrial

Includes all industrial and associated areas. Examples: wharehouses, 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

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 is a basic subdivision, private and governmental further divided into federal, state, county, and town or city. Application of the classification is restricted to fastlands alone since in 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 subsegments 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 each 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 non-critical. 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 compraisons of shoreline positions between the 1850 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. Finially, 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 emphases is placed on expected effectiveness with secondary considerations 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 is 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 1973 (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 the 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 probably 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 judgement 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 SHORELINE SITUATION OF NEWPORT NEWS

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3.1 THE SHORELANDS OF NEWPORT NEWS

The shorelands of Newport News reflect the diversity evident within the general makeup of the city itself. Running from the virtually untouched marshes of Fort Eustis to the artificially filled and maintained shoreline of the shipyards, the city's shorelands are open to few generalizations.

As may be seen on Table 2, the fastlands of Newport News are classifiable into one of three types: low shore, moderately low shore, or artificial. The moderately low shore areas are the areas where 20 to 40-foot high bluffs descend from a nearly level upland terrace to the water. Most of the bluffs are unvegetated and waste downslope. The erosion of the unprotected bluffs along the James River in Segments 4 and 5 is accelerated by wave action and occasional high water levels.

The low shore in Segments 2 and 3 is the non-marsh area of the low lying Mulberry Island complex which comprises most of Fort Eustis. The low shore of Segment 6 is an even, low plain, or terrace, that was cut during the last higher stand of sea level.

The artificial fastland area of Fort Eustis is a dirt filled section of shorelands only a little above beach level. Goose Island (Subsegment 2A), a peninsula at the mouth of Skiffes Creek, is an old spoil disposal site that now is well vegetated and is considered low shore. The Small Boat Harbor area (Subsegment 5D) at Newport News Point is a fill area.

The shore type generally reflects the fastland type. The great majority of the 25-hundred acres of marsh within the Newport News city limits (Table 3) are extensive marsh that is associated with the low shore areas of Segments 2 and 3. Much of the city's embayed marsh is contiguous with the extensive marsh. Table 3 is a preliminary tabulation of marsh acreages. Wetlands scientists at the Virginia Institute of Marine Science are preparing a more complete inventory of the Wetlands of Newport News.

Except for the Small Boat Harbor and the shipyard, the remainder of the city's shore is beach. A large portion of the beach, however, is backed by a seawall or bulkhead.

The only public "bathing" beaches, as such, in Newport News are at Huntington Park near the James River Bridge and at Lincoln Park, northeast of Newport News Point. There are, however, several small private beaches.

The two greatest single users of the Newport News shoreline are the United States Army and the shipping industry. Fort Eustis controls, hence uses, roughly forty-four percent of the city's shoreline (Table 4). Although most of the compound is zoned residential, (Table 5) only a small portion is used for residences. The southern sections of the city essentially are used by the shipbuilding and shipping industries. Subsegments 5A and 5B are zoned for heavy industry and are so used. The area of Subsegment 5B that is north of Christopher Newport Park (5C) is the Newport News Shipbuilding and Drydock Company, while south of the park is the marine terminal area.

Most of the remainder of the city's shoreline is zoned and used for residential purposes. North of Lake Maury, the housing density appears to decrease as the size and expense of the houses increases.

Deep Creek (Subsegment 3D) (Figure 3), at the mouth of the Warwick River, is a major smallboat harbor. As well as serving as the base of the James River - Hampton Roads oyster boat fleet, it is the site of several large marinas.

With the exception of the boat yard or shipyard areas, there is little formal use of the beach or marsh areas of the shorelands. The nearshore and offshore areas are used for shipping, boating, and shellfishing. Table 6 is a listing of the oyster grounds within the waters of Newport News.

3.2 SHORELINE EROSION IN NEWPORT NEWS

The processes causing shoreline erosion in Newport News are fairly limited. By comparison to the open ocean or Chesapeake Bay, the James River and Hampton Roads are relatively low energy water bodies. Much of the city's shoreline is protected, in some manner, from the forces of erosion.

Much of the erosion in Newport News might more aptly be termed "weathering" as it largely is simple downslope wasting of the river bank bluffs accelerated somewhat by the water. Wave induced erosion is a problem to the bluff areas during times of high northwest or southwest winds as those winds tend both to pile up water on the Newport News shore and to attack the toe of the fastland with small, though short and steep, waves.

Severe storms, either northeasters or hurricanes, also may accelerate the erosion of the shorelands through greatly increased water levels even though the local wind may be offshore.

The normal tidal range is fairly low throughout the Newport News area and, except during times of floods, the James River's currents probably are not significant in terms of river bank erosion.

Newport News does not have a significant shoreline erosion problem. However, excluding Fort Eustis, there are three erosion areas which are deserving of some concern. These areas are Anderson Park, Huntington, and the small area adjacent to Fishers Creek.

Historically, the shore adjacent to Hampton Flats west of longitude 76°23', including Anderson Park, has been a site of erosion. Since 1854 the unprotected shoreline has been retreating at an average rate of roughly two feet per year. Since 1933 the area north of Slaters Creek has been protected with a stone and concrete seawall (Figure 4). The unprotected shoreline of Anderson Park is retreating, threatening paved walkways and removing valuable public open space (Figures 5 and 6). There have been some attempts at protection utilizing construction rubble, but these attempts are only minimally effective. As this area is part of a proposed park renovation and expansion program, the Newport News Recreation and Parks Department is taking an active interest in the problem and is negotiating with the U. S. Army Corps of Engineers for the construction of a seawall. Either the construction of a seawall or the placing of proper stone riprap appears to be the only satisfactory method of containing the erosion.

In the Huntington area, a 25-foot bluff is retreating at an estimated rate approaching two feet per year. This rate is not extreme, but the street at the top of the bluff soon will be threatened (Figures 7 and 8). At present rubble riprap and dumped fill is slightly hindering the erosional processes. The problem is not now severe and the construction of the new extention to the shipyard may alter the local conditions enough to change the nature of the problem. There is a similar small problem in Huntington Park.

The third problem zone, the Blunt Point - Fishers Creek - Deep Creek area is the most dramatic. Although no structures yet have fallen down the bluff, many trees have fallen and many more are precariously balanced on the steep slope (Figures 9 and 10).

Some portions of this area are quite satisfactorily protected by seawalls or bulkheads or some compound combination of seawalls, groins, and landscaping. With few exceptions, the groins are not significantly effective in building a beach in front of the bulkhead. Virtually all the groins show some trapping; however, the size of the fillet is limited by the small size and great permeability of the groins. Two long, high groins have trapped a significant fillet (Figure 11), to the extent of incipient aeolian dunes forming on the backshore. In general, groins are not a satisfactory method of protecting a backshore, at least until a sizeable fillet has accreted. Thus in order to protect the bluff near Fishers Creek, one must mechanically fill the groins or seek an alternative solution. Such an alternative would be a continuous bulkhead or a continuous bulkhead with a graded fastland (Figure 12).

In summary, the shoreline erosion problems of Newport News are neither severe nor significant. The lack of erosion as a problem is due to two factors: (1) the great extent of shore defenses already in existance and (2) the limited erosive energy of the James River and Hampton Roads. The erosion that does take place results from normal downslope movement of unconsolidated sediments at times accelerated by storm actions.

3.3 POTENTIAL USE ENHANCEMENT OF THE NEWPORT NEWS SHORELINE

The potential use enhancement of the Newport News shoreline is quite limited as there are few undeveloped, community owned shore areas in the city. At present the city has plans to expand and remodel the existing Anderson Park - Salters Creek (Peterson's Boat Basin) facility. These plans call for the relocation of the marina to a more advantageous position at the mouth of Salters Creek, acquisition of more park land, and a general cleaning and revitalization of the area. The city also is attempting to build a public boat ramp at the foot of Denbigh Boulevard (Hoopes Landing).

There is little area available for public swimming. There is some swimming at Huntington near the James River Bridge, but there is little elsewhere in the city. Lincoln and Anderson Parks are sites of much wading and fishing but little actual swimming.

Excluding water quality considerations the beaches at Lincoln Park and Anderson (Figure 4 and 5) could be enhanced through a program of artificial nourishment and of replacing the unsightly, dumped construction-rubble and trash riprap with either properly placed stone riprap or a seawall.

Christopher Newport Park is a small, pleasant garden area overlooking the busy James River, but

due to its small size and proximity to the port facilities it has little potential for expansion.

The Warwick River area, with its relatively long navigable channel, perhaps offers the best possibility for recreational development, provided suitable public access (such as boat ramps) can be acquired.

Figure 3

Figure 4

Figure 5

Figure 3: Deep Creek, a major commercial and pleasure boat harbor for the Newport News area.

Figure 4: Seawall on Hampton Roads along Chesapeake Avenue near the Newport News - Hampton boundary. The pipes emerging through the wall are storm drains.

Figure 5: The virtually unprotected shoreline of Anderson Park in the Stuart Gardens area of the city. The groins and dumped rubble riprap contribute little to the defense of the shoreline.

Figure 6: Ground view of the area shown in Figure 5. Shoreline erosion is threatening the paved walkway.

Figure 7: River Road near 70th Street. Erosion is cutting the bluff and threatening the road.

Figure 6

Figure 7

Figure 8

Figure 9

Figure 8: Ground view of Figure 7. North extention of the Newport News Shipbuilding and Drydock Company is in the background.
Figure 9: Shoreline south of Deep Creek. Note erosion of the unprotected area near the center and the success of the long groins to the right in the photograph.
Figure 10: Erosion of the unprotected bluffs near the area shown in Figure 9.
Figure 11: The two long, high, impermeable groins in Figure 9. These two major groins and the lesser intermediate groin have trapped a significant fillet and are protecting the fastland.
Figure 12: Seawall and graded upland near the foot of Blount Point Road. The seawall is satisfactory except that it can be overtopped by moderate waves. The overtopping allows water to flow behind and to undermine the seawall. The graded upland eases problems of slope maintenance. Note the reflected waves near the wall and the resulting confused sea.

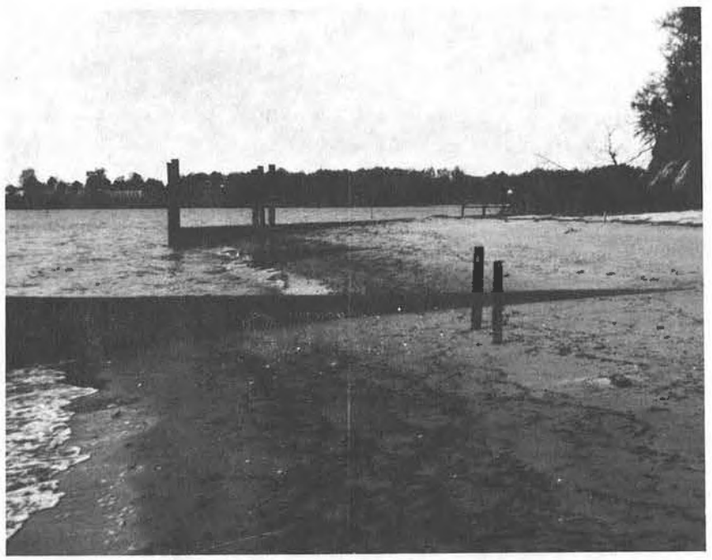


Figure 11

Figure 12

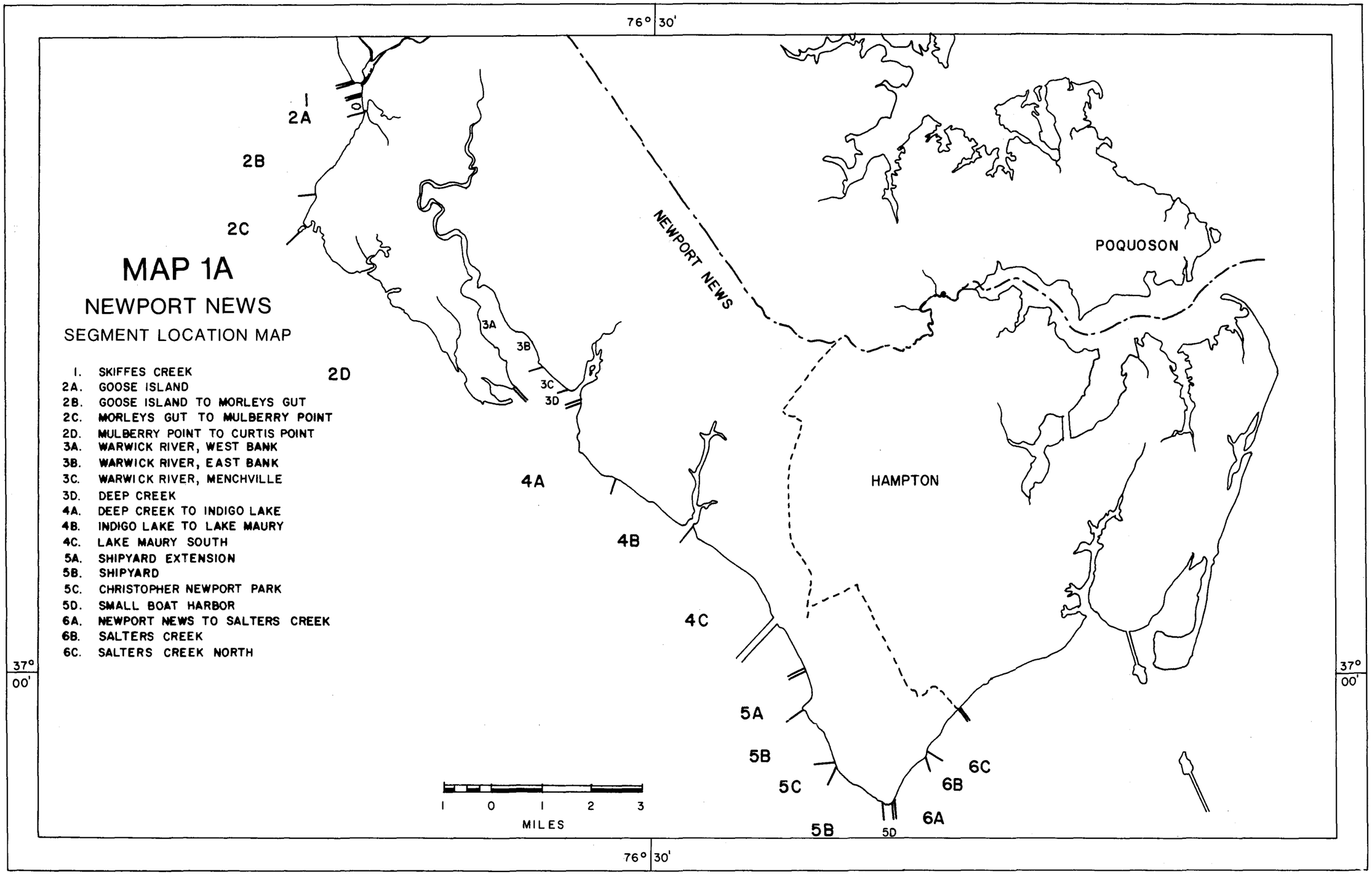
Figure 10

MAP 1A

NEWPORT NEWS

SEGMENT LOCATION MAP

1. SKIFFES CREEK
2A. GOOSE ISLAND
2B. GOOSE ISLAND TO MORLEYS GUT
2C. MORLEYS GUT TO MULBERRY POINT
2D. MULBERRY POINT TO CURTIS POINT
3A. WARWICK RIVER, WEST BANK
3B. WARWICK RIVER, EAST BANK
3C. WARWICK RIVER, MENCHVILLE
3D. DEEP CREEK
4A. DEEP CREEK TO INDIGO LAKE
4B. INDIGO LAKE TO LAKE MAURY
4C. LAKE MAURY SOUTH
5A. SHIPYARD EXTENSION
5B. SHIPYARD
5C. CHRISTOPHER NEWPORT PARK
5D. SMALL BOAT HARBOR
6A. NEWPORT NEWS TO SALTERS CREEK
6B. SALTERS CREEK
6C. SALTERS CREEK NORTH



MAP 1B

NEWPORT NEWS SHORELANDS TYPES

76° 30'

37° 00'

NEWPORT NEWS

POQUOSON

HAMPTON

2A 2B 2C 2D 3A 3B 3C 3D 4A 4B 4C 5A 5B 5C 5B 5D 6A 6B 6C

Fastland:

LOW SHORE
MODERATELY LOW SHORE with BLUFF
ARTIFICIAL

Shore

BEACH
FRINGE MARSH
EMBAYED MARSH
EXTENSIVE MARSH
ARTIFICIALLY STABILIZED

Nearshore

NARROW
INTERMEDIATE
WIDE

1 0 1 2 3
MILES

MAP 1C

NEWPORT NEWS

SHORELINE EROSION PROTECTION STRUCTURES WASTE DISCHARGES

Erosion

MODERATE //////
SLIGHT no symbol

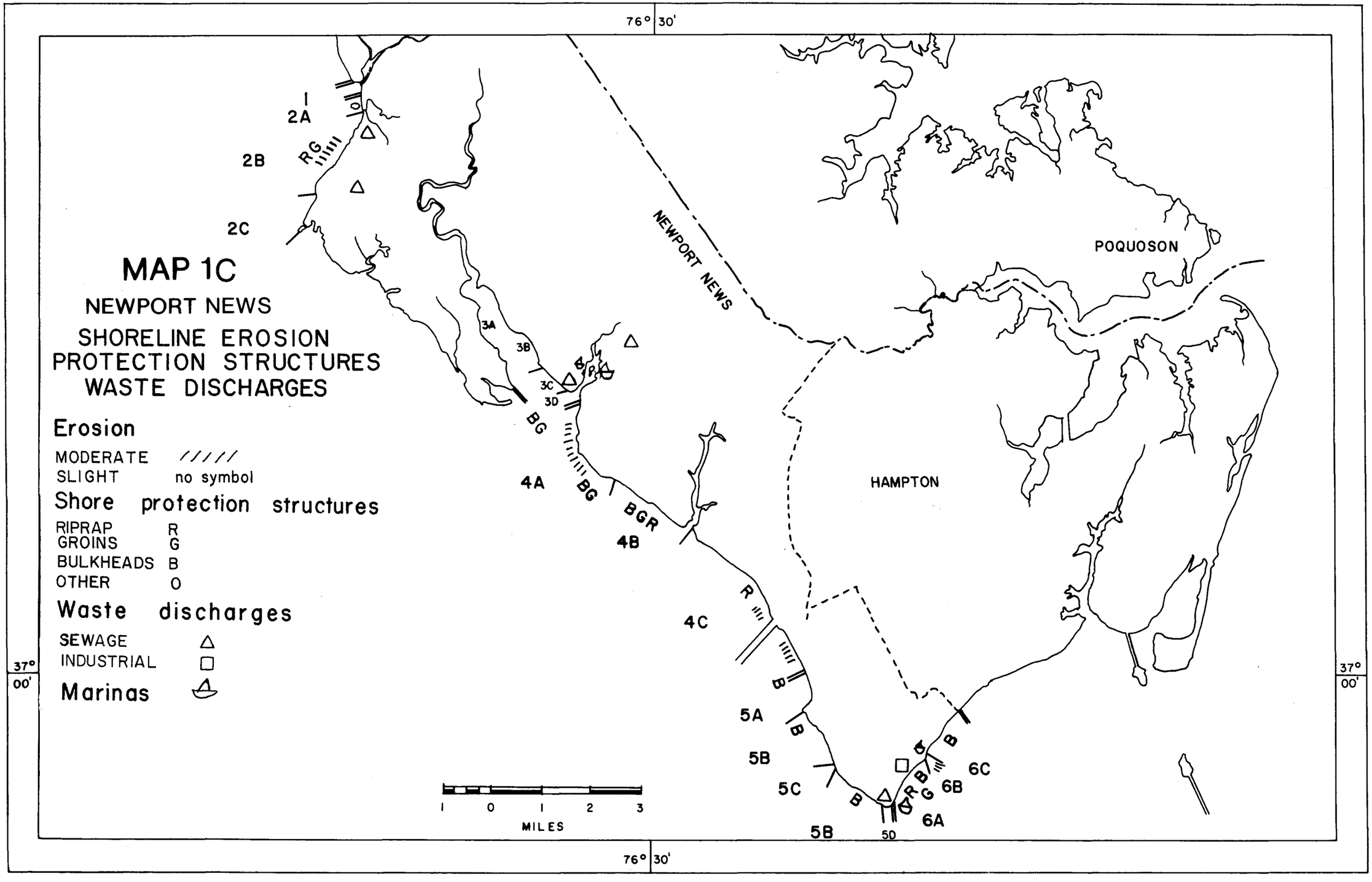
Shore protection structures

RIPRAP R
GROINS G
BULKHEADS B
OTHER O

Waste discharges

SEWAGE △
INDUSTRIAL □

Marinas



MAP 1D

NEWPORT NEWS

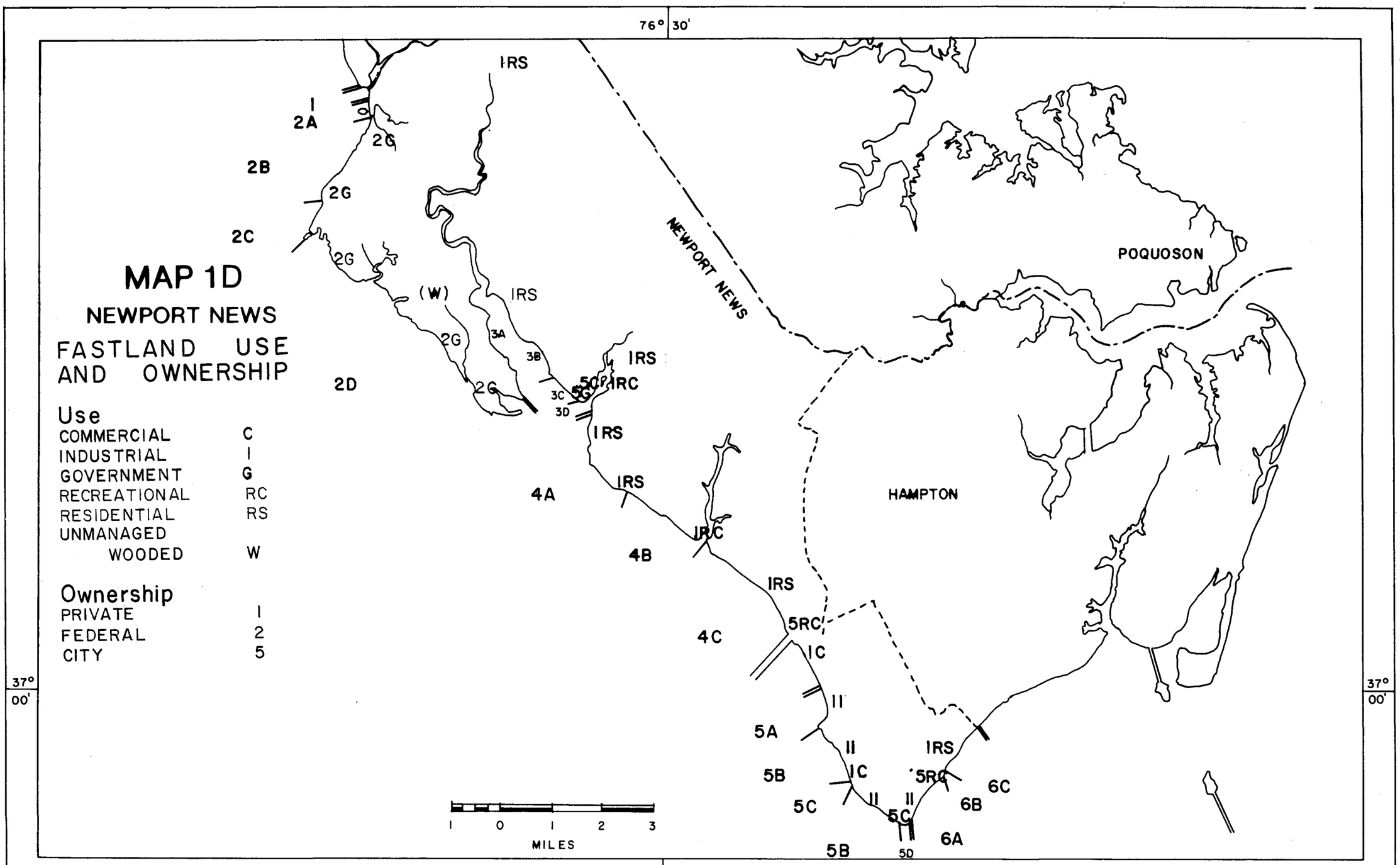
FASTLAND USE AND OWNERSHIP

Use

COMMERCIAL	C
INDUSTRIAL	I
GOVERNMENT	G
RECREATIONAL	RC
RESIDENTIAL	RS
UNMANAGED WOODED	W

Ownership

PRIVATE	1
FEDERAL	2
CITY	5



MAP 1E

NEWPORT NEWS

SHELLFISH AREAS

Condemnation Areas

Oyster Areas

76° 30'

37° 00'

NEWPORT NEWS

POQUOSON

HAMPTON

1A 1B 1C 2A 2B 2C 3A 3B 3C 4A 4B 4C 5A 5B 5C 6A 6B 6C 9D

1 0 1 2 3

MILES

TABLE 1. SUMMARY OF NEWPORT NEWS SHORELANDS PHYSIOGRAPHY, FASTLAND USE, OWNERSHIP (STATUTE MILES)

Physiographic, use and ownership classification / Subsegment	SHORELANDS PHYSIOGRAPHY											FASTLANDS USE					OWNERSHIP			TOTAL MILES
	FASTLANDS			SHORE					NEARSHORE											
	LOW SHORE WITH BLUFF	MODERATELY LOW SHORE WITH BLUFF	ARTIFICIAL FILL	BEACH	FRINGE MARSH	EXTENSIVE MARSH	EMBAYED MARSH	ARTIFICIALLY STABILIZED	NARROW	INTERMEDIATE	WIDE	COMMERCIAL	INDUSTRIAL	GOVERNMENTAL	RECREATIONAL	RESIDENTIAL	PRIVATE	FEDERAL	CITY	
1		4.0			1.0		3.0							0.4		3.6	3.6	0.4		4.0
2A	0.9		0.2		1.1					1.1				1.1				1.1		1.1
2B	1.8		0.3	0.6	1.5						2.1			2.1				2.1		2.1
2C	0.9				0.2	0.7				0.9				0.9				0.9		0.9
2D	6.3			0.1	1.8	4.4					6.3			6.3				6.3		6.3
3A	7.2	1.2			2.0	2.8	3.6							8.4				8.4		8.4
3B	1.4	6.9			1.4	3.2	3.7									8.3	8.3			8.3
3C		1.1		0.2	0.9						1.1			0.6		0.5	0.5		0.6	1.1
3D		0.5			0.4			0.1				0.2			0.2	.1	0.3		0.2	0.5
4A		2.3		1.6			0.7				2.3					2.3	2.3			2.3
4B		1.8		1.2				0.6			1.8				0.9	0.9	1.8			1.8
4C		3.3		1.8				1.5		0.9	2.4				1.7	1.6	2.8		0.5	3.3
5A			0.7							0.7			0.7				0.7			0.7
5B			2.5					2.5					2.5				2.5			2.5
5C		0.3		0.3					0.3			0.1			0.2		0.1		0.2	0.3
5D			0.6					0.6				0.3	0.3						0.6	0.6
6A	1.5			0.5				1.0	0.4	1.1			0.7		0.5	0.3	1.0		0.5	1.5
6B	0.1							0.1							0.1				0.1	0.1
6C	0.7							0.7			0.7					0.7	0.7			0.7
SUBTOTAL	20.8	21.4	4.3	6.3	10.3	11.1	11.0	7.1	0.7	4.7	16.6	0.6	4.2	19.8	3.6	18.3	24.6	19.2	2.7	46.5
% of SHORELINE	44.8	46.0	9.2	13.7	22.5	24.3	24.0	15.5	1.4	10.1	35.7	1.2	9.0	42.6	7.7	39.5	52.9	41.3	5.8	

TABLE 2
NEWPORT NEWS FASTLAND TYPE

TYPE		SEGMENT 1	2	3	4	5	6	TOTAL
LOW SHORE	Ft.	-	52,300	45,500	-	-	12,200	110,000
	%	-	21.4	18.6	-	-	5.0	45.0
MODERATELY LOW SHORE	Ft.	21,000	-	51,300	38,200	1,350	-	111,850
	%	8.6	-	21.0	15.6	0.5	-	45.7
ARTIFICIAL	Ft.	-	2,500	-	-	20,450	-	22,950
	%	-	1.0	-	-	8.4	-	9.4
TOTAL	Ft.	21,000	54,800	96,800	38,200	21,800	12,200	244,800
	%	8.6	22.4	39.5	15.6	8.9	5.0	100.0

TABLE 3
WETLANDS ACREAGE
NEWPORT NEWS, VIRGINIA

Segment and Subsegment	Fringe Marsh	Extensive Marsh	Embayed Marsh	Total
NN1: SKIFFES CREEK	-	-	104	104
NN2: FORT EUSTIS	15	1,121	119	1,255
NN2A:	15	-	-	
NN2B:	-	-	119	
NN2C and NN2D:	-	1,121	-	
NN3: WARWICK RIVER	84	530	460	1,074
NN3A:	62	296	157	
NN3B:	-	234	209	
NN3C:	22	-	-	
NN3D:	-	-	94	
NN4: HILTON-RIVERSIDE	-	-	74	74
NN4A:	-	-	67	
NN4B:	-	-	7	
NN6: HAMPTON ROADS	-	-	22	22
NN6B:	-	-	22	
TOTALS	99	1,651	779	
GRAND TOTAL				2,529

TABLE 4
NEWPORT NEWS EASTLAND USE

USE		SEGMENT 1	2	3	4	5	6	TOTAL
RESIDENTIAL	Ft.	-	-	48,000	34,800	-	8,200	91,000
	%	-	-	19.6	14.2	-	3.4	37.2
COMMERCIAL	Ft.	-	-	-	-	700	-	700
	%	-	-	-	-	0.3	-	0.3
INDUSTRIAL	Ft.	-	-	-	-	20,450	2,100	22,550
	%	-	-	-	-	8.4	0.9	9.3
GOVERNMENTAL	Ft.	3,000	54,800	48,800	-	-	-	106,600
	%	1.2	22.4	20.0	-	-	-	43.6
RECREATIONAL	Ft.	-	-	-	3,400	650	1,900	5,590
	%	-	-	-	1.4	0.3	0.7	2.4
UNMANAGED, WOODED	Ft.	18,000	-	-	-	-	-	18,000
	%	7.4	-	-	-	-	-	7.4
TOTAL	Ft.	21,000	54,800	96,800	38,200	21,800	12,200	244,800
	%	8.6	22.4	39.5	15.6	8.6	5.0	100.0

TABLE 5
NEWPORT NEWS SHORELINE ZONING

ZONING CLASSES	SEGMENT 1	2	3	4	5	6	TOTAL	PERCENT
R1	1,500	-	45,200	32,500	-	-	79,250 ft.	32.3
R1A	9,500	54,800	46,000	-	-	-	110,300	45.0
R1B	-	-	5,600	-	-	1,400	7,000	2.9
R1C	4,700	-	-	2,100	-	-	6,800	2.8
R2AM	1,400	-	-	-	-	-	1,400	0.6
R2C	1,300	-	-	-	-	4,250	5,550	2.3
R2D	-	-	-	2,800	-	3,800	6,600	2.7
C2	-	-	-	750	-	-	750	0.3
DB	-	-	-	-	1,350	-	1,350	0.6
M1	1,500	-	-	-	-	2,750	4,250	1.7
M2	1,100	-	-	-	20,450	-	21,550	8.8
TOTALS Ft.	21,000	54,800	96,800	38,200	21,800	12,200	244,800	
%	8.6	22.4	39.5	15.6	8.9	5.0		100

NEWPORT NEWS ZONING CLASSES

R1: Single family dwelling.

R1A: Residential - agricultural.

R1B: Single family dwelling.

R1C: Single family dwelling.

R2AM: Mobile dwelling.

R2C: Multiple family dwelling.

R2D: Highrise multiple family dwelling.

C2: Retail commercial.

M1: Light industry.

M2: Heavy industry.

TABLE 6
NEWPORT NEWS OYSTER GROUND

WATER	LEASED TRACTS NUMBER	LEASED TRACTS ACRES	PUBLIC ACRES	CONDEMNATION NUMBER	CONDEMNATION ACRES
JAMES RIVER	207	5,004	27,818	23	3,392
DEEP CREEK	5	13	-	-	-
MORRISON CREEK	1	3	-	-	-
WARWICK RIVER	36	903	17	34	699
				55	714
HAMPTON ROADS	13	82		7&15	36,275*
	7	815			

*1,100 conditionally condemned

CONDEMNATION AREAS, EXPLANATION

7 Extremely heavy population density, sewage, docks with heavy boat activity, marinas, oil storage terminal and oyster plants, Elizabeth River.

23 Adjacent to Fort Eustis. Sewage from Fort Eustis, Williamsburg, and Jamestown. Industrial effluent from Dow-Badische, shipping.

34&55 Boat pollution and sewage treatment plant.

CHAPTER 4

4.1 TABLE OF SUBSEGMENT SUMMARIES
4.2 SEGMENT AND SUBSEGMENT DESCRIPTIONS
4.3 SEGMENT AND SUBSEGMENT MAPS

4.1 SEGMENT AND SUBSEGMENT SUMMARY TABLES

SHORELINE SITUATION REPORT SEGMENT SUMMARY FOR NEWPORT NEWS, VIRGINIA

SEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	WATER QUALITY	FLOOD HAZARD	SHORE EROSION SITUATION	POTENTIAL USE ENHANCEMENT
1 SKIFFES CREEK 4 miles	Fastland: Moderately low shore with bluff. Shore: Fringe and embayed marsh. Creek: Shallow meandering creek with drowned valley.	Fastland: Government (unmanaged, wooded) - 10%; and residential - 90%. Shore: Occasional usage only. Creek: Lower one-half mile is a shipping harbor for Fort Eustis, no specific use above that.	Federal 10% Private 90%		Low.	Stable.	Minimal. Navigability: Dredged 17½ ft channel from James River deep water to harbor. Above harbor creek meanders, depths of 4 to 6 ft.
2 FORT EUSTIS 10.4 miles	Fastland: Low shore-83%; artificial-17%. Shore: Fringe, extensive and embayed marsh, beach. Nearshore: Intermediate to wide.	Fastland: Government. Shore: Unused, some recreational (2B). Nearshore: Reserve fleet amchorage (2C), shellfishing (2D).	Federal	Satisfactory.	Medium.	Fairly stable; moderate erosion. Groins and rubble riprap protect much of shoreline from Goose Island to Morleys Gut, but are only slightly effective.	Minimal.
3 WARWICK RIVER 18.3 miles	Fastland: Low shore-34%; moderately low shore, usually with a bluff-66%. Shore: Fringe, extensive and embayed marsh, beach, and artificial containment. Nearshore: Relatively shallow creek (3A,B); wide (3C); dredged harbor lower upper two-thirds.	Fastland: Government-42%; residemtial-57%; commercial and recreational-1%. Shore: Some recreational (3B); boat support (3D). Nearshore: recreational boating.	Federal 40% Private 58% City 2%	Intermediate.	Low to most of segment. Medium along west bank of Warwick River.	Stable over most of segment, bulkhead and groins along prison's shore. Bulkhead appears effective. Moderate along east bank of Warwick River; appears to be normal slope retreat.	Minimal, except east bank Warwick River might become more significant recreational area with improved public access and boating facilities. Navigability: Warwick River --very good for small pleasure boats. Deep Creek--good, 6½ ft deep channel and 6 ft deep turning basin.
4 HILTON-RIVERSIDE 7.2 miles	Fastland: Moderately low shore with bluff. Shore: Sand beach, embayed marsh, and artificial containment. Nearshore: Wide and intermediate.	Fastland: Residential-90%; recreational-10%. Shore: Recreational. Nearshore: Boating, fishing, shellfishing, and swimming.	Private 97% City 3%	Unsatisfactory	Low, except for increased erosion of the bluffs during storms.	Moderate (4A), bulkheads are generally effective; 2 high, long, widely spaced groins are quite effective, others are too low and permeable. No present erosion (4B), nearly continuous bulkheading is generally effective. Moderate (4C), bulkheads are quite effective, numerous small groins are only slightly, and rubble riprap at River Road and Huntington Park in ineffective.	Recreational aspects could be improved by creation of better beaches (4A), artificial beach nourishment in 2 places (4B), and cosmetic actions and proper protection of the bluff at Huntington Park (4C).
5 NEWPORT NEWS 4.1 miles	Fastland: Artificial-80%; moderately low shore with bluff-20%. Shore: Artificial-80%; narrow, thin sand beach-20%. Nearshore: Narrow to intermediate; and dredged harbor.	Fastland: Industrial-80%; recreational-5%; commercial-15%. Shore: Industrial-80%; recreational-10%; boat dockage-8%; commercial-2%. Nearshore: Shipping amd shipbuilding (5A), boating (5D).	Private 90% City 10%	Unsatisfactory	Medium to low.	Stable.	None, except Christopher Newport Park where park area and utility could be increased by improved access and better grooming of bluff.
6 HAMPTON ROADS 2.2 miles	Fastland: Low shore. Shore: Artificial containment, fringe and embayed marsh, and beach. Nearshore: Narrow to wide. Lower portion is artificial boat basin, upper portion is a meandering stream.	Fastland: Recreational-30%; residential-60%; industrial-10%. Shore: Recreation. Nearshore: Boating amd fishing.	Private 70% City 30%	Unsatisfactory	Medium to high.	Generally satisfactory. Moderate erosion from Newport News Point to Salters Creek. Groins and construction rubble riprap around Anderson Park area are only partially effective. Seawalls and bulkheads along entire segment are effective in proportion to their repair. Jetties and riprap in the Salters Creek area of moderate effectiveness. North Salters Creek has an excellent stone and concrete seawall.	Newport News Point use is dependent upon the third Hampton Bridge tunnel. Possibility of creating beach at Lincoln Park. The city of Newport News is working to improve the Salters Creek Park and Marina would greatly enhance the potential of this segment. Navigability: Salters Creek--approaches are open and clear, inlet is stabilized by jetties, size of craft limited by narrow, low highway bridge.

SHORELINE SITUATION REPORT SUBSEGMENT SUMMARY FOR NEWPORT NEWS, VIRGINIA

SUBSEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	ZONING	FLOOD HAZARD	WATER QUALITY	SHORE EROSION SITUATION			POTENTIAL USE ENHANCEMENT
							RATE	STRUCTURES	SUGGESTED ACTION	
1 Skiffes Creek 21,000 feet (4 mi.)	Fastland: Moderately low shore with bluff. Shore: Fringe and embayed marsh. Creek: Shallow meandering creek, with drowned valley.	Fastland: Government (unmanaged, wooded) - 10%; and residential. Shore: Occasional usage only. Creek: Lower one-half mile is a shipping marker for Fort Eustis, no specific creek use above that.	Private 90% Federal 10%	Residential and industrial	Low.		None.	Piers and sheet pile bulkheads in harbor.	None.	Minimal.
2A Goose Island 6,000 feet (1.1 mi.)	Fastland: Low, artificial shore. Shore: Alternating fringe marsh. Nearshore: Intermediate width.	Fastland: Government, federal, Fort Eustis (unmanaged, wooded). Shore: Unused. Nearshore: Skiffes Creek channel.	Federal	Residential	Medium.	Satisfactory.	Slight erosion.	None.	None.	Minimal.
2B Goose Island to Morleys Gut 11,000 feet (2.1 mi.)	Fastland: Low shore and artificial. Shore: Fringe and embayed marsh and beach. Nearshore: Wide.	Fastland: Government, federal, Fort Eustis. Shore: Some recreation. Nearshore: Skiffes Creek channel.	Federal	Residen-	Medium.	Satisfactory.	Moderate erosion.	Rubble riprap and groins of low effectiveness.	Artificial nourishment of the beaches.	Minimal.
2C Morleys Gut to Mulberry Point 4,800 feet (0.9 mi.)	Fastland: Low shore. Shore: Fringe and extensive marsh. Nearshore: Intermediate width.	Fastland: Government, federal, Fort Eustis. Shore: Unused. Nearshore: Reserve fleet anchorage.	Federal	Residential	Medium.	Satisfactory.	Moderate erosion. 1 to 2½ ft/year	None.	Best left as a natural area.	Minimal.
2D Mulberry Point to Curtis Point 33,000 feet (6.3 mi.)	Fastland: Low shore. Shore: Beach, fringe and extensive marsh. Nearshore: Wide.	Fastland: Government, federal, Fort Eustis (unmanaged, wooded). Shore: Unused. Nearshore: Shellfishing.	Federal	Residential	Medium.	Satisfactory.	Moderate erosion. 1 to 2 ft/yr.	None	None.	Minimal.
3A Warwick River, West Bank 46,000 feet (8.7 mi.)	Fastland: Low shore and moderately low shore. Shore: Fringe, extensive and embayed marsh. Nearshore: Relatively narrow creek.	Fastland: Government, federal, Fort Eustis (unmanaged, wooded). Shore: Unused. Nearshore: Recreational boating.	Federal	Residential	Medium.	Intermediate.	None	None.	None.	Minimal.
3B Warwick River East Bank 45,000 feet (8.5 mi.)	Fastland: Low shore and moderately low shore, usually with bluff. Shore: Fringe, extensive and embayed marsh. Nearshore: Relatively shallow creek.	Fastland: Residential. Shore: Some recreation. Nearshore: Recreational boating	Private	Residential	Low.	Intermediate.	Moderate erosion. under 2 ft/yr	Some private piers	None.	Improved access to the river would increase its recreational potential.
3C Warwick River Menchville 5,800 feet (1.1 mi.)	Fastland: Moderately low shore, usually with bluff. Shore: Mostly fringe marsh and some beach. Nearshore: Wide.	Fastland: Residential and government. Shore: Incidental. Nearshore: Recreational boating.	Private and City	Residential	Low.	Intermediate.	None	Bulkhead, effective, and groins.	None.	Minimal.
3D Deep Creek 2,700 feet (0.5 mi.)	Fastland: Moderately low shore, sometimes with bluff. Shore: Fringe marsh and artificially stabilized. Creek: Dredged harbor.	Fastland: Commercial, recreational and residential. Shore: Boat support. Creek: Boating.	Private and City	Light Industry	Low.	Intermediate.	None	Bulkheading (utility), piers, boat ramp.	None.	Minimal.
4A Deep Creek to Indigo Lake 11,000 feet (2.2 mi.)	Fastland: Moderately low shore with bluff. Shore: Narrow sand beach and embayed marsh. Nearshore: Wide, hard bottom.	Fastland: Residential. Shore: Private recreation. Nearshore: Boating, fishing and shellfishing. Deep Creek Channel parallels a section of the shoreline.	Private	Residential	Low.	Unsatisfactory.	Moderate erosion.	Seawalls, bulkheading and groins, quite effective. Piers and dock.	Complete bulkheading of bluff areas or a properly designed groin field.	The creation of better beaches would improve the recreational aspects of the beach.
4B Indigo Lake to Lake Maury 8,900 feet (1.7 mi.)	Fastland: Moderately low shore with bluff. Shore: Sand beach and artificial containment. Nearshore: Wide, hard bottom.	Fastland: Residential and recreational. Shore: Private recreation. Nearshore: Boating, fishing, and shellfishing	Private	Residential	Very Low.	Unsatisfactory.	None.	Bulkheading, generally effective; some groins and riprap. Piers, docks and boathouses.	Some repair to seawalls.	Artificial beach nourishment to existing beaches.

SHORELINE SITUATION REPORT SUBSEGMENT SUMMARY FOR NEWPORT NEWS, VIRGINIA

SUBSEGMENT	SHORELANDS TYPE	SHORELANDS USE	OWNERSHIP	ZONING	FLOOD HAZARD	WATER QUALITY	SHORE EROSION SITUATION			POTENTIAL USE ENHANCEMENT
							RATE	STRUCTURES	SUGGESTED ACTION	
4C Lake Maury South 17,400 feet (3.3 mi.)	Fastland: Moderately low shore with bluff. Shore: Sand beach and artificial containments. Nearshore: Wide and intermediate.	Fastland: Residential and recreational. Shore: Recreational. Nearshore: Fishing, shellfishing, boating and some swimming.	Private 85% City 15%	Residential	Low.	Unsatisfactory	Moderate erosion	Generally effective bulkheads and seawalls, groins of slight effectiveness, useless rubble riprap. Two fishing piers and the James River Bridge.	Use of proper stone riprap in place of the rubble. Also, full size groins might serve to widen the beach.	Cosmetic actions and proper protection of the bluff at Huntington Park could make for a much improved shore park.
5A Shipyard Extension 3,900 feet (0.7 mi.)	Fastland: Artificial. Moderately low shore with bluff. Shore: None. Nearshore: Intermediate width, muddy.	Fastland: Industrial. Shore: Industrial. Nearshore: Shipping and shipbuilding.	Private	Industrial		Unsatisfactory	None	The area is being filled and bulkheading will be emplaced to protect the fill.	None	None
5B Shipyard 17,000 feet (3.2 mi.)	Fastland: Artificial. Shore: Artificial. Nearshore: None.	Fastland: Industrial. Shore: Shipping and shipbuilding. Nearshore: Unused	Private	Industrial	Low.	Unsatisfactory	None	Piers, docks, and bulkheads.	None	None
5C Christopher Newport Park 1,350 feet (0.25 mi.)	Fastland: Moderately low shore with bluff. Shore: Narrow, thin sand beach. Nearshore: Very narrow.	Fastland: Recreational and some commercial. Shore: Some recreation. Nearshore: None.	City and Private	Commercial	Low.	Unsatisfactory	None	Large piers and a stairway down the bluff.	None	The park area and utility
5D Small Boat Harbor 3,500 feet (0.6 mi.)	Fastland: Artificial fill. Shore: Artificially stabilized. Nearshore: A dredged harbor.	Fastland: Commercial and light industrial and Hampton sewage. Shore: Boat dockage, commercial. Nearshore: Boating.	City	Industrial	Medium to Low.	Unsatisfactory	None	None	None	Minimal
6A Newport News to Salters Creek 8,100 feet (1.5 mi.)	Fastland: Low shore. Shore: Beach and artificial fill or containment. Nearshore: Narrow to Intermediate.	Fastland: Residential, industrial, and recreational. Shore: Recreation. Nearshore: Boating.	Private and City	Industrial and Residential	Medium to High.	Unsatisfactory	Moderate erosion	400 ft. steel & plank groin. Part of Anderson Park area has been filled and/or repropped. Tip of point is riprapped and filled. Seawalls and bulkheads.	Anderson Park area should be bulkheaded or riprapped with large carefully placed stone. VMRC bulkhead should be toed into land and backfilled.	Dependant upon the Hampton Roads Bridge Tunnel. Creating a fine beach at Lincoln Park and the plans of the City Park Dept. for modification of the Salters Creek and Anderson Park area would greatly enhance the potential of this subsegment.
6B Salters Creek 300,000 sq. ft.	Fastland: Low shore. Shore: Artificial containment and fringe and embayed marsh. Creek: Lower portion is an artificial boat basin, upper portion is a meandering stream.	Fastland: Recreational and residential. Shore: Recreation. Creek: Boating and fishing.	City and Private	Residential	Medium to High.	Unsatisfactory	None	Dumped concrete-slab riprap of moderate effectiveness. Rubble jetties each side of entrance, highway bridge, docks and bulkheads within the boat basin.	Implementation of the parks plan, includes improved bulkheading and a revised boat harbor.	City plan for expansion and revitalization of park area is an excellent plan for improvement.
6C Salters Creek North 3,600 feet (0.7 mi.)	Fastland: Low shore. Shore: Artificial. Nearshore: Wide, hard bottom.	Fastland: Residential. Shore: Recreation, at low tide. Nearshore: Fishing and boating.	Private	Residential	Medium.	Unsatisfactory	None	Excellent stone seawall. Storm drain outfalls and 2 stairways down the face of the seawall.	None	Minimal.

4.2 SEGMENT AND SUBSEGMENT DESCRIPTIONS

SKIFFES CREEK, NEWPORT NEWS, VIRGINIA

SEGMENT 1 (Maps 2A, 2B, 2C)

EXTENT: 21,000 feet (4 mi.) from the Fort Eustis Harbor to the Skiffes Creek Reservoir.

SHORELANDS TYPE
FASTLAND: Moderately low shore with bluff.
SHORE: Fringe and embayed marsh.
CREEK: Shallow meandering creek, with drowned valley.

SHORELANDS USE
FASTLAND: Government (unmanaged, wooded) - 10% and residential.
SHORE: Occasional usage only.
CREEK: Lower one-half mile is a shipping harbor for Fort Eustis, no specific creek use above that.

OWNERSHIP: Federal, Fort Eustis - 10%, private - 90%.

ZONING: Residential and industrial.

FLOOD HAZARD: Low.

WATER QUALITY: No data available.

SHORE EROSION SITUATION: Stable.
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

OTHER SHORE STRUCTURES: There are numerous piers and sheet pile bulkheads in the harbor.

NAVIGABILITY: A dredged 17½-foot channel extends from James River deep water to the Fort Eustis harbor. Above the harbor Skiffes Creek meanders and appears to have depths of 4 to 6 feet.

POTENTIAL USE ENHANCEMENT: Minimal. Because the creek is so narrow and shallow and the mouth is a busy harbor, the opportunities for possible recreational use are small.

MAPS: USGS, 7.5 Min.Ser. (Topo.), YORKTOWN Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 110 162, 183.
NASA 31Oct71 7046, 7047.
VIMS 27Oct72 NN-1 1;
VIMS 30Apr73 NN-1 142-170, 178-181.

Ground - VIMS 23May73 NN-1 1-13.

GOOSE ISLAND, NEWPORT NEWS, VIRGINIA

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

EXTENT: 6,000 feet (1.1 mi.) around the Goose Island Peninsula.

SHORELANDS TYPE
FASTLAND: Low, artificial shore (the Goose Island Peninsula is composed of dredge spoil).
SHORE: Alternating fringe marsh and beach.
NEARSHORE: Intermediate width.

SHORELANDS USE
FASTLAND: Federal government, Fort Eustis (unmanaged, wooded).
SHORE: Unused.
NEARSHORE: Skiffes Creek Channel.

WIND AND SEA EXPOSURE: Goose Island is a peninsula protruding westward into the James River. Fetches are:

NW 5 nm
W 2
SW 4

OWNERSHIP: Federal.

ZONING: Residential.

FLOOD HAZARD: Medium, noncritical.

WATER QUALITY: No data.

BEACH QUALITY: No beaches.

SHORE EROSION SITUATION: Goose Island is an artificial peninsula of dredge spoil. While there may be local areas of shoreline retreat, overall erosion is difficult to judge and not particularly significant.
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), YORKTOWN Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 162, 183, 184;
USDA 310ct53 DWJ 161, 187.
VaDH 22Feb63 5 047 122 014.
NASA 310ct71 7046, 7047, 7197.
VIMS 270ct72 NN-2A 2-3.

GOOSE ISLAND TO MORLEYS GUT, NEWPORT NEWS, VIRGINIA

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

EXTENT: 11,000 feet (2.1 mi.) from Goose Island to Morleys Gut.

SHORELANDS TYPE
FASTLAND: Low shore and artificial.
SHORE: Fringe and embayed marsh and beach.
NEARSHORE: Wide.

SHORELANDS USE
FASTLAND: Federal government (Fort Eustis and U.S. Department of Commerce).
SHORE: Some recreation.
NEARSHORE: Generally unused, some slight recreational use.

WIND AND SEA EXPOSURE: The shoreline trend is NNE - SSW. The maximum fetch is $5\frac{1}{2}$ nm to the NW.

OWNERSHIP: Federal.

ZONING: Residential.

FLOOD HAZARD: Medium. The area is quite low, commonly under 5 feet, but there is little that would be harmed by high water.

WATER QUALITY: Found satisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Fair. The beach is narrow and littered.

SHORE EROSION SITUATION
EROSION RATE: Moderate. There are attempts to control the problem with rubble riprap and groins.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: Groins and rubble riprap protect much of the shoreline of this subsegment. Both are only slightly effective. There is very little material in longshore transport to be trapped by the groins and the material used as riprap is too small.

Suggested Action: Artificial nourishment of the groined beaches might stem the erosion problem.

OTHER SHORE STRUCTURES: Several small (fishing ?) piers.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), YORKTOWN Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 161, 162, 183, 184;
USDA 310ct53 DWJ-4N 161, 186, 187.
VaDH 22Feb63 5 047 122 014-016.
NASA 310ct71 7046, 7047, 7197.
VIMS 270ct72 NN-2B 4-17;
VIMS 30Apr73 NN-2B 171-177.

Ground - VIMS 23May73 NN-2B 14-27.

MORLEYS GUT TO MULBERRY POINT, NEWPORT NEWS, VIRGINIA

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

EXTENT: 4,800 feet (0.9 mi.) from Morleys Gut to Mulberry Point.

SHORELANDS TYPE
FASTLAND: Low shore.
SHORE: Fringe and extensive marsh.
NEARSHORE: Intermediate width.

SHORELANDS USE
FASTLAND: Federal government (Fort Eustis).
SHORE: Unused.
NEARSHORE: Reserve fleet anchorage.

WIND AND SEA EXPOSURE: The shoreline trend is NE - SW.
Fetches are:

NNW	6 nm
NW	2 nm through the reserve fleet
W	2 nm through the reserve fleet.

OWNERSHIP: Federal.

ZONING: Residential.

FLOOD HAZARD: Medium, but there is little, if anything, that would be harmed by high water.

WATER QUALITY: Found satisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: There are no beaches in this subsegment.

SHORE EROSION SITUATION
EROSION RATE: Moderate. The shoreline of this subsegment generally is retreating at 1 to 2½ feet per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: The subsegment is best left alone as a natural area.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), YORKTOWN Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 161, 162, 184-186;
USDA 310ct53 DWJ-4N 187-189.
VaDH 22Feb63 5 047 122 015-017.
NASA 310ct71 7046, 7047.
VIMS 270ct72 NN-2C 18-22.

MULBERRY POINT TO CURTIS POINT,

NEWPORT NEWS, VIRGINIA

SUBSEGMENT 2D (Maps 2A, 2B, 2C and 3A, 3B, 3C)

EXTENT: 33,000 feet (6.3 mi.) along the Mulberry Island shoreline from Mulberry Point to Curtis Point.

SHORELANDS TYPE
FASTLAND: Low shore.
SHORE: Beach and fringe and extensive marsh.
NEARSHORE: Wide.

SHORELANDS USE
FASTLAND: Federal government (Fort Eustis - unmanaged, wooded).
SHORE: Unused.
NEARSHORE: Shellfishing.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SW.
Fetches are:
SW 5 nm
S 4 nm.

OWNERSHIP: Federal.

ZONING: Residential.

FLOOD HAZARD: Medium. The area is quite low, but there are no structures that would be endangered by high water.

WATER QUALITY: Found satisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Poor. The beach is thin and narrow.

SHORE EROSION SITUATION: Fairly stable.
EROSION RATE: Moderate. There is a general 1 to 2-foot per year retreat.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 77-79, 159-161, 185, 186;
USDA 310ct53 DWJ-4N 152, 157, 159, 188, 189, 192.
VaDH 200ct59 5 121 059 126;
VaDH 22Feb63 5 047 122 015-018; 5 121 120 078-080, 114-116, 126, 127.
VIMS 270ct72 NN-2D 23-57.

WARWICK RIVER, WEST BANK, NEWPORT NEWS, VIRGINIA

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

EXTENT: 46,000 feet (8.7 mi.) from Curtis Point on Mulberry Island.

SHORELANDS TYPE
FASTLAND: Low shore and moderately low shore.
SHORE: Fringe, extensive, and embayed marsh.
NEARSHORE: Relatively shallow creek.

SHORELANDS USE
FASTLAND: Federal government (Fort Eustis - unmanaged, wooded).
SHORE: Unused.
NEARSHORE: Recreational boating.

WIND AND SEA EXPOSURE: Very limited. Only winds blowing across or up the Warwick River generate waves that reach this shore.

OWNERSHIP: Federal.

ZONING: Residential.

FLOOD HAZARD: Medium. Most of the area is below 10 feet, but there are few, if any, structures to be damaged by high water.

WATER QUALITY: Found intermediate by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: There are no beaches in this subsegment.

SHORE EROSION SITUATION: The shoreline is stable.
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

NAVIGABILITY: Very good for small pleasure boats.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 52-54, 75, 77-79;
USDA 310ct53 DWJ-4N 152.
VaDH 200ct59 5 121 059 125;
VaDH 22Feb63 5 121 120 114, 115, 127.
NASA 310ct71 7046-7048, 7198.
VIMS 270ct72 NN-3A 58, 59;
VIMS 30Apr73 NN-3A 182-239.

WARWICK RIVER, EAST BANK, NEWPORT NEWS, VIRGINIA

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

EXTENT: 45,000 feet (8.5 mi.) from the marsh point just north of the "Young" triangulation station.

SHORELANDS TYPE
FASTLAND: Low shore, and moderately low shore, usually with a bluff.
SHORE: Fringe, extensive, and embayed marsh.
NEARSHORE: Relatively shallow creek.

SHORELANDS USE
FASTLAND: Residential.
SHORE: Some recreational use.
NEARSHORE: Recreational boating.

WIND AND SEA EXPOSURE: Very limited.

OWNERSHIP: Private.

ZONING: Residential.

FLOOD HAZARD: Low. Most of the area is above 20 feet.

WATER QUALITY: Found intermediate by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: There are no beaches in this subsegment.

SHORE EROSION SITUATION
EROSION RATE: Moderate. The erosion rate is under 2 feet per year and appears normal downslope erosion slightly accelerated by the Warwick River.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: Some private piers.

NAVIGABILITY: Very good for small pleasure boats.

POTENTIAL USE ENHANCEMENT: Improved public access and boat launching and docking facilities might make the Warwick River a more significant recreational area.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 52-54, 75, 77-79;
USDA 310ct53 DWJ-4N 124, 152, 157, 159.
VaDH 5Sep58 4 121 012 148;
VaDH 200ct59 5 121 059 126;
VaDH 22Feb63 5 121 120 114, 127.
NASA 310ct71 7046-7049, 7198.
VIMS 270ct72 NN-3B 59;
VIMS 30Apr73 NN-3B 182-293; NN-3B 240-264.

Ground - VIMS 7May73 NN-3B 28-32.

WARWICK RIVER, MENCHVILLE, NEWPORT NEWS, VIRGINIA

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

EXTENT: 5,800 feet (1.1 mi.) from Deep Creek to the marsh point north of the "Young" triangulation station, east of Menchville.

SHORELANDS TYPE
FASTLAND: Moderately low shore, usually with bluff.
SHORE: Mostly fringe marsh, some beach.
NEARSHORE: Wide, mouth of the Warwick River.

SHORELANDS USE
FASTLAND: Residential (rural) and government (sewage treatment plant, prison farm).
SHORE: Occasional use only.
NEARSHORE: Recreational boating.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SW.
Fetches are:
SW 4 nm
S 5 nm.
Mulberry Island (Fort Eustis) shields the area from west and northwest winds and waves.

OWNERSHIP: Private and City.

ZONING: Residential.

FLOOD HAZARD: Low. Most of the area is above 20 feet.

WATER QUALITY: Found intermediate by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Poor. What little beach there is, is thin and narrow.

SHORE EROSION SITUATION
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: Bulkhead and groins along the prison's shore. The bulkhead appears effective in combatting the local erosion.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 52-54, 77-79;
USDA 15Aug37 FG 140 170;
USDA 310ct53 DWJ-4N 124, 159, 161.
VaDH 5Sep58 5 121 012 148;
VaDH 200ct59 5 121 059 126, 128;
VaDH 22Feb63 5 121 120 126, 127.
VIMS 270ct72 NN-3C 60-63;
VIMS 30Apr73 NN-3C 265-272.

DEEP CREEK, NEWPORT NEWS, VIRGINIA

SUBSEGMENT 3D (Maps 3A, 3B, 3C)

EXTENT: 2,700 feet from the inlet's entrance to a point just above the Warwick Yacht Club. The creek extends roughly 1 mile farther inland as a shallow, tidal marsh creek.

SHORELANDS TYPE
FASTLAND: Moderately low shore, sometimes with bluff.
SHORE: Fringe marsh and artificially stabilized.
CREEK: A dredged harbor in the lower 2,700 feet; shallow, tidal creek in the upper mile.

SHORELANDS USE
FASTLAND: Commercial, support facilities for the local oyster fleet and for an extensive pleasure boat fleet; also recreational (Warwick Yacht Club) and residential.
SHORE: Boat support.
CREEK: Boating.

OWNERSHIP: Private and City.

ZONING: Light industry.

FLOOD HAZARD: Low. Most of the area is above 10 feet.

WATER QUALITY: Found intermediate by the State Shellfish Sanitation Commission as of July 1973.

SHORE EROSION SITUATION: Stable.
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: Most of the lower part of the creek is bulkheaded, which would fall into the "utility" class as it is used as dock space for the various marinas. Also, there are piers and a boat-launching ramp.

NAVIGABILITY: Good. There is a maintained 6½-foot deep channel and a 6-foot turning basin.

POTENTIAL USE ENHANCEMENT: Minimal, as existing uses and population pressure would make significant alteration very difficult.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 52-54;
USDA 23Jun37 FG 136 22;
USDA 15Aug37 FG 140 170;
USDA 31Oct53 DWJ-4N 124.
VaDH 5Sep58 5 121 012 148;
VaDH 22Feb63 5 121 120 126, 127.
NASA 31Oct71 7048, 7049, 7198.
VIMS 30Apr73 NN-3D 273-293.

Ground - VIMS 3Apr73 NN-3D 33-36;
VIMS 7May73 NN-3D 37-62.

DEEP CREEK TO INDIGO LAKE, NEWPORT NEWS, VIRGINIA

SUBSEGMENT 4A (Maps 3A, 3B, 3C)

EXTENT: 11,000 feet (2.2 mi.) from Deep Creek inlet to Indigo Lake.

SHORELANDS TYPE
FASTLAND: Moderately low shore with bluff.
SHORE: Narrow, sandy beach and embayed marsh.
NEARSHORE: Wide, hard bottom.

SHORELANDS USE
FASTLAND: Residential (suburban).
SHORE: Private recreation.
NEARSHORE: Boating, fishing, and shellfishing. The Deep Creek channel parallels a section of the shoreline.

OFFSHORE: James River Channel.

WIND AND SEA EXPOSURE: The shoreline trend varies from N - S to NW - SE.
Fetches from Blunt Point are:

S 4½ nm
SW 3½ nm
W 6½ nm
NW 6½ nm.

OWNERSHIP: Private.

ZONING: Residential.

FLOOD HAZARD: Low, except for temporary increases of erosion as a result of high water levels along the bluffs.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Generally fair; very good in the area built up by 2 large groins.

SHORE EROSION SITUATION
EROSION RATE: Moderate.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: About half the subsegment is protected by seawalls or bulkheads which are generally effective. However, in most cases it would have been beneficial to use deeper footings in order to prevent undercutting.

Two high, long and widely spaced groins (Figures 9 and 11) are quite effective and successful in trapping sand and building a good beach. The majority of the other groins are half-hearted affairs of rubble, concrete blocks or "beach rock" (iron-cemented sand from the bluffs) and generally are too low and too permeable to be significantly effective.

Suggested Action: Complete bulkheading of the bluff areas or a properly designed groin-field, working as the 2 successful groins now do, are the most probably successful methods of protecting the bluff. The landscaped or terraced bluff behind the seawall, in some locations, appears to be a fine, although expensive, method of shore protection.

OTHER SHORE STRUCTURES: There are several small piers and docks.

POTENTIAL USE ENHANCEMENT: The creation of better beaches would improve the recreational aspects of the shoreline.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 21, 22, 51, 52;
USDA 15Aug37 FG 140 168-170;
USDA 310ct53 DWJ-4N 122, 124.
VaDH 5Sep58 5 121 012 144;
VaDH 200ct59 5 121 059 128;
VaDH 22Feb63 5 121 120 124-127, 157, 158.
VIMS 270ct72 NN-4A 66-76.

Ground - VIMS 10Apr73 NN-4A 63-130.

INDIGO LAKE TO LAKE MAURY, NEWPORT NEWS, VIRGINIA

SUBSEGMENT 4B (Maps 4A, 4B, 4C)

EXTENT: 8,900 feet (1.7 mi.) from the mouth of Indigo Lake to the mouth of Lake Maury.

SHORELANDS TYPE
FASTLAND: Moderately low shore with bluff.
SHORE: Sand beach and artificial containment.
NEARSHORE: Wide, hard bottom.

SHORELANDS USE
FASTLAND: Residential (suburban) and recreational.
SHORE: Private recreation.
NEARSHORE: Boating, fishing, and shellfishing.

OFFSHORE: James River Channel.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SW.
Fetches are:

S 4½ nm across the James River
SW 3½ nm across the James River
W 7 nm across the James River
NW 8 nm up the James River.

OWNERSHIP: Private.

ZONING: Residential.

FLOOD HAZARD: Very low.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Fair to poor. Generally artificial seawall with very little beach below.

SHORE EROSION SITUATION: Under control.
EROSION RATE: None at present, historically the rate has been less than 1 foot per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: Nearly continous bulkheading that is generally effective; some groins and riprap.

Suggested Action: Some repairs to the seawalls.

OTHER SHORE STRUCTURES: There are piers, docks,

and boathouses.

POTENTIAL USE ENHANCEMENT: Artificial beach nourishment at the Merry Point Association beach and at the reentrant in the seawall would improve the recreational aspects of the subsegment.

MAPS: USGS, 7.5 Min.Ser. (Topo.), MULBERRY ISLAND Quadr., 1965, photorevised 1970, and NEWPORT NEWS NORTH Quadr., 1965, photorevised 1970. C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 23Jun37 FG 136 24;
USDA 15Aug37 FG 140 168-170;
USDA 310ct53 DWJ-4N 117, 127.
VaDH 5Sep58 5 121 012 143, 144;
VaDH 22Feb63 5 121 120 157, 159;
VaDH 18Mar66 5 121 212 047.
VIMS 270ct72 NN-4B 77-86.

Ground - VIMS 16Apr73 NN-4B 131-157.

LAKE MAURY SOUTH, NEWPORT NEWS, VIRGINIA

SUBSEGMENT 4C (Maps 4A, 4B, 4C)

EXTENT: 17,400 feet (3.3 mi.) from the Lake Maury outfall to the intersection of Huntington Avenue and River Road.

SHORELANDS TYPE
FASTLAND: Moderately low shore with bluff.
SHORE: Sand beach and artificial containment.
NEARSHORE: Wide and intermediate.

SHORELANDS USE
FASTLAND: Residential (urban) and recreational (Huntington Park).
SHORE: Recreational.
NEARSHORE: Fishing, shellfishing, boating and some swimming.

OFFSHORE: James River Channel.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SE.
Fetches are:

S	8	nm
SW	$3\frac{1}{2}$	nm across the James River
W	$4\frac{1}{2}$	nm
NW	11	nm up the James River.

OWNERSHIP: Private - 85%; City - 15%.

ZONING: Residential.

FLOOD HAZARD: Low, except for temporary increases of erosion as a result of high water levels along the bluffs.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Generally poor, except that Huntington Park is fair.

SHORE EROSION SITUATION
EROSION RATE: Moderate.
ENDANGERED STRUCTURES: A portion of River Road near Huntington Avenue is endangered.
SHORE PROTECTIVE STRUCTURES: Much of the northern part of the subsegment is protected by bulkheads or seawalls. These structures are generally quite effective. There are numerous small groins of slight effectiveness. The bluff at Huntington Park and the problem area on River Road are "protected" by a nearly useless rubble riprap.

Suggested Action: The use of proper stone riprap in place of the rubble. Also, where there is a nearshore sediment supply, full size groins might serve to widen the beach.

OTHER SHORE STRUCTURES: There are two fishing piers and the James River Bridge.

POTENTIAL USE ENHANCEMENT: Cosmetic actions and proper protection of the bluff at Huntington Park could make for a much improved shore park.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS NORTH Quadr., 1965, photorevised 1970. C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 20-22;
USDA 23Jun37 FG 136 26;
USDA 310ct53 DWJ-4N 84, 86, 117.
VaDH 5Sep53 5 121 012 158-160;
VaDH 22Feb63 5 121 120 168, 169, 204, 205.
USGS 30Mar63 2-226.
VaDH 18Mar66 5 121 212 031, 047, 064.
VIMS 270ct72 NN-4C 87-107.

Ground - VIMS 15Feb73 NN-4C 158-169;
VIMS 16Apr73 NN-4C 170-205.

SHIPYARD EXTENTION, NEWPORT NEWS, VIRGINIA

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

EXTENT: 3,900 feet (0.7 mi.) from the intersection of Huntington Avenue and River Road to the Newport News Shipbuilding and Drydock Company.

SHORELANDS TYPE
FASTLAND: Artificial moderately low shore with bluff.
SHORE: None.
NEARSHORE: Intermediate width, muddy.

SHORELANDS USE
FASTLAND: Industrial.
SHORE: Industrial.
NEARSHORE: Shipping and shipbuilding.

OFFSHORE: James River Channel.

WIND AND SEA EXPOSURE: The shoreline trend is NW - SE.
Fetches are:

NW	12 nm
W	5½ nm
SW	3½ nm
S	5½ nm.

OWNERSHIP: Private.

ZONING: Industrial.

FLOOD HAZARD:

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: There are no beaches in this subsegment.

SHORE EROSION SITUATION
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: The area is being filled and bulkheading will be emplaced to protect the fill.

Suggested Action: None.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: None.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS NORTH Quadr., 1965, photorevised 1970, and NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 14, 15.
VaDH 5Sep58 5 121 012 157, 158;
VaDH 22Feb63 5 121 120 204, 205.
USGS 30Mar63 2-170.
VaDH 18Mar66 5 121 212 016.
NASA 31Oct71 7170.
VIMS 27Oct72 NN-5B 108-110.

Ground - VIMS 15Feb73 NN-5A 206-208.

SHIPYARD, NEWPORT NEWS VIRGINIA

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

EXTENT: 17,000 feet (3.2 mi.) running from Newport News Point to the beginning of the 1973 shipyard extention; excluding the shoreline in subsegment 5C (Christopher Newport Park shore).

SHORELANDS TYPE
FASTLAND: Artificial.
SHORE: Artificial.
NEARSHORE: None.

SHORELANDS USE
FASTLAND: Industrial (shipyard, coal yard).
SHORE: Shipping and shipbuilding.
NEARSHORE: Unused.

OFFSHORE: Shipping.

WIND AND SEA EXPOSURE: The shoreline trend is NNW - SSE.
Fetches are:

S	4½ nm
W	4 nm
NW	13 nm.

OWNERSHIP: Private.

ZONING: Industrial.

FLOOD HAZARD: Low.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: There are no beaches in this subsegment.

SHORE EROSION SITUATION: Stable.
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are numerous piers, docks and bulkheads associated with the shipyards and coal yards.

POTENTIAL USE ENHANCEMENT: None.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 15-17;
USDA 31Oct53 DWJ-4N 75, 77, 78, 80-82, 84.
VaDH 4Sep58 5 121 012 096, 097;
VaDH 5Sep58 5 121 012 155-158;
VaDH 22Feb63 5 121 120 205-208, 217, 218.
USGS 30Mar63 2-170.
NASA 31Oct71 7170.
VIMS 27Oct72 NN-5B 111-115, 118-123.

Ground - VIMS 15Feb73 NN-5B 209-218.

CHRISTOPHER NEWPORT PARK, NEWPORT NEWS, VIRGINIA

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

EXTENT: 1,350 feet (0.25 mi.), the nonindustrial area adjacent to Christopher Newport Park in downtown Newport News.

SHORELANDS TYPE
FASTLAND: Moderately low shore with bluff.
SHORE: Narrow, thin sand beach.
NEARSHORE: Very narrow.

SHORELANDS USE
FASTLAND: Recreational (a city park) and some commercial use.
SHORE: Some recreation.
NEARSHORE: None.

OFFSHORE: Shipping.

WIND AND SEA EXPOSURE: Similar to that of subsegment 5B, but the shoreline of this subsegment is much more shielded from the south.

OWNERSHIP: Private and City.

ZONING: Commercial.

FLOOD HAZARD: Low.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Fair. The quality of the beach is distinctly lessened by the nature of the James River in the area.

SHORE EROSION SITUATION: Stable.
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None, but the area is protected on either side by large piers.

Suggested Action: None.

OTHER SHORE STRUCTURES: There is a stairway down the bluff at the northern edge of the subsegment.

POTENTIAL USE ENHANCEMENT: The park area and utility perhaps could be increased by improving access down the bluff to the water and by better grooming of the bluff.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 17Apr37 FG 110 15-17;
USDA 31Oct53 DWJ-4N 77, 81, 82.
VaDH 4Sep58 5 121 012 96, 97;
VaDH 5Sep58 5 121 012 124, 125, 155;
VaDH 18Mar66 5 121 212 001, 016.
USGS 30Mar63 2-170.
NASA 31Oct71 7170.
VIMS 27Oct72 NN-5C 116, 117.

Ground - VIMS 20Mar73 NN-5C 219-221.

SMALL BOAT HARBOR, NEWPORT NEWS, VIRGINIA

SUBSEGMENT 5D (Maps 5A, 5B, 5C)

EXTENT: This subsegment is an artificial boat harbor 3,500 feet (0.6 mi.) long.

SHORELANDS TYPE
FASTLAND: Artificial fill.
SHORE: Artificially stabilized.
NEARSHORE: A dredged harbor.

SHORELANDS USE
FASTLAND: Commercial and light industrial uses associated with the boat harbor and the Hampton Roads Sewage District treatment plant.
SHORE: Boat dockage and commercial.
NEARSHORE: Boating.

OWNERSHIP: City.

ZONING: Industrial.

FLOOD HAZARD: Medium to low.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

SHORE EROSION SITUATION
EROSION RATE: None.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: None.

Suggested Action: None.

NAVIGABILITY: Good. An 11½-foot channel is maintained to the Newport News deep water channel. As of June 1968, the dredged harbor was 10½ feet deep and 150 feet wide.

POTENTIAL USE ENHANCEMENT: Minimal.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #529, 1:40,000 scale, JAMES RIVER, Newport News to Jamestown Island, 1972.

PHOTOS: Aerial-USDA 12Apr37 FG 108 191, 192;
USDA 17Apr37 FG 110 16, 17;
USDA 31Oct53 DWJ-4N 77, 78.
VaDH 5Sep58 5 121 012 124, 125;
VaDH 22Feb63 5 121 120 217, 218.
USGS 30Mar63 2-170.
NASA 31Oct71 7170.
VIMS 27Oct72 NN-5D 124, 125.

Ground - VIMS 15Feb73 NN-5D 228, 229;
VIMS 28Mar73 NN-5D 222-227.

NEWPORT NEWS POINT TO SALTERS CREEK,
NEWPORT NEWS, VIRGINIA
SUBSEGMENT 6A (Maps 5A, 5B, 5C)

EXTENT: 8,100 feet (1.5 mi.) from the entrance of the Newport News Small Boat Harbor to the mouth of Salters Creek.

SHORELANDS TYPE
FASTLAND: Low shore.
SHORE: Artificial fill or containment (75%) and beach (25%).
NEARSHORE: Narrow near Newport News Point grading to intermediate in the northern part of the subsegment.

SHORELANDS USE
FASTLAND: Residential with recreation (55%) and industrial (45%).
SHORE: Recreation.
NEARSHORE: Boating.

OFFSHORE: 45-foot deep, 800-foot wide Newport News Channel.

WIND AND SEA EXPOSURE: The shoreline trend is NNE - SSW. Maximum fetches to the south and east are 3 and 4 nautical miles. Some large swells may approach the area through the mouth of Hampton Roads.

OWNERSHIP: Private and City.

ZONING: Industrial in the southern half, Residential to the north.

FLOOD HAZARD: Medium to high. Much of the area is below 10 feet above mean sea level. Corps of Engineers estimates for nearby area indicate storm water levels of 9 feet are possible.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Very poor to fair. The sand fillet behind the one groin is the best beach in the area.

SHORE EROSION SITUATION
EROSION RATE: Moderate.
ENDANGERED STRUCTURES: The paved walkway along Anderson Park is endangered.
SHORE PROTECTIVE STRUCTURES: A 400-foot long steel and plank groin that was built in 1940-41. Aerial photographs indicate that the groin has been bypassing sand since 1963. This groin appears responsible for the general accretion extending approximately 3,000 feet north from the groin. Part of the Anderson Park area has been filled and/or riprapped with construction rubble. It is only partially effective and would benefit from the careful placement of larger stone. The tip of Newport News Point (roughly 650 feet) is riprapped and filled. There are several seawalls or bulkheads throughout the area that are effective in proportion to their repair.

Suggested Action: The Anderson Park area should be bulkheaded or riprapped with large carefully placed stone. The VMRC bulkhead should be toed into the fastland and probably backfilled.

OTHER SHORE STRUCTURES: None.

POTENTIAL USE ENHANCEMENT: The future of this shoreline is dependent upon the new Hampton Roads Bridge Tunnel (I-664). There is a distinct possibility of creating a fine beach at Lincoln Park. The plans of the city Park Department for the modification of Salters Creek and Anderson Park also concern this subsegment.

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #562, 1:40,000 scale, CHESAPEAKE BAY, Cape Charles to Norfolk Harbor, 1971.

PHOTOS: Aerial-USDA 12Apr37 FG 108/190-192;
USDA 17Apr37 FG 110/15-17;
USDA 310ct53 DWJ-4N/75, 77, 78.
VaDH 5Sep58 5 121 012/124, 125;
VaDH 22Feb63 5 121 120/217-219;
VaDH 23Feb63 5 114 116/023, 024.
USGS 30Mar63 2-170.
NASA 310ct71 7170.
VIMS 270ct72 NN-6A/131-134.

Ground - VIMS 15Feb73 NN-6A/270-275;
VIMS 28Mar73 NN-6A/230-269.

SALTERS CREEK, NEWPORT NEWS, VIRGINIA
SUBSEGMENT 6B (Maps 5A, 5B, 5C)

EXTENT: Approximately 300,000 square feet.

SHORELANDS TYPE
FASTLAND: Low shore.
SHORE: Artificial containment and fringe and embayed marsh.
CREEK: The lower portion of the creek is an artificial boat basin (Peterson's) while the upper portion is a meandering stream.

SHORELANDS USE
FASTLAND: Recreational and residential.
SHORE: Recreation.
CREEK: Boating and fishing.

OWNERSHIP: The boat basin is owned by the city, upper portions of the stream are privately owned, although the city is attempting to acquire more extensive ownership.

ZONING: Residential.

FLOOD HAZARD: Medium to high. Most of the area lies below 10 feet.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

SHORE EROSION SITUATION: Generally satisfactory. Some small problem between the jetties and the highway bridge.
EROSION RATE: None at present. Historically less than 2 feet per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: Concrete-slab riprap has been dumped inside the jetties. This is of moderate effectiveness only, but it does defend the particular site of erosion.

Suggested Action: See Potential Use Enhancement below.

OTHER SHORE STRUCTURES: Rubble jetties on each side of the creek mouth, a bridge between the jetties and the boat basin, various docks and bulkheads within the boat basin, a culvert connecting the boat basin to the upper portion of the Salters Creek.

NAVIGABILITY: The narrow, low highway bridge limits the size of the craft that are able to utilize the facility. The approaches are open and clear. The inlet is stabilized by jetties.

POTENTIAL USE ENHANCEMENT: The City of Newport News is working on a plan for a vastly improved Salter's Creek Park and Marina. The proposed park would include much of what is now Anderson Park in an improved beach area, would create a new boat basin outside the mouth of the present basin, and would construct a series of nature trails and bicycle trails around and through the Salter's Creek Marsh. The plan is detailed in a February 1973 report of the Newport News Department of City Planning and Community Development entitled "A Plan for Salter's Creek Park and Marina."

MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #562, 1:40,000 scale, CHESAPEAKE BAY, Cape Charles to Norfolk Harbor, 1971.

PHOTOS: Aerial-USDA 12Apr37 FG 108/190, 191;
USDA 310ct53 DWJ-4N/75, 77.
VaDH 22Feb63 5 121 120/219;
VaDH 23Feb63 5 121 116/022-024.
VIMS 270ct72 NN-6B/135, 136.

Ground - VIMS 15Feb73 NN-6B/285-291;
VIMS 28Mar73 NN-6B/276-284.

SALTERS CREEK NORTH, NEWPORT NEWS, VIRGINIA

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

EXTENT: 3,600 feet (0.7 mi.) from the mouth of Salters Creek to the Newport News - Hampton City line.

SHORELANDS TYPE
FASTLAND: Low shore.
SHORE: Artificial (seawall).
NEARSHORE: Wide, hard bottom.

SHORELANDS USE
FASTLAND: Residential (urban).
SHORE: Recreation, at low tide.
NEARSHORE: Fishing and boating.

OFFSHORE: Hampton Roads shipping industry.

WIND AND SEA EXPOSURE: The shoreline trend is NE - SW. Maximum clear fetches to the east and south are 3 and 4 nautical miles. Some larger waves may reach the shoreline from the east through the mouth of Hampton Roads.

OWNERSHIP: Private, although the access to the water is public and unrestricted.

ZONING: Residential.

FLOOD HAZARD: Medium. Most of the subsegment is below the projected Intermediate Regional Tidal Flood level (9 feet above MSL) and could be subjected to wave as well as flood damage in a severe storm.

WATER QUALITY: Found unsatisfactory by the State Shellfish Sanitation Commission as of July 1973.

BEACH QUALITY: Generally very poor. A low-tide beach only, except near Salters Creek where there is a pleasant, narrow sand beach.

SHORE EROSION SITUATION: Controlled.
EROSION RATE: None at present. Historically less than 2 feet per year.
ENDANGERED STRUCTURES: None.
SHORE PROTECTIVE STRUCTURES: The entire length of this subsegment is protected by an excellent stone and concrete seawall.

Suggested Action: None.

OTHER SHORE STRUCTURES: There are some storm drain outfalls, also two stairways down the face of the seawall.

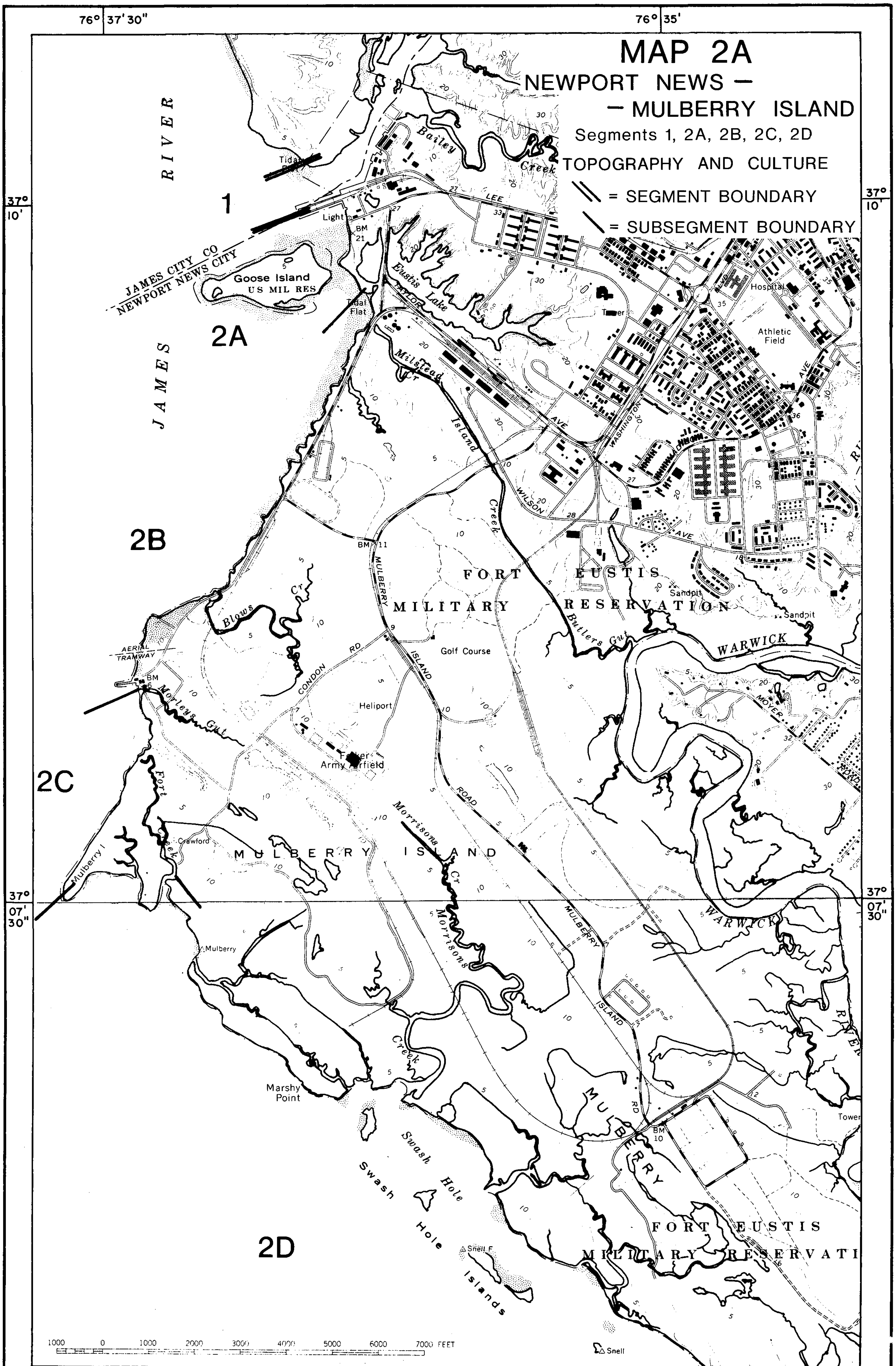
POTENTIAL USE ENHANCEMENT: Minimal, except as associated with plans for the Salter's Creek Park (see Subsegment 6B).

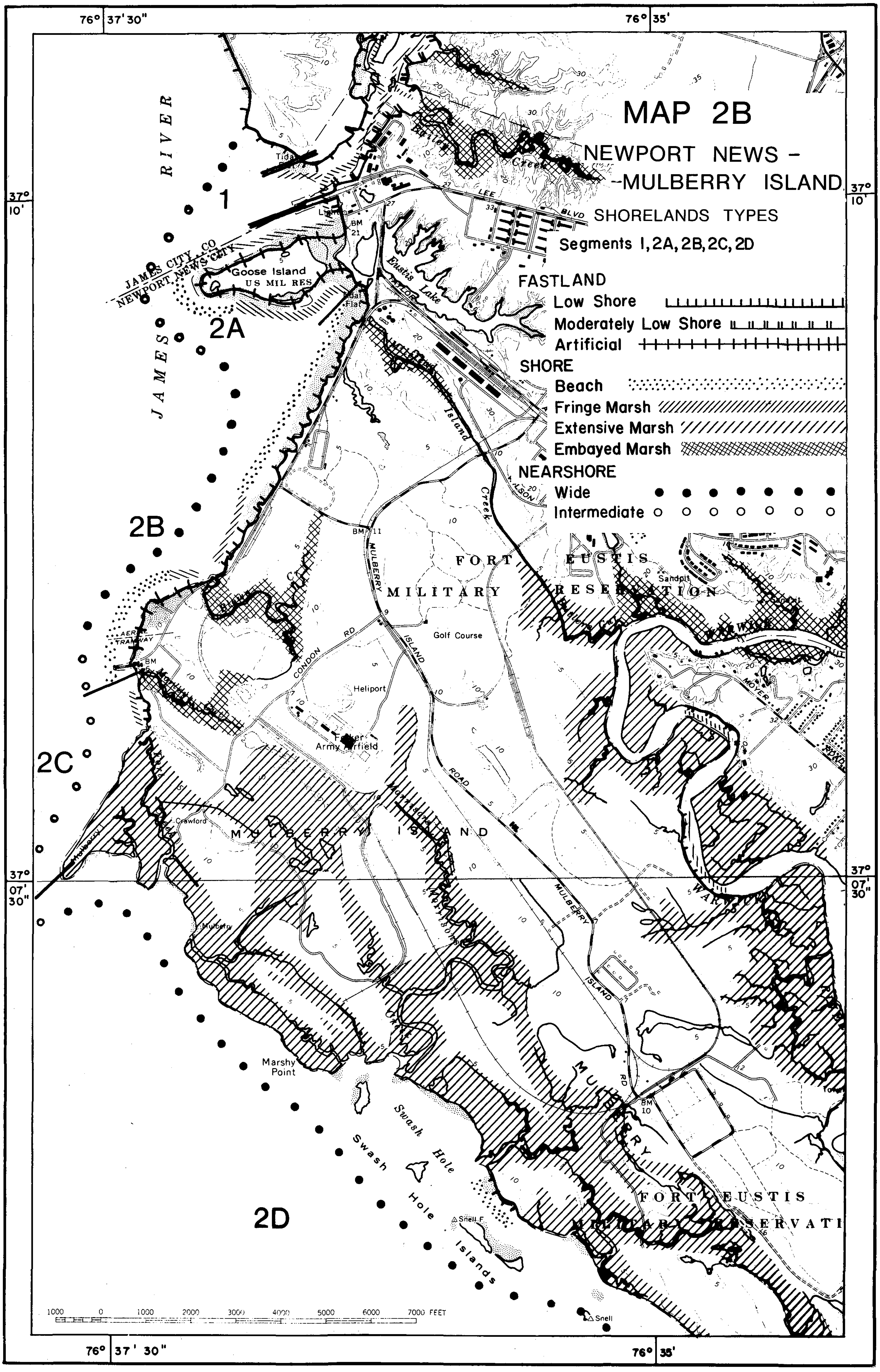
MAPS: USGS, 7.5 Min.Ser. (Topo.), NEWPORT NEWS SOUTH Quadr., 1964, photorevised 1968.
C&GS, #562, 1:40,000 scale, CHESAPEAKE BAY, Cape Charles to Norfolk Harbor, 1971.

PHOTOS: Aerial-USDA 12Apr37 FG 108/190, 191;
USDA 310ct53 DWJ-4N/75, 77.
VaDH 23Feb63 5 114 116/022-024.
VIMS 270ct72 NN-6C/137-141.

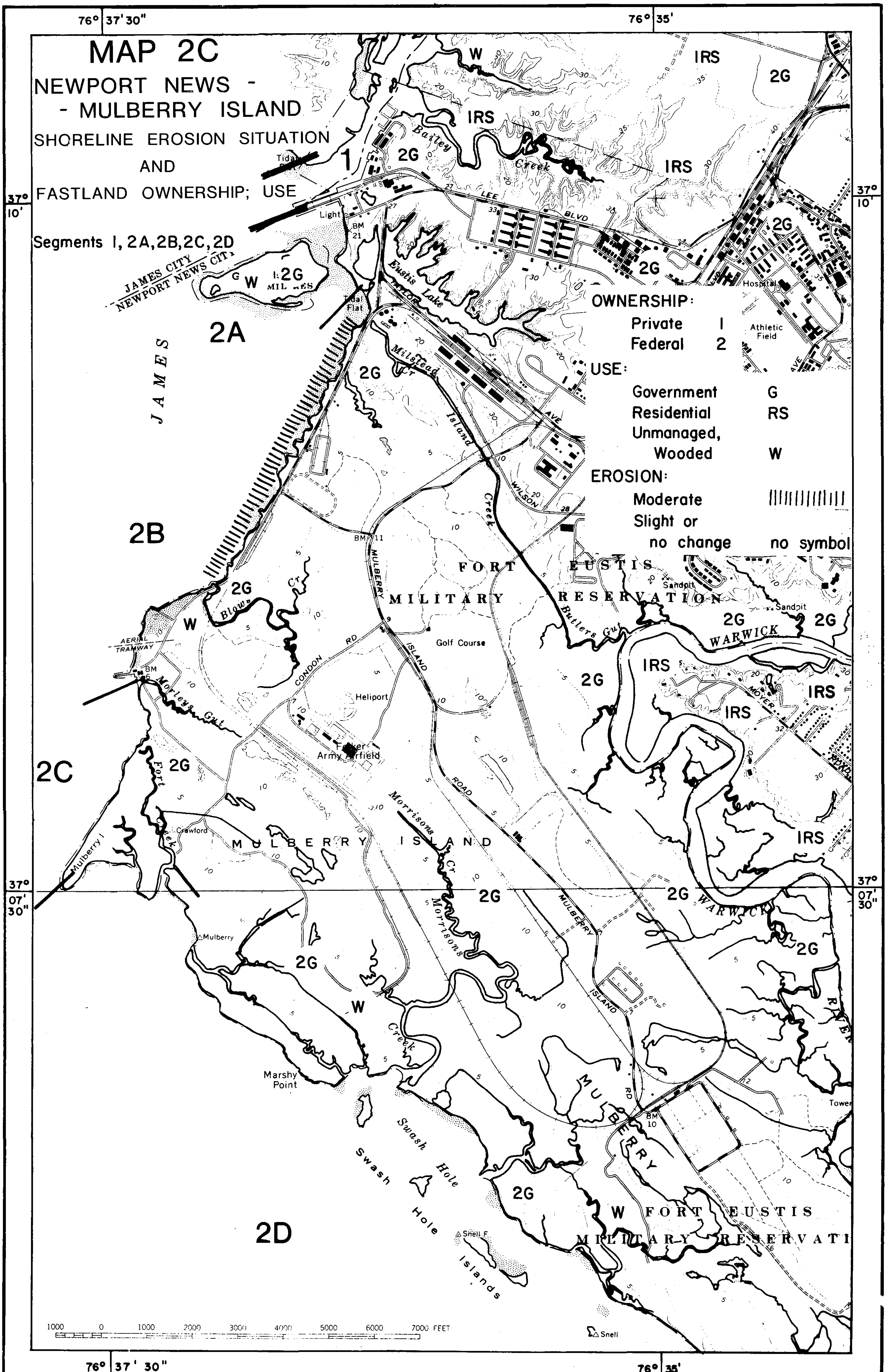
Ground - VIMS 15Feb73 NN-6C/297-303;
VIMS 28Mar73 NN-6C/292-296.

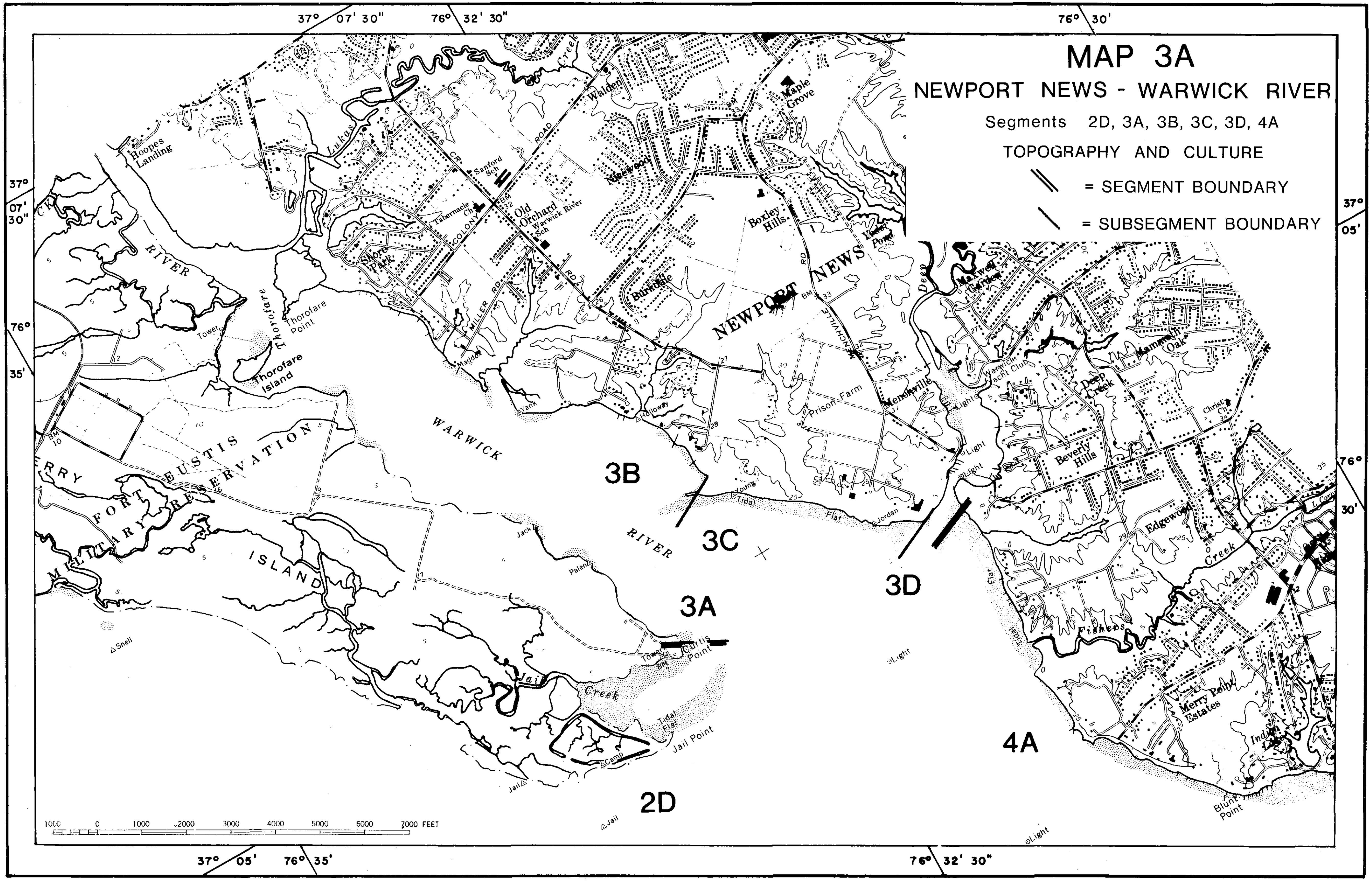
4.3 SEGMENT AND SUBSEGMENT MAPS


MAP 2A
NEWPORT NEWS –
– MULBERRY ISLAND
Segments 1, 2A, 2B, 2C, 2D
TOPOGRAPHY AND CULTURE
= SEGMENT BOUNDARY
= SUBSEGMENT BOUNDARY
76° 37' 30"
76° 35'
37° 10'
37° 07' 30"
1
2A
2B
2C
2D
JAMES RIVER
JAMES CITY CO
NEWPORT NEWS CITY
Goose Island
US MIL RES
Tidal Flat
Light
Bailey Creek
LEE
Eustis Lake
Milstead Cr
Island Creek
Hospital
Athletic Field
Tower
WASHINGTON
AVE
WILSON
Sandpit
FORT EUSTIS MILITARY RESERVATION
Butlers Gut
WARWICK
MOYER
Blows Cr
AERIAL TRAMWAY
Morleys Gut
CONDON RD
MULBERRY ISLAND ROAD
Golf Course
Heliport
Felker Army Airfield
Fort Creek
Crawford
MULBERRY ISLAND
Morrisons Cr
Mulberry I
Mulberry
Morrisons Creek
Marshy Point
Swash Hole
Swash Hole Islands
Snell
MULBERRY
RD
FORT EUSTIS MILITARY RESERVATI
WARWICK RIVER
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET



MAP 2B
NEWPORT NEWS - MULBERRY ISLAND
SHORELANDS TYPES
Segments 1, 2A, 2B, 2C, 2D
FASTLAND
Low Shore
Moderately Low Shore
Artificial
SHORE
Beach
Fringe Marsh
Extensive Marsh
Embayed Marsh
NEARSHORE
Wide
Intermediate
1
2A
2B
2C
2D
JAMES RIVER
JAMES CITY CO
NEWPORT NEWS CITY
Goose Island
US MIL RES
Tidal Flat
Eustis Lake
FORT EUSTIS MILITARY RESERVATION
MULBERRY ISLAND
Golf Course
Heliport
Felker Army Airfield
CONDON RD
MULBERRY ISLAND ROAD
Marshy Point
Swash Hole
Swash Hole Islands
AERIAL TRAMWAY
76° 37' 30"
76° 35'
37° 10'
37° 07' 30"
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET


MAP 2C
NEWPORT NEWS -
- MULBERRY ISLAND
SHORELINE EROSION SITUATION
AND
FASTLAND OWNERSHIP; USE
Segments 1, 2A, 2B, 2C, 2D
OWNERSHIP:
Private 1
Federal 2
USE:
Government G
Residential RS
Unmanaged, Wooded W
EROSION:
Moderate
Slight or no change no symbol
76° 37' 30"
76° 35'
37° 10'
37° 07' 30"
1
2A
2B
2C
2D
JAMES
JAMES CITY
NEWPORT NEWS CITY
Bailey Creek
Eustis Lake
Milstead Cr
Island Creek
Blows Cr
Morleys Gut
Fort Creek
Butlers Gut
WARWICK
Morrisons Cr
Morrisons Creek
FORT EUSTIS
MILITARY RESERVATION
MULBERRY ISLAND
Golf Course
Heliport
Felker Army Airfield
Crawford
Mulberry
Marshy Point
Swash Hole
Swash Hole Islands
Snell
Hospital
Athletic Field
AERIAL TRAMWAY
Light
Tidal Flat
Sandpit
Tower
LEE BLVD
WILSON
MOYER RD
CONDON RD
MULBERRY ISLAND ROAD
IRS
2G
W
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET


MAP 3A
NEWPORT NEWS - WARWICK RIVER
Segments 2D, 3A, 3B, 3C, 3D, 4A
TOPOGRAPHY AND CULTURE
= SEGMENT BOUNDARY
= SUBSEGMENT BOUNDARY
37° 07' 30"
76° 32' 30"
76° 30'
37° 05'
76° 35'
3B
3C
3A
3D
2D
4A
WARWICK
RIVER
NEWPORT NEWS
FORT EUSTIS MILITARY RESERVATION
MULBERRY ISLAND
Hoopes Landing
Thorofare Point
Thorofare Island
Thorofare
Tower
Lukas
LUKAS CR.
Sanford Sch
Tabernacle Ch
Old Orchard
Warwick River Sch
ROAD
Walden
Maple Grove
Boxley Hills
Burkdale
Shore Park
MILLER RD.
COLONY
Prison Farm
Menchville
Deep Creek
Warwick Yacht Club
Mamouth Oak
Christ Ch.
Beverly Hills
Edgewood
Fishers
Merry Point Estates
Blunt Point
Curtis Point
Jail Point
Jail Creek
Tidal Flat
Snell
Camp
Jail
Light
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

MAP 3B

NEWPORT NEWS – – WARWICK RIVER

SHORELANDS TYPES

Segments 2D, 3A, 3B, 3C, 3D, 4A

FASTLAND

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

SHORE

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

NEARSHORE

- Wide

3B

3C

3D

3A

4A

2D

37° 07' 30"

76° 32' 30"

76° 30'

37° 05'

76° 35'

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

MAP 3C

NEWPORT NEWS - WARWICK RIVER

SHORELINE EROSION SITUATION AND FASTLAND OWNERSHIP; USE

Segments 2D,3A,3B,3C,3D,4A

OWNERSHIP:

Private	1
Federal	2
City	5

USE:

Government	G
Commercial	C
Residential	RS
Recreational	RC
Unmanaged, Wooded	W

EROSION:

Moderate	
Slight or no change	no symbol

37° 07' 30" 76° 32' 30" 76° 30' 37° 05' 76° 35' 76° 32' 30"

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

MAP 4A

NEWPORT NEWS - RIVERSIDE

Segments 4B, 4C

TOPOGRAPHY AND CULTURE

// = SEGMENT BOUNDARY

/ = SUBSEGMENT BOUNDARY

76° 30'

37° 02' 30"

4A

4B

4C

JAMES RIVER

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

MAP 4B

NEWPORT NEWS - RIVERSIDE

SHORELANDS TYPES

Segments 4B, 4C

76° 30'

37° 02' 30"

FASTLAND
- Moderately Low Shore with Bluff
- Artificial

SHORE
- Beach
- Artificially Stabilized
- Embayed Marsh

NEARSHORE
- Wide
- Intermediate

4A

4B

4C

JAMES RIVER

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

MAP 4C

NEWPORT NEWS - RIVERSIDE

SHORELINE EROSION SITUATION
AND FASTLAND OWNERSHIP ; USE

Segments 4B, 4C

76° 30'

37° 02' 30"

4A

4B

4C

OWNERSHIP:

Private	I
City	5

EROSION:

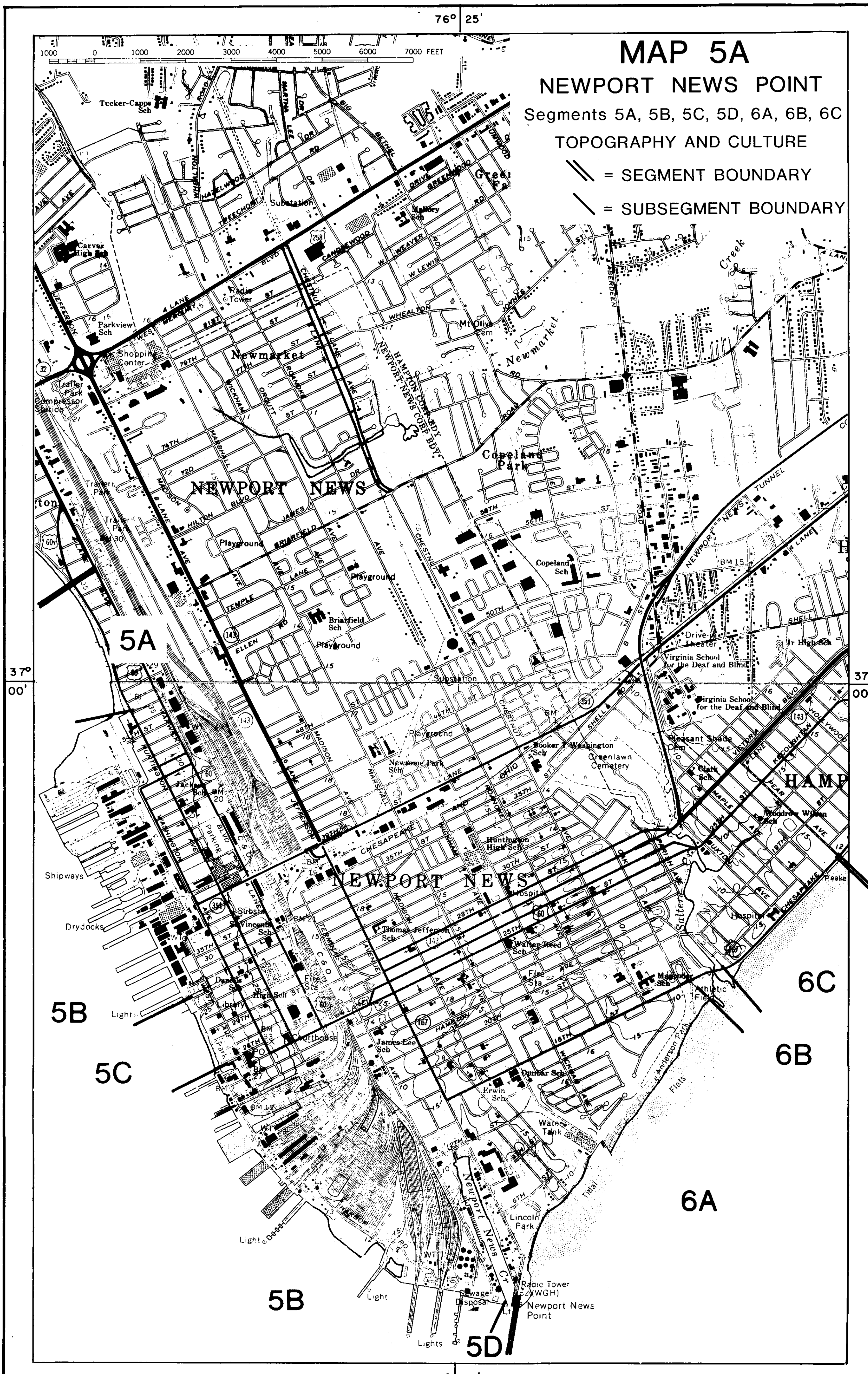
Moderate	//////////
Slight or no change	no symbol

USE:

Residential	RS
Recreational	RC
Commercial	C

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

JAMES RIVER


MAP 5A
NEWPORT NEWS POINT
Segments 5A, 5B, 5C, 5D, 6A, 6B, 6C
TOPOGRAPHY AND CULTURE
= SEGMENT BOUNDARY
= SUBSEGMENT BOUNDARY
76° 25'
37° 00'
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
NEWPORT NEWS
Newmarket
Copeland Park
Virginia School for the Deaf and Blind
Greenlawn Cemetery
Huntington High Sch
Shipways
Drydocks
Newport News Point
Lincoln Park
Sewage Disposal
Radio Tower (WGH)
5A
5B
5C
5D
6A
6B
6C

MAP 5B

NEWPORT NEWS POINT

SHORELANDS TYPES

Segments 5A, 5B, 5C, 5D, 6A, 6B, 6C

FASTLAND

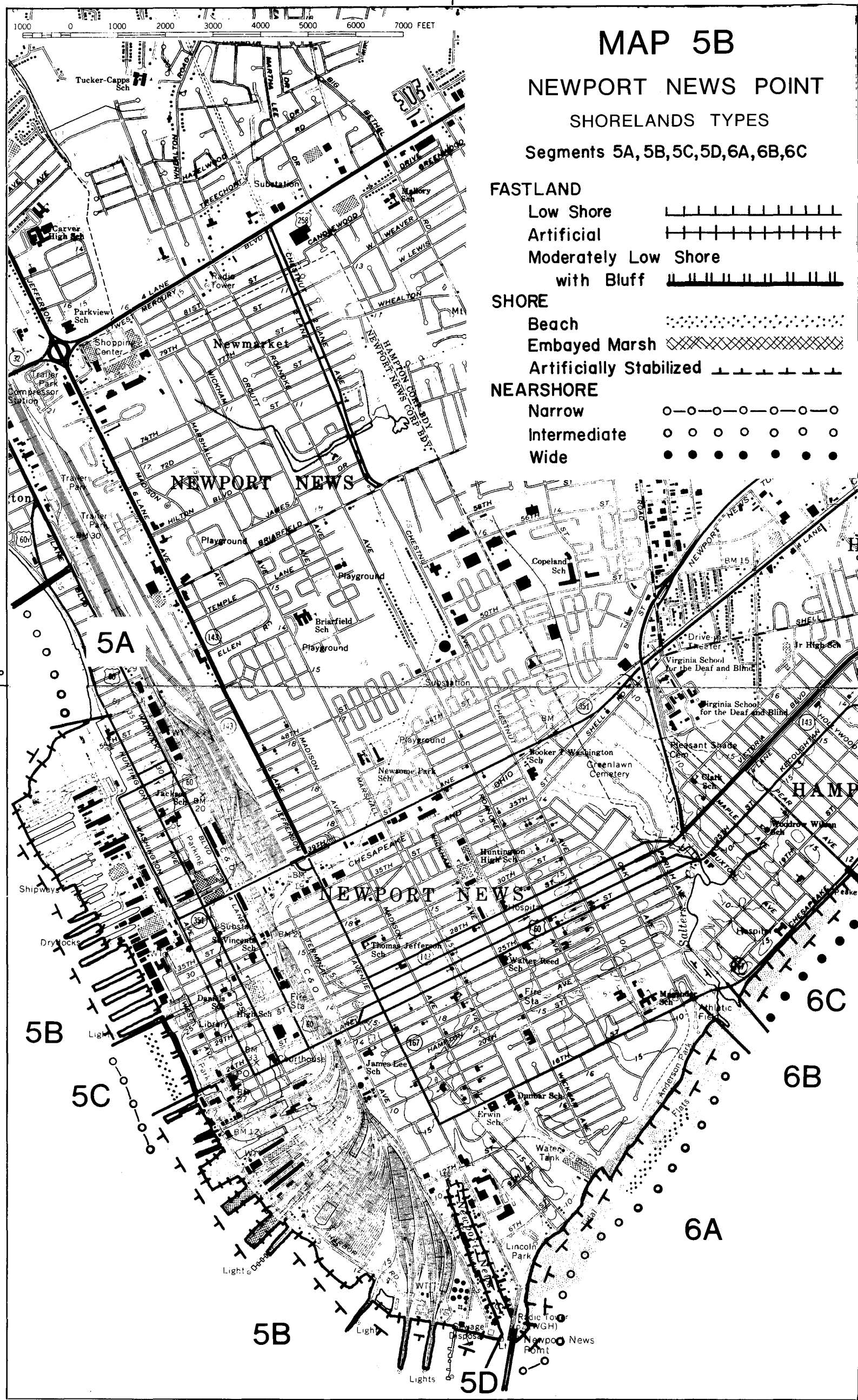
- Low Shore
- Artificial
- Moderately Low Shore with Bluff

SHORE

- Beach
- Embayed Marsh
- Artificially Stabilized

NEARSHORE

- Narrow
- Intermediate
- Wide



MAP 5C

NEWPORT NEWS POINT

SHORELINE EROSION SITUATION AND FASTLAND OWNERSHIP; USE

Segments 5A, 5B, 5C, 5D, 6A, 6B, 6C,

OWNERSHIP:

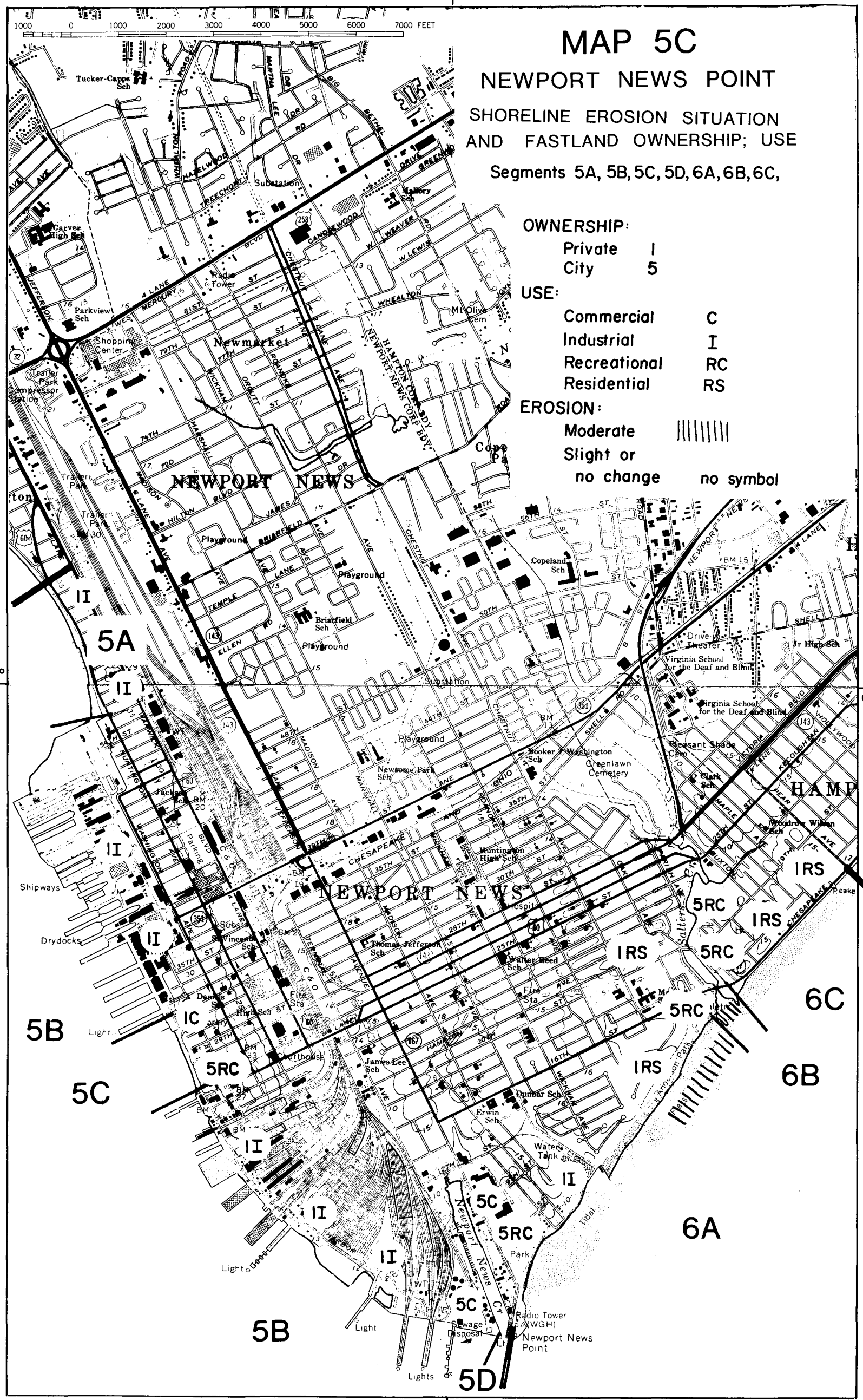
Private	I
City	5

USE:

Commercial	C
Industrial	I
Recreational	RC
Residential	RS

EROSION:

Moderate	//////////
Slight or no change	no symbol



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