United States Environmental Protection Agency | Region III Chesapeake Bay Program Office | Monitoring and Analysis Subcommittee | Tidal Monitoring and Analysis Workgroup | EPA 903-R-04-008 CBP/TRS 268/04 October 2004

Chesapeake Bay Program
A Watershed Partnership

Chesapeake Bay Program Analytical Segmentation Scheme

Revisions, Decisions and Rationales 1983–2003

October 2004

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Prepared by the
Chesapeake Bay Program
Monitoring and Analysis Subcommittee
Tidal Monitoring and Analysis Workgroup
Annapolis, Maryland

October 2004

Contents

Executive Summary

For the last 20 years, the Chesapeake Bay Program partners have used various forms of a basic segmentation scheme to organize the collection, analysis and presentation of environmental data. The *Chesapeake Bay Program Segmentation Scheme Revisions, decisions, and rationales: 1983–2003* (Segmentation Scheme Report) provides documentation on the development of the spatial segmentation scheme of the Chesapeake Bay and its tidal tributaries and the later revisions and changes over the last 20 years. It contains information on the 1983–1985 original segmentation, the 1997–1998 revisions for the 1997 Re-evaluation, and the 2003 segmentation corrections and expansion. This document provides a concise summary on the segmentation scheme background and a listing of the principal contents of the larger segmentation document related to tidal water designated uses.[1]

NEED FOR A SEGMENTATION SCHEME

Segmentation is the compartmentalizing of the estuary into subunits based on selected criteria. The Chesapeake Bay ecosystem is diverse and complex, and the physical and chemical factors which vary throughout the Bay determine the biological communities and affect the kind and extent of their response to pollution stress. These same factors also influence their response to restoration and remediation. For diagnosing anthropogenic impacts, segmentation is a way to group regions having similar natural characteristics, so that differences in water quality and biological communities among similar segments can be identified and their source elucidated. For management purposes, segmentation is a way to group similar regions to define a range of water quality and resource objectives, target specific actions and monitor response. It provides a meaningful way to summarize and present information in parallel with these objectives, and it is a useful geographic pointer for data management.

[1]The entire Chesapeake Bay Program Segmentation Scheme document can be viewed and downloaded at http://www.chesapeakebay.net/pubs/segmentscheme.pdf.

1983–1985 SEGMENTATION SCHEME

The original Chesapeake Bay Segmentation Scheme, published in the appendices of *Chesapeake Bay: A Profile of Environmental Change*, was developed in the late 1970s and early 1980s. This initial segmentation scheme formed the spatial aggregation scheme for station network design of the baywide water quality and biological monitoring programs that were initiated in the mid-1980s.

The 1983–1985 scheme was based primarily on salinity, circulation and natural features, and secondarily on biological factors and management objectives. The salinity data record on which the scheme was based extends to the late 1940s, but for many parts of the Chesapeake Bay, the data were at best patchy in time and space, and at worst, nonexistent.

1997–1998 REVISED SEGMENTATION SCHEME

Early in 1997, in preparation for tributary basin analyses in support of the 1997 Nutrient Reduction Re-evaluation, members of the Chesapeake Bay Program Monitoring Subcommittee's Data Analysis Workgroup proposed the existing segmentation scheme be revised to facilitate better linkages between water quality and living resources. Since distribution and abundance of plankton, submerged aquatic vegetation (SAV) and most other estuarine communities are strongly dependent on salinity, the spatial aggregation of plankton, SAV and water quality data for the Re-evaluation was to be based on salinity regimes. Water quality analyses for the Re-evaluation focused on changes occurring during the 12-year period 1985 to 1996, a period dominated in later years by higher than normal flows, causing relatively large shifts in salinity zone boundaries. The salinity zones were defined as tidal fresh (0–0.5 ppt), oligohaline (>0.5–5 ppt), mesohaline (>5–18 ppt) and polyhaline (greater than 18 ppt).

In the 1983 segmentation scheme, many segments contained stations with widely differing salinity characteristics. Some segments aggregated stations and waters with seemingly disparate influences. Other needs for modification were identified e.g., correcting earlier station misassignments and modifying segment boundaries to account for near shore characteristics impacting SAV assessments. The 1997 Nutrient Reduction Re-evaluation provided an opportunity to make these revisions. However, not all of the planned work was completed by the time the re-evaluation analyses had to be undertaken, so those data analyses used the interim segmentation scheme as it then existed in 1997. Further work on revising the segmentation scheme was then picked up again in 1998 and brought to a state of closure in 2003.

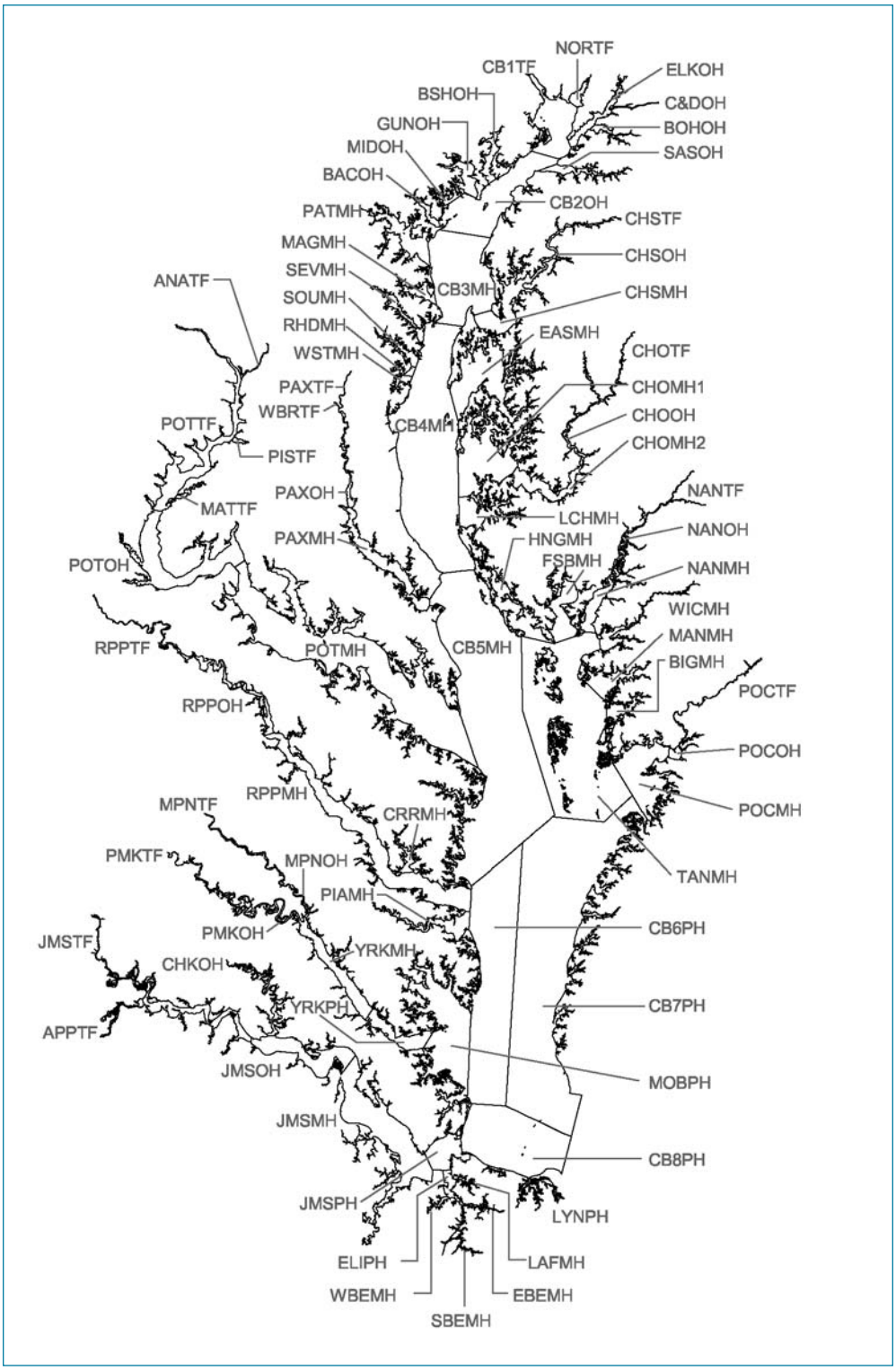
2003 SEGMENTATION SCHEME REFINEMENTS

Between 1998 and 2003, a few inadvertent errors in station coordinates and segment lines had been discovered and corrected. For the most part, the changes were small and undetectable at the scale of the figures in the referenced segmentation scheme

document. However, discrepancies might show up as small differences in volume, area or perimeter citations for affected segments. The segmentation scheme was expanded in the Potomac River to incorporate additional below-fall line stations in the Potomac and Anacostia rivers. In addition, a new segment was created for the Anacostia River (ANATF), and in the Elizabeth River, segment ELIMH was redefined as polyhaline and joined with segment ELIPH. The details of all these changes are given in the complete document.

The *Segmentation Scheme Report* contains the following maps and tables used to document changes to the segmentation scheme from 1983 through 2003 and provides the jurisdictions with detailed documentation on the geographical delineation of each segment's boundaries:

- Maps for the 1983, 1997, 1998 and 2003 segmentation schemes;
- Statistics on the perimeter, surface and volume of each Chesapeake Bay Program segment;
- Narrative descriptions of each of the coordinates bounding each Chesapeake Bay Program segment;
- Maps of all the Chesapeake Bay Water Quality monitoring program stations displayed by segment for Maryland, Virginia and the District of Columbia; and,
- Maps and table describing Maryland's split segments for application of the shallow-water bay grass designated use and Virginia's upper James River split segment.



2003 Chesapeake Bay Segmentation Scheme

Source: Chesapeake Bay Program.

2003 Chesapeake Bay Program Segment Names and Codes

Northern Chesapeake Bay	CB1TF	Mobjack Bay	MOBPH
Upper Chesapeake Bay	CB2OH	Upper James River	JMSTF
Upper Central Chesapeake Bay	CB3MH	Appomattox River	APPTF
Middle Central Chesapeake Bay	CB4MH	Middle James River	JMSOH
Lower Central Chesapeake Bay	CB5MH	Chickahominy River	CHKOH
Western Lower Chesapeake Bay	CB6PH	Lower James River	JMSMH
Eastern Lower Chesapeake Bay	CB7PH	Mouth of the James River	JMSPH
Mouth of Chesapeake Bay	CB8PH	Western Branch Elizabeth River	WBEMH
Bush River	BSHOH	Southern Branch Elizabeth River	SBEMH
Gunpowder River	GUNOH	Eastern Branch Elizabeth River	EBEMH
Middle River	MIDOH	Lafayette River	LAFMH
Back River	BACOH	Mouth to mid-Elizabeth River	ELIPH
Patapsco River	PATMH	Lynnhaven River	LYNPH
Magothy River	MAGMH	Northeast River	NORTF
Severn River	SEVMH	C&D Canal	C&DOH
South River	SOUMH	Bohemia River	BOHOH
Rhode River	RHDMH	Elk River	ELKOH
West River	WSTMH	Sassafras River	SASOH
Upper Patuxent River	PAXTF	Upper Chester River	CHSTF
Western Branch Patuxent River	WBRTF	Middle Chester River	CHSOH
Middle Patuxent River	PAXOH	Lower Chester River	CHSMH
Lower Patuxent River	PAXMH	Eastern Bay	EASMH
Upper Potomac River	POTTF	Upper Choptank River	CHOTF
Anacostia River	ANATF	Middle Choptank River	CHOOH
Piscataway Creek	PISTF	Lower Choptank River	CHOMH1
Mattawoman Creek	MATTF	Mouth of the Choptank River	CHOMH2
Middle Potomac	POTOH	Little Choptank River	LCHMH
Lower Potomac	POTMH	Honga River	HNGMH
Upper Rappahannock River	RPPTF	Fishing Bay	FSBMH
Middle Rappahannock River	RPPOH	Upper Nanticoke River	NANTF
Lower Rappahannock River	RPPMH	Middle Nanticoke River	NANOH
Corrotoman River	CRRMH	Lower Nanticoke River	NANMH
Piankatank River	PIAMH	Wicomico River	WICMH
Upper Mattaponi River	MPNTF	Manokin River	MANMH
Lower Mattaponi River	MPNOH	Big Annemessex River	BIGMH
Upper Pamunkey River	PMKTF	Upper Pocomoke River	POCTF
Lower Pamunkey River	PMKOH	Middle Pocomoke River	POCOH
Middle York River	YRKMH	Lower Pocomoke River	POCMH
Lower York River	YRKPH	Tangier Sound	TANMH

Source: Chesapeake Bay Program.

Acknowledgments

The ad hoc team to draft the 1997 re-evaluation segmentation scheme consisted of Peter Bergstrom, then of U.S. Fish and Wildlife Service, now at NOAA Chesapeake Bay Office; Rick Hoffman, Virginia Department of Environmental Quality; Bruce Michael, Maryland Department of Natural Resources; and Marcia Olson, NOAA Chesapeake Bay Office. The Box and Whisker plots of salinity for each monitoring station were created by Dr. Elgin Perry, statistical consultant. Paula Jasinski, formerly a member of the Chesapeake Bay Program Office GIS team and currently with the NOAA Chesapeake Bay Office, created the isopleth maps and GIS coverage, fielded and summarized the review comments. She was assisted with the GIS coverage by Dave Wilcox, Virginia Institute of Marine Science.

The 2003 revisions were made by the Chesapeake Bay Program Office GIS team of Howard Weinberg, University of Maryland Center for Environmental Studies, who provided the segment textual description, GIS segment revisions and text and maps for sub-segments for state water quality standard applications; Andy Fitch, University of Maryland Center for Environmental Studies, who created the station maps; and Patrick Nowlan, National Park Service, who worked on the creation of new bathymetry segment files for the Chesapeake Bay Program Volumetric Interpolator. Marcia Olson, NOAA Chesapeake Bay Office, updated the 1998 version adding text to link the early versions to the 2003 updates, and Ricky Bahner, Interstate Commission on the Potomac River Basin, edited the tables and worked with the GIS team to update the station maps.

chapter i

Introduction

The Chesapeake Bay Program spatial segmentation scheme has evolved over the past two decades as management needs have changed and new analytical applications have been built upon old ones. At the same time, data management and processing technology and spatial analytical tools associated with the segmentation scheme also have been rapidly evolving. Evolution and change are good, but the process can leave behind errors, inconsistencies and apparently illogical situations that are artifacts of earlier versions or mistakes in the process. This report documents the changes to the segmentation scheme over the past 20 years, the reasons behind the changes, the known errors and lingering artifacts.

Segmentation is the compartmentalizing of the estuary into subunits based on selected criteria. The Chesapeake Bay ecosystem is diverse and complex, and the physical and chemical factors that vary throughout the Bay determine the biological communities and affect the kind and extent of their response to pollution stress. These same factors also influence their response to remediation actions and restoration. In order to diagnose anthropogenic impacts, segmentation is a way to group regions having similar natural characteristics, so that differences in water quality and biological communities among similar segments can be identified and common stressors and responses elucidated. For management purposes, segmentation is a way to group similar regions to define a range of water quality and resource objectives, target specific actions, and monitor response. It provides a meaningful way to summarize and present information in parallel with these objectives, and it is a useful geographic pointer for management of data and information.

chapter ii

1983 Segmentation Scheme

The original 1983 Chesapeake Bay segmentation scheme (Figure 1) was adapted from Klein (unpublished) and described in the Appendices of the EPA report, *Chesapeake Bay: A Profile of Environmental Change* (Flemer et al. 1983). Originally designed for the purpose of water quality assessment, the system was based primarily on geomorphology, circulation, and salinity, and secondarily on biological factors and management objectives. The 45 segments were grouped according to five categories: tidal-fresh reaches, transition zones, lower estuarine reaches, lower main bay, and embayments. The salinity data record on which the scheme was based extended back to the late 1940s, but for many parts of the Bay, the data were at best patchy in time and space, and at worst, nonexistent. In any case, segment boundaries were based on the longest available record to take into account as much as possible the up- and downstream shifts of the salt wedge. Boundaries and principal segment characteristics were clearly defined for each segment.

The 1983 segmentation scheme was used in the analyses to assess the state of the Chesapeake Bay in the late 1970s and early 1980s setting the future course for the Chesapeake Bay Program that was being formed. It played a central role in the tidal water quality and biological monitoring station network design (Appendix A), data analysis and interpretation. The system, introduced in 1983, was based on the analysis of historic data, and remained in use until the 1997 Re-evaluation analysis revisions.

A description of the 1983 segmentation scheme along with maps and defining latitude/longitude coordinates was published as a separate reference document, *The Chesapeake Bay Segmentation Scheme* (Chesapeake Bay Program 1990).[2]

[2]In the current Chesapeake Information Management System (CIMS) geographic information system (GIS) database and the Chesapeake Bay Program website-accessible tables, the original scheme is referred to as CBSeg_1985

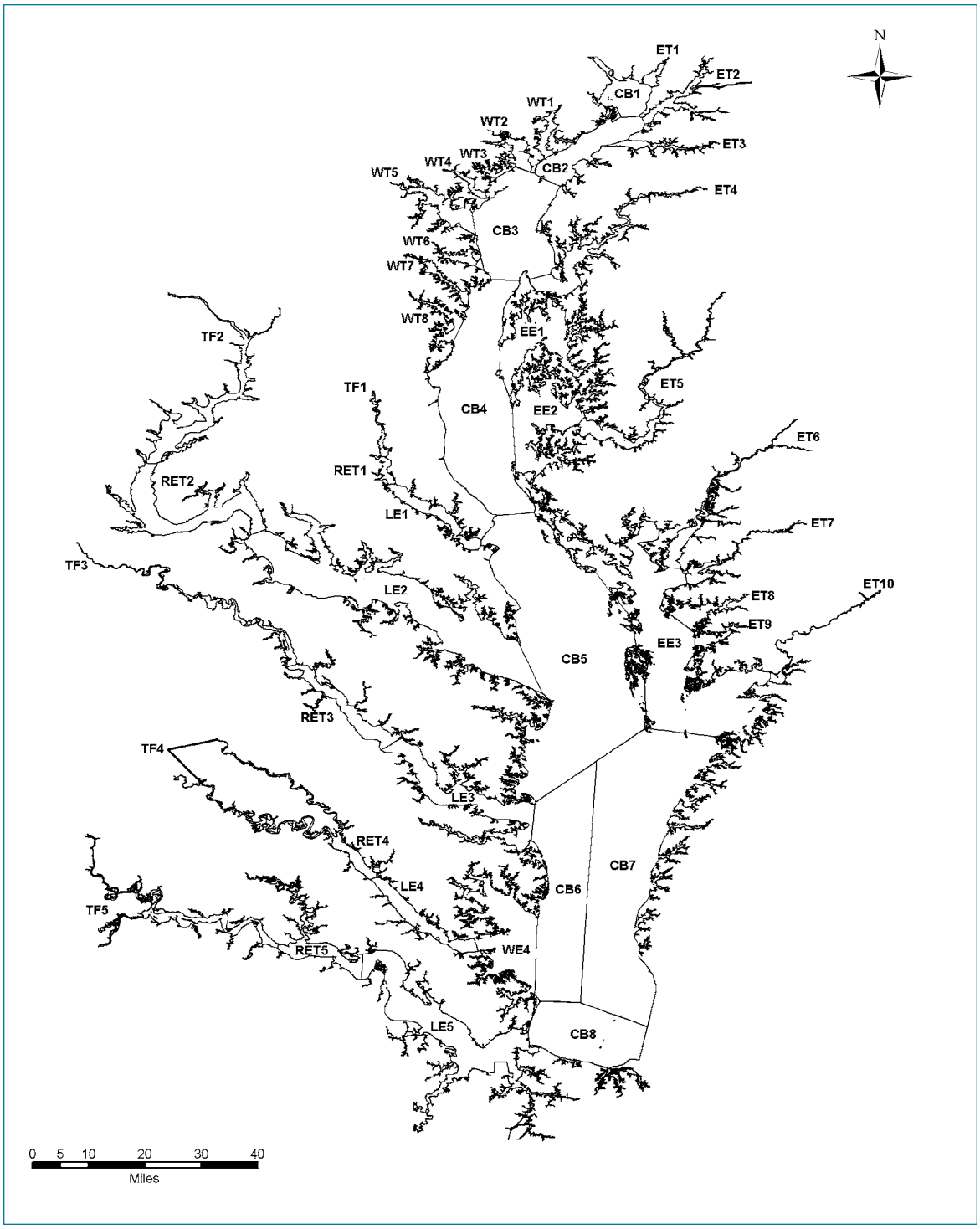


Figure 1. Original 1983 Chesapeake Bay Program segmentation scheme.

Source: Flemer et al. 1983.

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chapter iii

1997–1998 Segmentation Scheme

The Chesapeake Bay and tidal tributaries are estuaries offering brackish water habitats of varying salinity and other chemical characteristics. Most aquatic organisms have an optimum salinity concentration in which they thrive and a range of salinity concentrations they tolerate that govern their seasonal and spatial abundance and distribution. In order to conduct meaningful analyses, species with similar habitat requirements and locations with similar water quality characteristics should be grouped together. Salinity must therefore be a major factor in any segmentation scheme that aggregates data for analysis.

Early in 1997, in preparation for basin-wide analyses in support of the 1997 Nutrient Reduction Re-evaluation, members of the Chesapeake Bay Program Monitoring Subcommittee Data Analysis Workgroup proposed that the existing 1983 segmentation scheme be revised to facilitate better linkages between water quality and living resources. Water quality analyses for the re-evaluation focused on changes occurring during the 12-year period from 1985 to 1996, which was dominated in later years by higher-than-normal flows, causing relatively large shifts in salinity zone boundaries. Many segments then contained stations with widely differing salinity characteristics. In addition, some segments such as WT8 that included the South, Rhode and West rivers, and EE2 that included the lower Choptank and the embayment at the mouth of the Little Choptank, aggregated stations and waters with seemingly disparate influences (Figure 1). The authors of the original segmentation scheme acknowledged the need for additional data and refinement of the boundaries. Other modifications were also needed, for example, correcting earlier station mis-assignments and modifying segment boundaries to account for near-shore characteristics impacting SAV assessments. The revision of the original 1983 segmentation scheme called for in support of the nutrient reduction re-evaluation, provided an opportunity to make these modifications.

However, not all of the planned work was completed by the time the re-evaluation analyses had to be undertaken. For example, the branches to the Elizabeth River were still grouped as one polyhaline segment (WT10PH), SAV beds had not been

adequately accounted for in the Tangier Sound, and there were three segments containing mesohaline waters in the Rappahannock River, which was inconsistent with decisions made in other tidal tributaries. The re-evaluation analyses used the interim segmentation scheme as it then existed in 1997 (Figure 2), with the further revisions to the segmentation scheme completed in 1998 (Figure 3) until the review and expansion undertaken in 2003.

FACTORS CONSIDERED IN THE REVISION PROCESS

An ad hoc committee (see Acknowledgments) was formed from the Chesapeake Bay Program Monitoring Subcommittee's Data Analysis Workgroup membership to draft a revised scheme. The committee based the new scheme on a hierarchy of considerations: salinity, natural geographic partitions and features and original segmentation boundaries.

SALINITY

Salinity was the primary criterion driving revisions to the original 1983 segmentation scheme. The revised segmentation scheme recognized four salinity categories or regimes:

- Tidal fresh (TF): 0–0.5 ppt;
- Oligohaline (OH): >0.5–5 ppt;
- Mesohaline (MH): >5–18 ppt; and
- Polyhaline (PH): >18 ppt.

The objective of the revision was to create segments containing tidal monitoring stations of like salinity characteristics.

NATURAL GEOGRAPHIC PARTITIONS AND FEATURES

The major tidal tributaries were separated from the mainstem Chesapeake Bay at the mouth, with segment lines formed by connecting terminal land extensions on either side of the river. In the course of the revision process, the ad hoc committee learned that the U.S. Geological Survey (USGS) was in the process of redefining river mouth boundaries for the National Hydrographic Delineation Project and investigated the utility of co-locating the Chesapeake Bay Program river mouth segment lines with the USGS delineations. The ad hoc committee ultimately decided against this, since the USGS river mouth delineations were set without rules and did not fully match with the Chesapeake Bay Program segmentation scheme's objectives. With some exceptions, the ad hoc committee decided to preserve the original river mouth segment lines.

In the original 1983 segmentation scheme, some small tidal tributaries and isolated tidal water areas with monitoring stations were grouped with nearby segments. In the

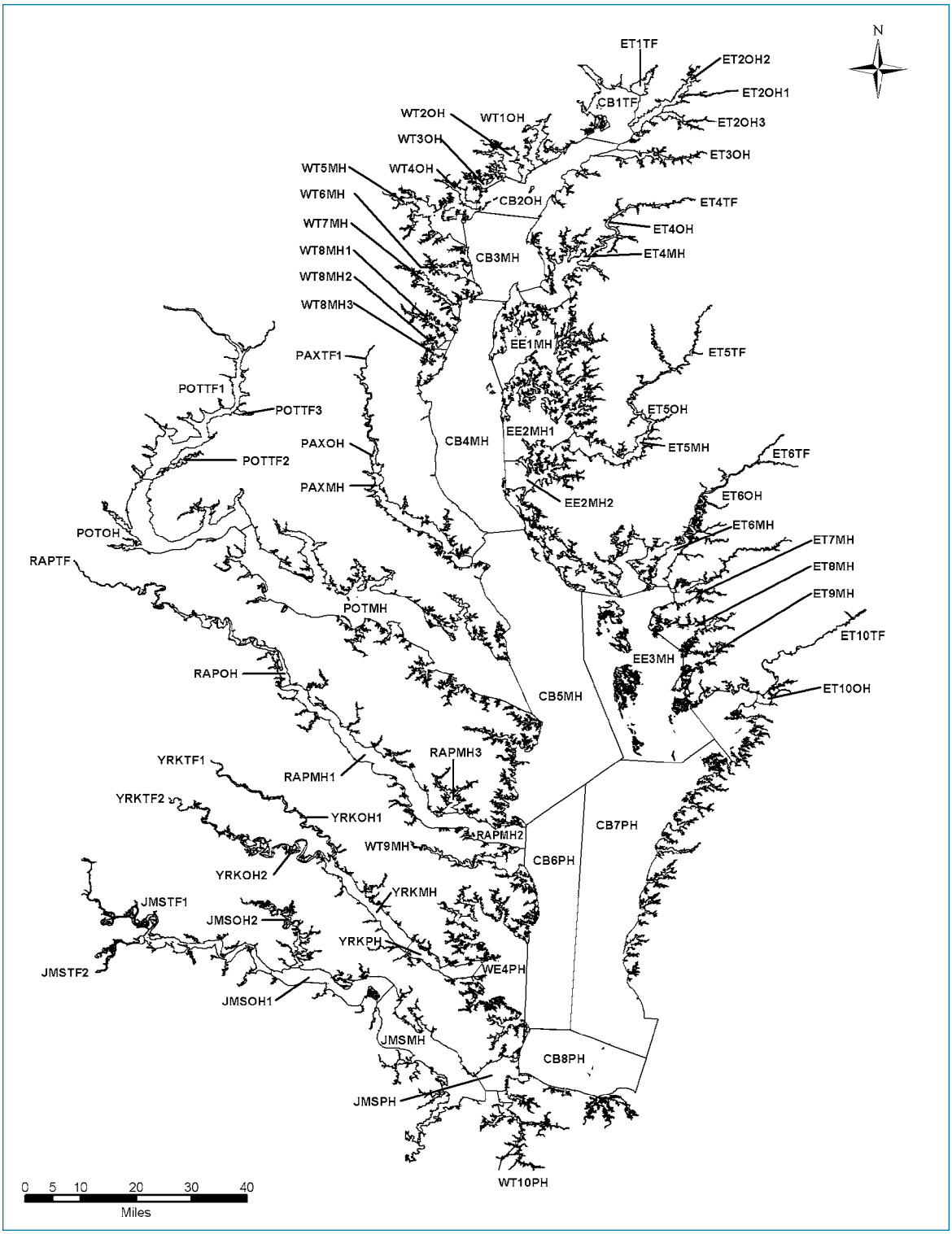

Figure 2. 1997 Chesapeake Bay Program segmentation scheme.

Source: Chesapeake Bay Program.

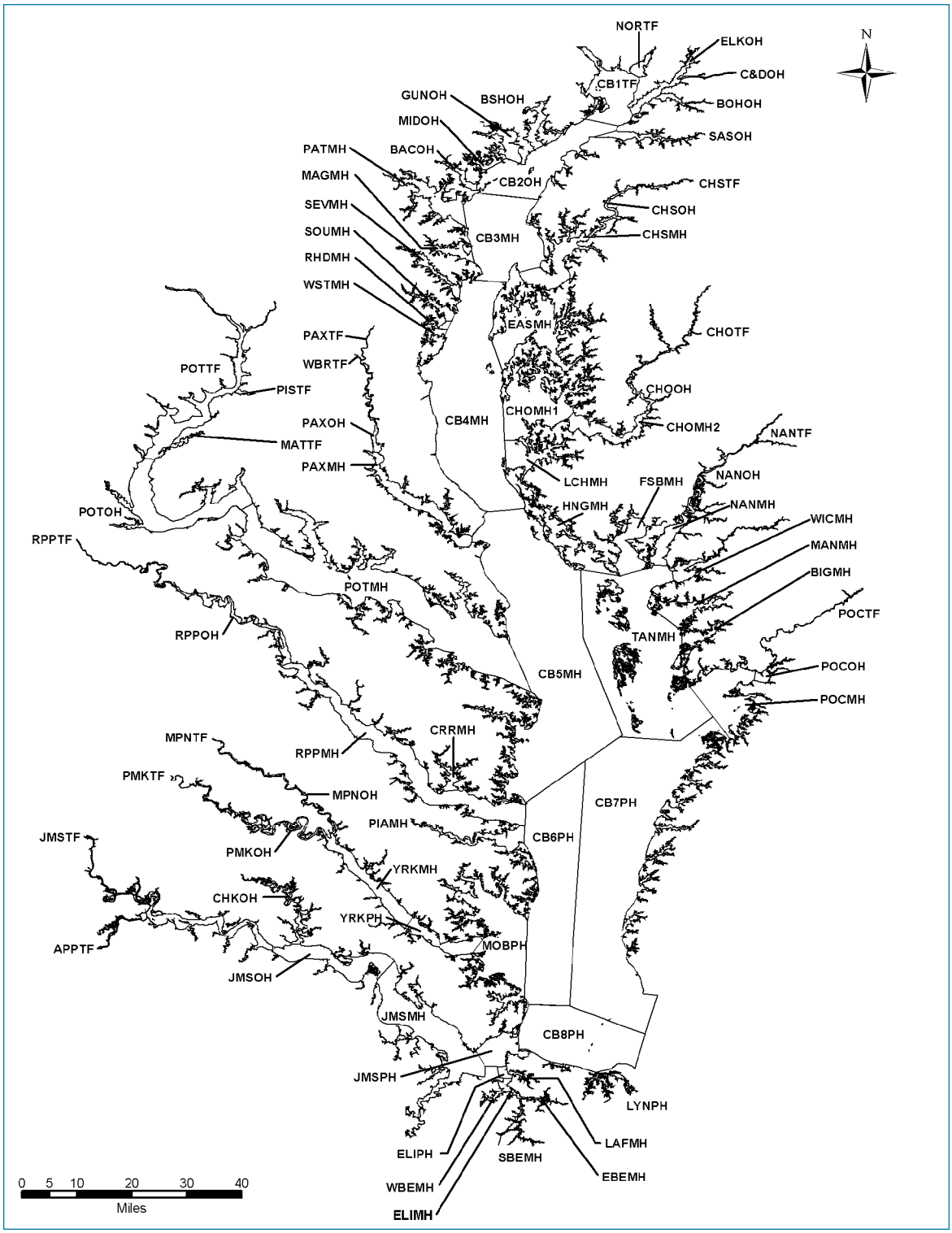

Figure 3. 1998 Chesapeake Bay Program segmentation scheme.

Source: Chesapeake Bay Program.

revised segmentation scheme, these tidal water areas were partitioned into individual segments. Segment lines near the mid-Bay islands (e.g., Bloodsworth, Smith and Tangier) were revised based on their surrounding shallow-water habitat with submerged aquatic vegetation (SAV) assessments in mind. Finally, bathymetry and circulation patterns influenced small shifts in boundary lines in segments CB7 and CB8 in the mainstem Bay.

ORIGINAL SEGMENTATION BOUNDARIES

The original 1983 segmentation scheme boundaries were preserved where the above described considerations were met and there was no other compelling reason to change.

SEGMENTATION SCHEME REVISION PROCESS

1997 INTERIM SEGMENTATION SCHEME

The first step was to determine salinity characteristics of each of the over 150 tidal water quality monitoring stations. Box and whisker plots showing summary statistics for surface and bottom salinity at each station over the 12-year (1985-1996) period were created. On the advice of the Data Analysis Workgroup, each station was assigned to one of the four salinity regimes previously described based on the 12-year grand mean of the monthly mean surface salinities. The station's surface grand mean was the primary criterion; bottom grand mean salinity was used in borderline decisions.

By the spring of 1997, a preliminary segmentation scheme was in place with station assignments completed and temporary segment boundary lines drawn midway between stations in different salinity regimes. Segment names, which were variations of original segment names, were still temporary. Most, if not all, of the station-based analyses for the 1997 re-evaluation were done using the segment assignments in place at this stage of the revision process (Figure 2).

1998 SEGMENTATION SCHEME

Later in 1997, to establish more formal salinity-based segment lines, a map of 0.5 ppt salinity isopleths was created using Arc/INFO® interpolation software and the mean monthly surface salinity point data. Segment lines were redrawn at the isopleth breaks using the salinity classifications described above. The break lines and guidance from the ad hoc committee were used to draft a new segmentation coverage. The salinity plots and GIS maps were then reviewed by the Chesapeake Bay Program Monitoring and Living Resources subcommittees, especially the SAV Workgroup and scientific investigators researching the bottom dwelling benthic community. Suggestions for modifications were submitted to the ad hoc committee for review. Those decisions are part of this document.

By 1998, the segmentation scheme boundary lines were fixed and a new segment naming convention was adopted. In the new segment renaming convention, the first three spaces reflect the tributary name, spaces four and five are the abbreviation of the salinity zone (TF, OH, MH or PH), and a sixth space is reserved for subdivisions of the salinity zone. For example, the mesohaline region of the Choptank River has two segments—CHOMH1 and CHOMH2—with the numbers increasing in sequence up-bay and up-river.

TIDAL MONITORING STATION NAMES

A consequence of revising the segmentation scheme and segment-naming convention was the 'orphaning' of the station names. Most of the stations in the tidal water quality and biological monitoring programs had names indicating the original Chesapeake Bay Program segment and their relational location within the segment. There was an effort to explore the possibilities and consequences of changing the station names either to better coincide with the new segmentation scheme or to decouple the naming convention from the segment scheme altogether. In the end, the ad hoc committee decided that it could not devise a naming convention that better met the needs and limitations of the data collectors, data base managers, analysts and historians. Thus, existing stations retain their Chesapeake Bay Program name or other original name, if desired (see Appendix A Table A-1), and there are no rules for the naming of new sampling locations.

1997–1998 SEGMENTATION REVISION DECISIONS IN DETAIL

The segmentation revision recommendations and some of the decision rationales are described below. Old segment and station names are the primary reference with the new segment assignment indicated in the text. The tidal monitoring station table (Appendix A Table A-1) includes the original Chesapeake Bay Program segment assignment and subsequent updates.

Segment ET1: Northeast River. The segment name was changed to NORTF with no changes to the boundary.

Segment ET2: C & D Canal, Elk River and Bohemia River. This original segment contained three oligohaline tidal water quality monitoring stations: one each in the C & D canal, the upper Elk River and the Bohemia River. The original segment was subdivided into three separate segments, each containing a monitoring station. A new segment, C&DOH, was formed with a boundary at the entrance to the C & D canal. A new segment, BOHOH, was formed with a boundary at the mouth of the Bohemia River where it joins the Elk River. A new segment, ELKOH, was formed containing the mainstem of the Elk River using the original segment line where the Elk River meets the mainstem Chesapeake Bay.

Segment ET3: Sassafras River. The segment name was changed to SASOH with no changes to the boundary.

Segment ET4: Chester River. This original segment contained three monitoring stations reflecting two salinity regimes. The original segment was divided in two, creating a mesohaline segment (CHSMH) using the old downstream boundary line for segment ET4 as the boundary line between CHSMH and the mainstem Chesapeake Bay, and an oligohaline segment (CHSOH) with a boundary line at the interpolated salinity breakpoint between stations ET4.1 and ET4.2. A tidal-fresh segment (CHSTF) was created upstream from station ET4.2 at the original upstream boundary line for segment ET4. The validity of that line was corroborated by estimating the location of the 0.5 ppt salinity isopleth based on the rate of change in salinity between the ET4.1 and ET4.2. The upstream boundary of CHSTF is head of tide.

Segment EE1: Eastern Bay. The boundary between old EE1 and the mainstem Chesapeake Bay was moved slightly eastward so that station CB4.1E was contained in segment CB4 (now CB4MH). The segment name was changed to EASMH. Water quality data were insufficient (no monitoring stations) to delineate additional boundaries upstream near the Miles and Wye rivers.

Segments EE2 and ET5: The embayment at the mouth of the Choptank River and Choptank River proper. All of segment EE2 and the lower part of ET5 were characterized as mesohaline; the upstream station, ET5.1, was determined to be oligohaline. The next upstream station is River Input station ET5.0, which characterizes free flowing fresh water. The mesohaline region was divided into three segments:

- Segment CHOMH2 included the lower part of original segment ET5 bounded above by a new line at the interpolated salinity breakpoint between mesohaline station ET5.2 and oligohaline station ET5.1 and below, at the old segment line between ET5 and EE2;
- Segment CHOMH1 was formed by the embayment, i.e., the northern part of original segment EE2, with the old segment line between the mainstem Chesapeake Bay and EE2 forming the western boundary; and
- Segment LCHMH was formed by the southern part of the original segment EE2, the Little Choptank River.

In addition, an oligohaline segment (CHOOH) in the upper Choptank River was created using the line between stations ET5.2 and ET5.1 as the lower boundary and a line upstream of ET5.1 at an interpolated breakpoint as the upper boundary. A tidal-fresh segment (CHOTF) was created with an upper boundary defined by the limit of tidal influence. Segment CHOTF has no monitoring station at this time.

Segment EE3: Tangier Sound and surrounding tributaries. The original Tangier Sound segment was renamed as TANMH and revised by moving the boundary between EE3 and the Chesapeake Bay mainstem segment CB5 westward just far

enough to include Bloodsworth, Smith, Tangier and the other islands in that line plus the shallow waters to their western side. The western boundary was delineated to include shallow water habitats out to two meters mean low water. This boundary line was 'bent' eastward to meet the southern tip of lower Hooper Island. New separate segments were created for the Honga River (HNGMH), which contains no fixed monitoring station at this time, and another for Fishing Bay (FSBMH) containing station EE3.0, with the boundary lines being drawn at the respective tributary mouths. The existing boundaries were retained at the mouths of the Nanticoke and Wicomico rivers. The boundaries of TANMH were adjusted with the lower Tangier tributary segments and with the lower Chesapeake Bay segment as described below.[3]

Segment ET6: Nanticoke River. The original segment was subdivided into three segments: a mesohaline segment (NANMH) containing monitoring station ET6.2, an oligohaline segment (NANOH) containing no monitoring station and a tidal-fresh segment (NANTF), containing monitoring station ET6.1. The original EE3-ET6 segment line was retained as the boundary between the Tangier Sound (TANMH) and lower Nanticoke River (NANMH) segments. The interpolated salinity break-points were used to determine the boundaries of the oligohaline and tidal fresh segments.

Segment ET7: Wicomico River and Monie Bay. The segment name was changed to WICMH with no changes to the boundary.

Segment ET8: Manokin River. The EE3-ET8 boundary was moved westward to contain Little Deal Island within the renamed segment (MNKMH).

Segment ET9: Big Annemessex. The original EE3-ET9 boundary was moved westward to include the terminal island on the north side of the river mouth within the renamed segment (BIGMH).

Segment ET10: Pocomoke River. Three new separate segments (POCMH, POCOH and POCTF) were created. POCMH includes the mesohaline portions of Pocomoke River and Pocomoke Sound. The lower boundary was drawn across the mouth of Pocomoke Sound from the mainland below Crisfield to the south shore of Pocomoke Sound, joining the TANMH-CB7MH boundary and diverting around Beach Island. The new segment line intersected land on the southeast shore of Pocomoke Sound between Deep Creek and Doe Creek. All the islands on the west side of Tangier Sound including Bloodsworth, South Marsh, Smith, Tangier, Walls and Cedar islands were included in TANMH. Beach Island and surrounding shallow-water habitats out to two meters mean low water at the base of Beasly Bay and station EE3.5 were included in the new mainstem Chesapeake Bay segment CB7PH. There are three tidal water quality monitoring stations in the Pocomoke River: stations EE3.3 and EE3.4 are both mesohaline and were located in the new segment

[3]A recommendation to divide EE3 in half, with a boundary line extending laterally from a point between the Manokin and Big Annemessex rivers between the islands to the north-south boundary between EE3 and CB5, was rejected because it did not conform to the general rules considered and there were no compelling arguments in favor of such a change.

POCMH. The upstream station, ET10.1, is tidal-fresh and was located in the new segment POCTF. The new oligohaline segment POCOH contains no monitoring station at this time. The original EE3-ET10 segment line became the lower boundary of POCOH and the interpolated salinity breakpoint marked the division between segments POCOH and POCTF.

Segments WT1 through WT7: Bush, Gunpowder, Middle, Back, Patapsco, Magothy and Severn rivers. Each of these western shore tidal tributaries has only one tidal water quality monitoring station and data were insufficient to differentiate more than one salinity zone. The segment names for the Bush (BSHOH), Gunpowder (GUNOH), Middle (MIDOH), Back (BACOH), Patapsco (PATMH), Magothy (MAGMH) and Severn (SEVMH) rivers were changed with no changes made to the boundaries.

Segment WT8: South, Rhode and West rivers. The original segment contained tidal water quality monitoring stations in three separate tidal tributaries. Separate segments were created for each tidal tributary with segment lines drawn at the mouths of the respective individual rivers: South (SOUMH), Rhode (RHDMH) and West (WSTMH) rivers. The available water quality data were insufficient to define oligohaline or tidal-fresh segments within these individual tidal tributaries.

Segments TF1, RET1 and LE1: Patuxent River. Data from the tidal water quality monitoring stations indicated three salinity regimes along the tidal river. The mainstem of the tidal Patuxent River was divided into three segments with the old segment line between LE1 and the mainstem Chesapeake Bay segment CB5 preserved as the downstream boundary of the new mesohaline segment PAXMH. The old segment line between RET1 and TF1 was used as the boundary between PAXMH and the new oligohaline segment PAXOH. The boundary between PAXOH and the new tidal-fresh segment PAXTF was established using the interpolated salinity breakpoint between stations TF1.5 and TF1.6. A separate segment (WBRTF) was created for the Patuxent River's Western Branch tributary, which contains two tidal water quality monitoring stations.

Segments TF2, RET2 and LE2: Potomac River. The tidal Potomac River contains three salinity regimes and has several minor tidal tributaries of special interest. Although large, the mesohaline region was delineated as one segment (POTMH), with the downstream boundary drawn eastward of the original LE2-CB5 segment line to include station LE2.3. A new oligohaline segment (POTOH) was created using the interpolated salinity breakpoint between stations RET2.4 and RET2.3 as the lower boundary.[4] A new tidal-fresh segment (POTTF) was created using the old

[4]A suggestion to subdivide POTTF on the basis of SAV trends and on the basis of different data collecting agencies was rejected. It should be noted, however, that most tidal water quality analyses for segment POTTF to date have included data only from stations south of and including TF2.1 (near Fort Washington and Piscataway Creek). For a number of years, Anacostia River stations were assigned to segment POTTF in the Chesapeake Bay Program monitoring database. However, no known Data Analysis Workgroup or Tidal Monitoring and Analysis Workgroup sponsored analysis was ever done that pooled all these stations into one segment. See the section '2003 Segmentation Scheme' for more documentation and further changes to segment POTTF.

RET2-TF2 segment line. Its upper boundary was the fall-line gauging station at Little Falls. Separate segments were created for the two smaller tidal tributaries to the Potomac River which had tidal water quality monitoring stations: Mattawoman Creek (MATTF) and Piscataway Creek (PISTF).

Segments TF3, RET3 and LE3: Rappahannock River. The tidal Rappahannock River contains three salinity regimes. In the first draft of the new segmentation scheme, which was used in the 1997 re-evaluation, the recommendation was to divide the mesohaline portion of the river's mainstem into two segments, RPPMH1 and RPPMH2, which approximated old segments LE3 plus station LE3.6 and RET3, respectively. Upon subsequent review, the mainstem mesohaline region was delineated as one segment, to conform with decision precedents in the tidal Potomac River and elsewhere. The tidal Piankatank River, containing station LE3.7, was delineated as a separate new segment (PIAMH) with the boundary between this tidal tributary and the mainstem Chesapeake Bay delineated so that Milford Haven and nearby tidal creeks were included in this segment. In the mainstem of the Rappahannock River, a single mesohaline segment (RPPMH) was created containing both original segments LE3 and RET3. The segment line was drawn at the river mouth, connecting the terminal points of land and adjusting the line so that station LE3.6 was included in the mesohaline river segment. The tidal Corrotoman River, which contains station LE3.3 and which empties into this segment, was delineated as a separate new segment (CRRMH). In the mainstem Rappahannock River, a new oligohaline segment (RPPOH) was created containing only station TF3.3, using the original TF3-RET3 segment line as the lower boundary with RPPMH, and the interpolated salinity isopleth between stations TF3.3 and TF3.2 defining the upper boundary. A new tidal-fresh segment (RPPTF) was delineated upstream of this point with the northern extent defined by the limit of tidal influence.

Segments LE4, RET4 and TF4: York River. The tidal York River is formed from the confluence of the tidal Mattaponi and Pamunkey rivers. Tidal-fresh/oligohaline conditions in the headwaters extend to the point of confluence and the York River proper is mesohaline, transitioning to polyhaline by the time it reaches Mobjack Bay. A polyhaline segment (YRKPH) was created extending upstream from a new line at the river mouth to the interpolated salinity cut-off point between station LE4.2 (in YRKPH) and LE4.1 (in YRKMH).[5] At the lower boundary, the original LE4-WE4 segment line was moved eastward to the natural transition point of the river mouth, leaving the SAV beds on the southern rim in the Mobjack Bay segment (MOBPH). The upper boundary of segment YRKMH was delineated at the confluence of the Mattaponi and Pamunkey rivers at West Point Bridge. The segment lines were drawn

[5]A recommendation to move the York River mouth boundary further out to include station WE4.2 was rejected (see discussion of segment WE4, below). A recommendation to divide the polyhaline segment in two at the constriction near Gloucester Point was also rejected. This recommendation was based on SAV distribution: SAV was present below, but sparse above this point. The recommendation was rejected because SAV distribution per se was not a deciding factor, and breaking up salinity zones within water bodies had been rejected in other major tidal tributaries.

at the mouths of each of these tidal rivers to indicate the lower boundaries of their oligohaline segments (MPNOH and PMKOH, respectively). The segment boundary between MPNOH and the new Mattaponi River tidal-fresh segment MPNTF was based on the interpolated line between stations RET4.2 and TF4.4A. The boundary between PMKOH and the new Pamunkey River tidal-fresh segment (PMKTF) was the interpolated line between stations RET4.1 and TF4.2.

Segment WE4: Mobjack Bay. This western embayment is large with influences from the mainstem Chesapeake Bay, the York River, the Poquoson and Back rivers, and several minor tidal tributaries. The segment name was changed to MOBPH; there were no boundary changes except for the York River mouth as described above.[6]

Segments LE5, RET5 and TF5: James and Elizabeth rivers. The tidal James River contains all four salinity regimes. A polyhaline segment (JMSPH) was created extending from the mouth of the river through station LE5.4. The original segment line at the mouth of the river was moved eastward to include station LE5.5 in JMSPH. The original boundary between this region and the Elizabeth River was retained so that station LE5.6 was excluded from JMSPH and included in the Elizabeth River segment. A boundary was drawn at the interpolated line between stations LE5.4 and LE5.3 to create the upper boundary of the new polyhaline segment and lower boundary of the new mesohaline segment JMSMH. A boundary was drawn at the interpolated line between stations LE5.2 and LE5.1 to form the upper boundary of JMSMH and the lower boundary of the new oligohaline segment (JMSOH). The Chickahominy River, which contains a monitoring station and which empties into segment JMSOH is also oligohaline. The Chickahominy River was delineated as a separate new segment, CHKOH. In the mainstem James River, a new tidal-fresh segment JMSTF was created with the boundary between the oligohaline and tidal-fresh region set as the original segment line between RET5 and TF5.

The east, south and west branches of the tidal Elizabeth River converge to a single main channel leading into the tidal James River before discharging to the Chesapeake Bay. Each branch has tidal water quality monitoring stations, as does the mainstem Elizabeth River. The polyhaline and mesohaline salinity zones are monitored for water quality conditions at present. Another tidal tributary, the Lafayette River, enters the Elizabeth near its mouth. A segment line was drawn across the mouth of the Elizabeth River connecting the terminal land extensions on either side of the river. A new polyhaline segment ELIPH containing station LE5.6 and a new mesohaline segment ELIMH containing station ELI2 within the mainstem of the river were delineated, with a boundary established between them at the interpolated

[6]Suggestions were made to divide WE4 in half and to extend the lower York segment bayward another increment to include station WE4.2. Both these suggestions were rejected. The circulation is complex in this region and it is uncertain where to subdivide the water body. Furthermore, the relative influence of the river versus that of the larger water body of Mobjack Bay and the mainstem Chesapeake Bay was not known. It was decided that station WE4.2 needs to be included in any characterization of the Mobjack Bay segment since it represents the York River influence and this segment.

salinity breakpoint. A new separate segment was created for the Lafayette River (LAFMH). Separate new mesohaline segments were created for each branch (EBEMH for the Eastern Branch, SBEMH for the Southern Branch, and WBEMH for the Western Branch) with boundaries delineated at their respective mouths.[7]

Segments CB1 through CB8: mainstem Chesapeake Bay. The Chesapeake Bay contains all four salinity regimes. The segment CB1 boundary was changed to a new line between stations CB2.1 and CB2.2 forming a new tidal-fresh segment CB1TF. A new oligohaline segment CB2OH was created extending from this line to a new segment line between stations CB3.1 and CB3.2.

The mesohaline region extends from this boundary through station CB5.5. Within this region, three new mesohaline segments were created using the subdivisions of the original 1983 segmentation scheme such that the old CB3-CB4 segment line formed the southern boundary of the new segment CB3MH, the old CB4-CB5 line formed the southern boundary of the new segment CB4MH and the old CB5-CB6/CB7 segment lines formed the southern boundary of the new segment CB5MH. The eastern boundary of CB5 (CB5MH) was moved westward as described above for the Tangier Sound region.

The polyhaline region extends from the southern boundary of CB5MH to the mouth of the Chesapeake Bay, including original segments CB6, CB7 and CB8. The EE3-CB7 line at the northeast corner, was moved to follow the deep channel and join the segment line for Pocomoke Sound around Beach Island, so that Beach Island and monitoring station EE3.5 are in CB7PH. The original segmentation (forming the new segments CB6PH, CB7PH and CB8PH) was retained with a few modifications.[8] The western boundaries were revised as mentioned above such that station LE3.6 was removed from CB6PH (see 'Segments TF3, RET3 and LE3' above), LE5.5 was removed from CB8PH (see 'Segments LE5, RET5 and TF5' above) and station CB7.4 at the mouth of the Bay was retained in CB8PH. The boundary line at the mouth of the Chesapeake Bay for segments CB7PH and CB8PH was moved eastward to encompass Fishermans Island.

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[7]In 1997, there was a question whether station ELI2 in ELIMH was mesohaline or polyhaline (mean salinity = 17.9) and, as a consequence, whether the mainstem Elizabeth River should be divided into mesohaline and polyhaline segments or unified into a single polyhaline segment. A decision was made to keep separate mesohaline and polyhaline segments because 1) the two stations (LE5.6 and ELI2) in the mainstem of the river are sampled by two different programs and the results should be treated separately; and 2) there were some exceptions to the strict salinity cutoff points. The salinity record for station ELI2 was only eight years at that time (in contrast to the 12-year record for most other stations) and flows suggested a freshening trend in many rivers. However, this decision was subsequently reversed and the segments were ultimately joined: ELIMH became part of ELIPH. See '2003 Segmentation Scheme'.

[8]The northern monitoring stations in old segments CB6 and CB7 are borderline mesohaline-polyhaline. A recommendation was put forth to group these stations (CB6.1, CB6.2, CB7.1S, CB7.1, CB7.1N and EE3.5) together to form a single segment and to group the rest of the stations in old segments CB6 and CB7 in another segment. Results of an earlier analysis of spatial differences among water quality parameters had suggested a similar grouping, as did the 1985-1996 water quality trends (Magnien et al. 1991). However, acknowledging the east-west gradient, it was decided to keep the four CB6 stations along the western shore as one polyhaline segment, CB6PH, and the CB7 stations (including EE3.5 and excluding CB7.4) along the eastern shore in CB7PH.

chapter IV

2003 Segmentation Scheme

Between 1998 and 2003, a few inadvertent errors in station coordinates and segment lines were discovered and subsequently corrected in the 2003 segmentation (Figure 4). For the most part, the changes were small and undetectable at the scale of the figures in this document. However, discrepancies might show up as small differences in volume, area or perimeter citations for affected segments. In addition, the segmentation scheme was expanded in the Potomac River to incorporate additional below-fall line stations in the tidal Potomac and Anacostia rivers. The details of the changes from the 1998 to 2003 segmentation schemes are described below.

Elizabeth River: Stations in ELIMH were redefined as polyhaline based on salinity data from first sampling (1989 and after) through 2001 and the segment was joined with ELIPH with the segment retaining the name ELIPH (Figure 4). The affected water quality monitoring stations were ELD01, ELE01, ELI2 and ELI3.

James River: Stations LE5.5A and LE5.5B, sampled only in 1994 as part of the Enhanced Monitoring Project, were erroneously assigned to segment JMSPH. They are actually located in CB8PH. Similarly, station TF5.6A was mis-assigned to segment JMSTF. It is actually located in JMSOH (Figure 4).

Mattaponi River: The boundary between segments MPNTF and MPNOH in the Chesapeake Bay Program GIS coverage for the 1998 segmentation scheme was erroneously located such that station TF4.4A appeared to be located in MPNOH. The line was moved so that the station now correctly lies in segment MPNTF (Figure 4).

Choptank River: Similarly, the boundary between segments CHOTF and CHOOH in the Chesapeake Bay Program GIS coverage was erroneously located such that station ET5.1 appeared to be located in CHOTF. The line was moved so that the station now correctly lies in segment CHOOH (Figure 4).

Anacostia River: A new segment for the Anacostia River tidal water quality monitoring stations was created (ANATF) (Figure 4). Anacostia stations previously assigned to segment POTTF (for the Chesapeake Bay Program Watershed modeling

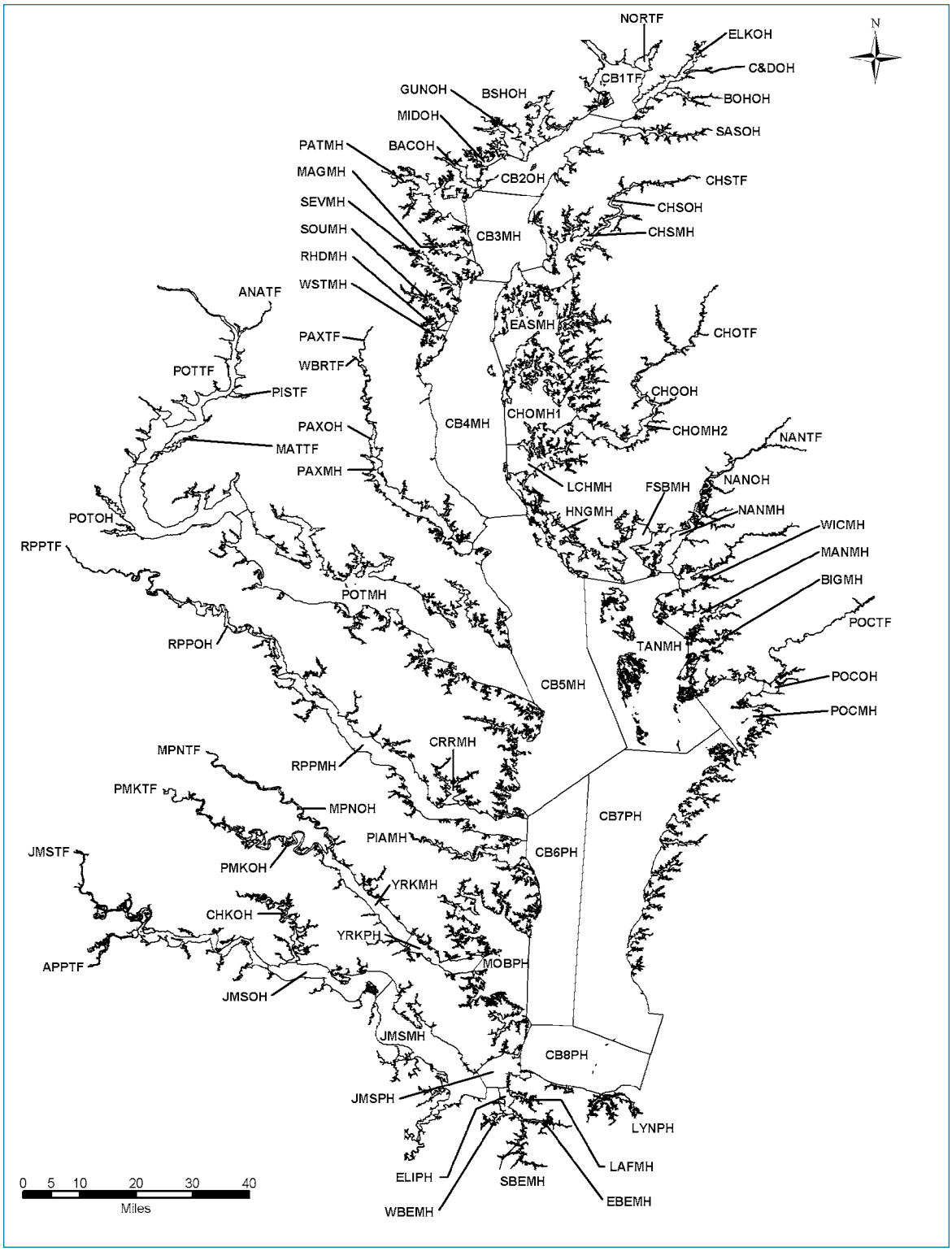

Figure 4. 2003 Chesapeake Bay Program segmentation scheme.

Source: Chesapeake Bay Program.

purposes) were reassigned to ANATF or ANANT (non-tidal reaches of the Anacostia watershed) (Appendix A Table A-1).

Potomac River: Stations located in the tidal Potomac River below the fall line and sampled by agencies of the District of Columbia were assigned to POTTF (Appendix A Table A-1).

SUB-SEGMENTS FOR STATE WATER QUALITY STANDARDS APPLICATIONS

MARYLAND'S SPLIT SEGMENTS FOR SHALLOW WATER BAY GRASS DESIGNATED USE

The Maryland Department of Natural Resources applied the draft water clarity criteria to 1999–2001 SAV habitat conditions and compared the results with the proposed water clarity application depths. They discovered that certain segments, if left in their entirety, could not meet the water clarity criteria even though they already contained substantial amounts of SAV. The SAV was not growing in proximity to the segment's tidal water quality monitoring station and, therefore, the station measurements were not accurately describing in-situ conditions. In other words, the station measurements might have described poor water quality conditions but the abundant SAV in another part of the segment indicated otherwise. Some segments had sizable areas of SAV but their upper tidal portions would support little or no SAV growth due to more localized adverse physical conditions.

Due to these discrepancies, Maryland representatives requested certain Chesapeake Bay Program segments be subdivided in order to establish attainable water clarity standards and SAV restoration goals for those segments. A series of very targeted subdivisions of the 2003 Chesapeake Bay Program segments were made to set even more geographically specific shallow-water designated use boundary delineations based on agreed upon decision rules for determining the application depth for the water clarity criteria to support SAV beds (U.S. EPA 2004).

The segments involved were the Northern Chesapeake Bay (CB1TF), Elk River (ELKOH), Gunpowder River (GUNOH), Sassafras River (SASOH), Upper Potomac River (POTTF), Middle Potomac River (POTOH), Lower Patuxent River (PAXMH), Tangier Sound (TANMH), Manokin River (MANMH) and Big Annemessex River (BIGMH). General subdivision boundaries were assigned. The majority of a given segment was retained, with one or more sections of the segment being partitioned. When actually defining the subdivision boundaries digitally, physical features such as points, mouths of streams, etc. were used as end points wherever possible. In some segments, such as Manokin River and Big Annemessex River, a 'natural break' between an area containing a lot of SAV and an area with little or no SAV was used to guide where the subdivision boundary line was drawn.

The same analyses that were done to ascertain the original water clarity criteria application depths were performed on the new segment subdivisions to assign new application depths (U.S. EPA 2003, 2004). Most of the main portions of those subdivided segments maintained their original water clarity criteria application depths while two (Sassafras River and Lower Patuxent River) had their application depths increased to 1-2 meters in depth. The smaller subdivisions had application depths ranging among all three-depth classes: 0-0.5, >0.5-1 and >1-2 meters.

Figure 5 shows those the Chesapeake Bay Program segments in Maryland tidal waters that were subdivided and their new water clarity criteria application depths. Appendix B Table B-1 lists and spatially defines the subdivided segments.

VIRGINIA'S UPPER JAMES RIVER SPLIT SEGMENT

The James River tidal fresh segment (JMSTF) was sub-divided into an upper segment (JMSTF2) and a lower segment (JMSTF1) for application of new water clarity and chlorophyll *a* water quality standards (U.S. EPA 2004). The upper segment (JMSTF2), which extends from Richmond to Hopewell, is narrower, faster flowing and with much greater average depth. This translates to a lower residence time for algal biomass to develop (i.e., naturally lower chlorophyll *a* levels) as well as less available habitat for SAV. The river widens from approximately 0.4 miles across at the end of segment JMSTF2 to as much as 1.6 miles shortly downriver in the segment JMSTF2 region of Hopewell. The tidal Appomattox River enters the James River here. There are much wider shoals (i.e., greater natural SAV habitat availability), and a greater photic zone area due to the increased width-depth ratio. The greater photic zone area and greater residence time leads to naturally higher chlorophyll *a* levels in JMSTF1.

Figure 6 shows the subdivided upper tidal James River segments and their new water clarity criteria application depths. Appendix B Table B-1 lists and spatially defines the subdivided segments.

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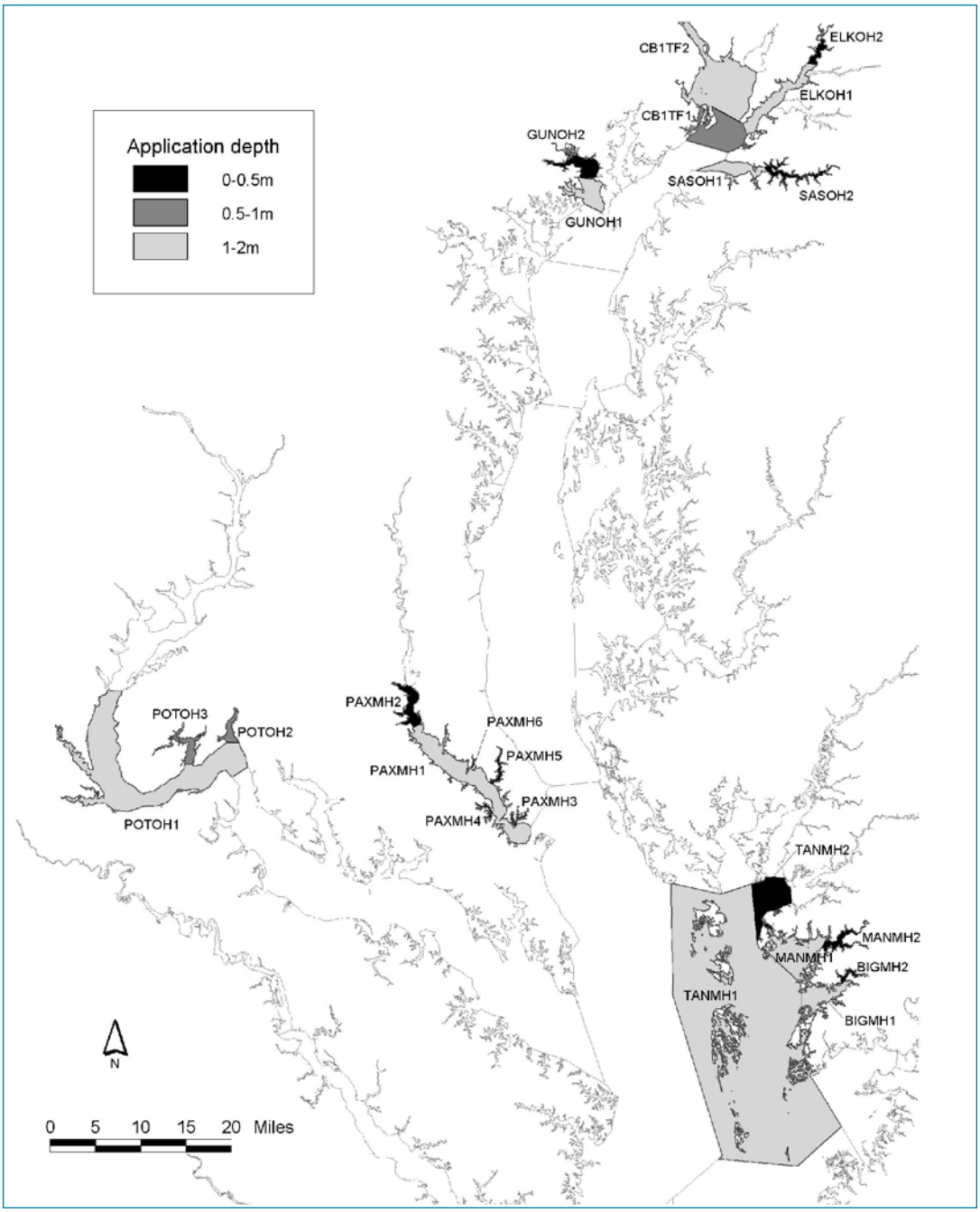

Figure 5. Maryland's split Chesapeake Bay Program segments for the delineation of the shallow-water bay grass designated use and determination of the resultant water clarity application depths.

Source: U.S. EPA 2004.

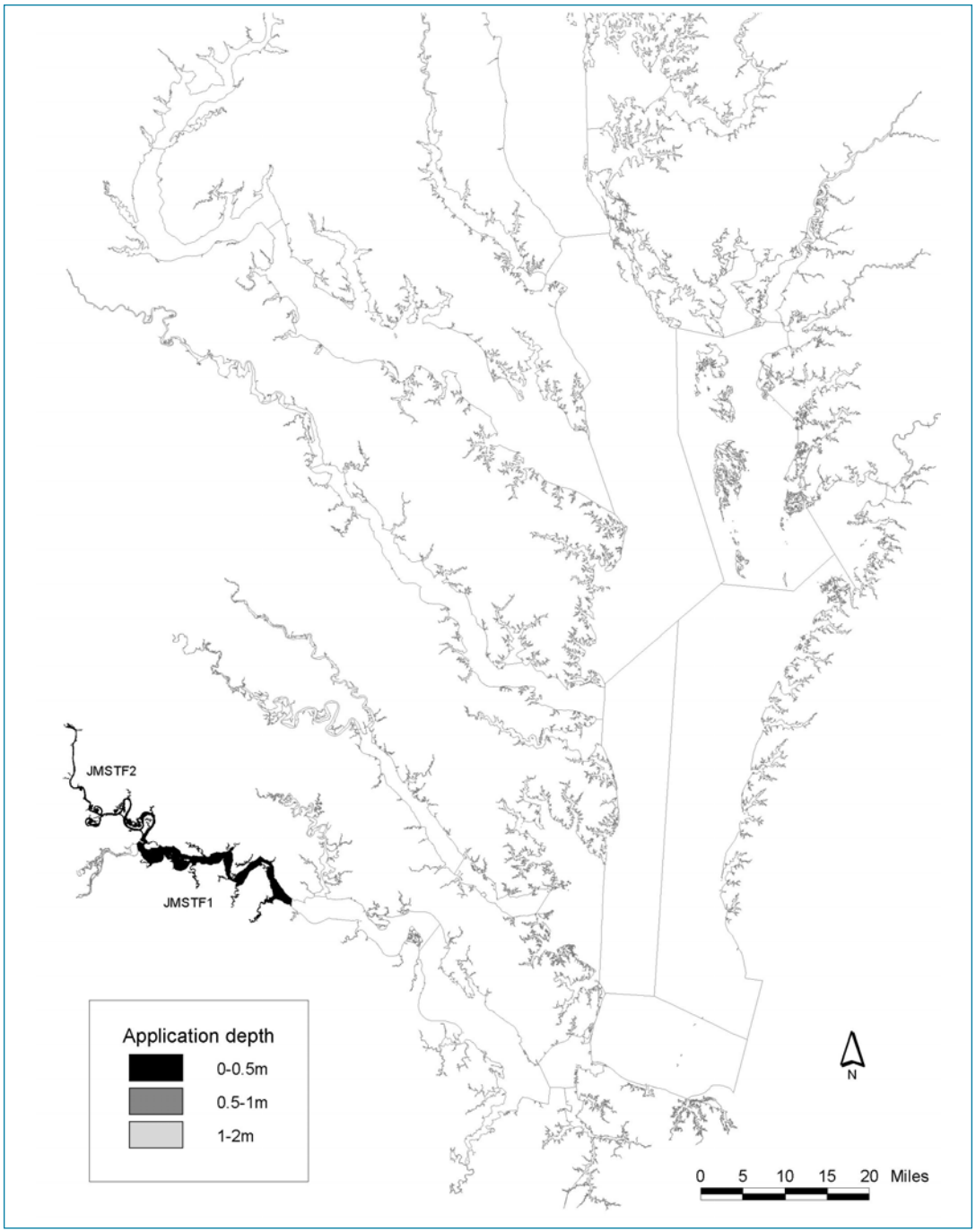

Figure 6. Virginia's split Chesapeake Bay Program segments for the application of water clarity and chlorophyll *a* water quality standards.

Source: U.S. EPA 2004.

chapter V

Information Related to the Segmentation Schemes

MONITORING STATIONS AND PAST/PRESENT SEGMENTATION SCHEMES

Appendix A lists the water quality and biological monitoring stations in the Chesapeake Bay and its tidal tributaries. Table A-1 shows the relationship between the 1983, 1997, 1998, and 2003 segmentation schemes for the mainstem Chesapeake Bay and tidal tributary water quality monitoring stations. Some nontidal stations situated below the fall line also are included, because their data are closely linked to analysis with associated tidal water quality monitoring stations, such as in the St. Mary's, upper Potomac and Anacostia rivers.

Some changes have been made through time to the segment names with regard to the designation between a station that is above the fall line and a nontidal station. In the 1983 segmentation scheme, the AFL segment code was used to label both above fall line and nontidal stations. In the 1998 segmentation scheme, stations above the fall line had a segment code ending in TF (tidal-fresh), even though there was no tidal influence. The 2003 segmentation scheme uses NT (nontidal) as the last two characters of a segment name to denote a station or segment that is not influenced by the tidal flow, e.g., ANANT. Most stations located in an NT segment will be in the above fall line category; however, some are located below the fall line. It is important to note there was no actual GIS segment coverage for the 1985 AFL segments and there is none currently for the 2003 NT segments.

Not all the stations listed in Appendix A Table A-1 have data in the Chesapeake Information Management System's databases through the entire period of record (1984 to present). For example, the east and west mainstem lateral stations are not sampled during the winter months, and some tidal tributary stations were sampled for short-term special projects. In recent years, data from new monitoring projects have been added to the networked series of databases. Data for the last 10 stations listed under Eastern Shore Tributaries and Embayments–Maryland in Table A-1 were added to the database beginning in March 2003. Prior to this, these stations had

been part of the Maryland Pfiesteria monitoring project. Most stations listed under Eastern Shore Tributaries and Embayments–Virginia, were sampled from January 2001 through June 2002, while the Cherrystone Inlet stations were sampled through December 2002. Sampling stopped for all stations on this project after December due to funding restraints. The Indian Head (IH) station data in the Potomac-Mattawoman Creek area were added beginning in April 2000. This is an ongoing project of special interest to SAV restoration. Finally, St. Mary's River data were added beginning in mid-1999, and that project continues at this time. The tidal stations are included in the Potomac segment POTMH. At present, no separate St. Mary's River segment has been defined.

Missing data are flagged with a period (.) in the table. If a Chesapeake Bay Program (CBP) Station or Agency Station value is missing, there were no stations located within that defined segment (e.g. CHSTF, CHOTF, HNGMH, POCOH, LYNPH) during the early years of data collection. Currently one station is being sampled in segment POCOH. A missing segment code value means that no data were in the database for that segment period, or no GIS segment coverage was defined for that area. An exception is segment ANATF for the Anacostia River, which had been listed in the database stations table but did not have an actual GIS coverage. A GIS segment was created for ANATF in the 2003 revision. A missing total depth value is caused by no total depth value being recorded with the data. This happened frequently with very shallow stations.

In Appendix A, water quality monitoring stations are shown on the station maps for Maryland Chesapeake Bay mainstem (Figure A-1), Maryland tidal tributaries (Figure A-2), Virginia Chesapeake Bay mainstem (Figure A-3), Virginia tidal tributaries (Figure A-4), Elizabeth River (Figure A-5), upper Potomac and Anacostia river (Figure A-6) and St. Mary's River (Figure A-7). The complete list of monitoring locations for which data exist in the Chesapeake Information Management System's networked databases is available in the stations table at www.chesapeakebay.net/data/index.htm.

2003 SEGMENTATION STATISTICS

Table 1 contains the perimeter, area and volume statistics for each of the 2003 segmentation scheme's segments. These statistics were calculated using GIS software and the Chesapeake Bay Program Volumetric Interpolator which is currently being revised. Some of these segments were modified in the 2003 update and the old version of the Interpolator does not have the new segment boundaries with which to calculate a new, correct volume. In addition, all segment volumes may be slightly changed when the new version of the Interpolator is completed in 2004. More information about the Interpolator can be found on the Chesapeake Bay Program website, at www.chesapeakebay.net/cims/interpolator.htm.

Table 1. 2003 Chesapeake Bay Program Segments Perimeter, Area and Volume Statistics

2003 Segment	Water Body	Perimeter [meters]	Area [meters^2]	Volume [meters^3]
CB1TF	MAINBAY	216814	151620944	360000000
CB2OH	MAINBAY	246410	275239520	1237000000
CB3MH	MAINBAY	145496	361585728	2391000000
CB4MH	MAINBAY	326788	908849967	9237000000
CB5MH	MAINBAY	842496	1474652418	15416000000
CB6PH	MAINBAY	278815	743353039	6503000000
CB7PH	MAINBAY	956822	1520821583	13523000000
CB8PH	MAINBAY	146606	412427744	3172000000
NORTF	NORTHEAST	40617	15817689	26500000
C&DOH	C&D CANAL	35654	3565828	24130000
BOHOH	BOHEMIA	79964	11927636	17000000
ELKOH	ELK	138710	37270004	101250000
SASOH	SASSAFRAS	161366	33085712	84187500
CHSTF	CHESTER	60350	4084016	3362500
CHSOH	CHESTER	124641	14790537	28875000
CHSMH	CHESTER	363647	119290907	455250000
EASMH	EASTERN BAY	619132	234558868	996750000
CHOTF	CHOPTANK	150022	8906181	15000000 *
CHOOH	CHOPTANK	145797	15037649	45000000 *
CHOMH2	CHOPTANK	206492	74200120	266750000
CHOMH1	CHOPTANK	537319	242057248	945000000
LCHMH	LITTLE CHOPTANK	407700	89578958	208250000
HNGMH	HONGA RIVER	246072	97719184	185680000
FSBMH	FISHING BAY	295582	83505552	143000000
NANTF	NANTICOKE	69276	4608463	6615000
NANOH	NANTICOKE	238038	16455330	45000000
NANMH	NANTICOKE	219270	48357788	97250000
WICMH	WICOMICO	285770	35116516	56420000
MANMH	MANOKIN	275258	60788916	89500000
BIGMH	BIG ANNEMESSEX	162996	29067984	43625000
POCTF	POCOMOKE	77456	3998871	4470000
POCOH	POCOMOKE	116755	13821501	18000000
POCMH	POCOMOKE	483373	195923574	354500000
TANMH	TANGIER SOUND	1046674	897937604	4019000000
BSHOH	BUSH	107046	30542696	49250000
GUNOH	GUNPOWDER	163323	41998392	64250000
MIDOH	MIDDLE	93914	16214070	25000000
BACOH	BACK_MD	64832	16175354	22375000
PATMH	PATAPSCO	339736	93604632	451500000
MAGMH	MAGOTHY	121642	26541486	76500000
SEVMH	SEVERN_MD	153435	29387340	113437500
SOUMH	SOUTH	129040	23982120	67000000
RHDMH	RHODE	43830	9110563	20312500
WSTMH	WEST	58041	11303989	20375000
PAXTF	PATUXENT	55373	4408622	11025000
WBRTF	PATUXENT-WESTRNBRNCH	5181	131511	.
PAXOH	PATUXENT	76397	14243456	27180000
PAXMH	PATUXENT	348050	107580204	561000000
ANATF	ANACOSTIA	37796	3406518	*
PISTF	POTOMAC-PISCATAWAY	15219	3708997	2850000
MATTF	POTOMAC-MATTAWOMAN	37045	7280895	9500000

continued

Table 1. 2003 Chesapeake Bay Program Segments Perimeter, Area and Volume Statistics (cont.).

2003 Segment	Water Body	Perimeter [meters]	Area [meters^2]	Volume [meters^3]
POTTF	POTOMAC	330128	150435104	450000000*
POTOH	POTOMAC	312495	214963696	852250000
POTMH	POTOMAC	1277757	887864640	5792000000
RPPTF	RAPPAHANNOCK	252716	36503308	107437500
RPPOH	RAPPAHANNOCK	112097	19536530	53580000
RPPMH	RAPPAHANNOCK	724298	323830688	1482250000
CRRMH	RAPP-CORROTOMAN	146952	23483608	65687500
PIAMH	PIANKATANK	286397	69774176	201437500
MPNTF	YORK-MATTAPONI	116461	9280244	15000000 *
MPNOH	YORK-MATTAPONI	100741	7952139	35000000 *
PMKTF	YORK-PAMUNKEY	264700	16229024	28630000
PMKOH	YORK-PAMUNKEY	119417	14093807	66680000
YRKMH	YORK	321194	94595793	275500000
YRKPH	YORK	209230	68414728	400750000
MOBPH	MOBJACK BAY	987544	342714372	1342500000
JMSTF	JAMES	562776	95301848	286187500
APPTF	JAMES-APPOMATTOX	168938	8011611	1510000
JMSOH	JAMES	271459	127749032	431500000
CHKOH	JAMES-CHICKAHOMINY	355816	27969270	48562500
JMSMH	JAMES	552699	304241056	977000000
JMSPH	JAMES	120958	76561904	434000000
WBEMH	ELIZ-WESTBRNCH	56237	6006832	6310000
SBEMH	ELIZ-SOUTHBRNCH	171896	8393598	27730000
EBEMH	ELIZ-EASTBRNCH	99682	5774440	6460000
LAFMH	ELIZ-LAFAYETTE	87952	5754146	3390000
ELIPH**	ELIZABETH RIVER	64695	21152682	114890000
LYNPH	LYNNHAVEN	289316	19607176	16730000

Conversions:
Square meters to acres: multiply by 0.0002471054
Square meters to miles: multiply by 0.0000003861003
Meters to miles: multiply by 0.0006213697
Cubic meters to liters: multiply by 1000

Note: For general reporting purposes, the total area of the tidal waters of the Bay and tributaries is 1,166,584 hectares, or 2,881,463 acres; these waters are surrounded by 11,684 miles of shoreline.

*Volume is approximate.
. No bathymetry available for segment WBRTF.
**ELIPH was at one time two segments: ELIMH and ELIPH (see text).The statistics for those segments were:

ELIMH	ELIZABETH RIVER	53103.41	12203789.00	53390000
ELIPH	ELIZABETH RIVER	15760.59	8948893.00	61500000

Source: Chesapeake Bay Program.

SEGMENT BOUNDARY COORDINATES

Comprehensive documentation of the spatial boundaries of individual Chesapeake Bay Program segments was undertaken to satisfy the needs of the Chesapeake Bay Program and its partner jurisdictions. Appendix C provides textual descriptions of the coordinates bounding each of the 78 segments within the 2003 segmentation scheme. Each segment definition contains a series of points that are defined by both a set of latitude and longitude coordinates in decimal degrees and a textual narrative describing their location. The segment boundaries follow the shorelines between the geo-referenced boundary coordinates including within each segment, all tidally influenced waters. Examples of definition points are the two (or more) points delineating the mouth of a river or bay, the farthest upstream point(s) in the segment and points delineating where a segment boundary line changes direction (usually occurring in open-water Chesapeake Bay segments). The number of points used to define the segment boundaries is as few as 2 (LYNPH) and as many as 31 (TANMH) with the majority of segments (47 of 78) having 3 or 4 points.

The order in which points were numbered followed a few simple rules. The first point, whenever possible, was always at the mouth of a river on the side of the mouth so that when proceeding counter-clockwise the second point also helped to define the mouth. The ordering would then proceed counter-clockwise until all points were numbered and defined. Upstream segments (e.g. POTOH and JMSTF) would be ordered in a similar fashion beginning with the downstream line used to define that segment. The mainstem Chesapeake Bay segments (e.g. CB3MH, CB7PH) generally began numbering at their southwestern-most point. Some embayment-like segments (e.g. LYNPH) do not contain upstream points because they lack a clear main feeder stream to act as an upstream terminus.

Digital versions of USGS quad sheets, Delorme state atlases and NOAA navigational charts were used as visual aids in creating the narrative descriptions. When creating the narrative descriptions for the segment delineation points, an existing reference name (e.g. Turkey Point, Travilla Wharf) was used whenever possible. When a point was not at an identifiable location, the description was often given as a distance to an object such as a stream, road, lighthouse, etc. These distances are not absolute but are approximations, subject to the scale of the data and the fact that many of the distance measurements taken were not along a straight line between two points but followed a shoreline or stream.

WEB ACCESS TO SEGMENTATION SCHEMES

The Chesapeake Bay Program partners maintain web access to segmentation schemes at www.chesapeakebay.net where water quality and biological data collected as part of the Chesapeake Bay Program monitoring network are maintained online through the Data Hub. Segment maps for 1998 and 2003 and a map of current

monitoring stations can be located under Maps and Mapping at this website. All the segment maps and monitoring station maps in GIS export format are available at ftp://ftp.chesapeakebay.net/pub/Geographic/ChesapeakeBay. A station table with latitude/longitudes, UTM coordinates, segment codes and other information is located at www.chesapeakebay.net/data/index.htm. Table C-1 in Appendix C is available electronically both as an EXCEL and a text file at www.chesapeakebay.net/segmentscheme.htm.

appendix a

Water Quality Monitoring in Relationship to Past and Present Chesapeake Bay Program Segmentation Schemes

Table A-1. Water quality and biological monitoring stations in Chesapeake Bay and tidal tributaries.

CBP Station	Agency Station	Water Body	Segmentation Scheme				Total Depth	Salinity Regime	Fall Line
			2003	1998	1997	1985			
Eastern Shore Tributaries and Embayments—Maryland									
ET1.1	MET1.1	NORTHEAST	NORTF	NORTF	ET1TF	ET1	2.8	TF	B
ET2.1	MET2.1	C&D CANAL	C&DOH	C&DOH	ET2OH1	ET2	13.0	OH	B
ET2.2	MET2.2	BOHEMIA	BOHOH	BOHOH	ET2OH3	ET2	2.8	OH	B
ET2.3	MET2.3	ELK	ELKOH	ELKOH	ET2OH2	ET2	12.4	OH	B
ET3.1	MET3.1	SASSAFRAS	SASOH	SASOH	ET3OH	ET3	5.9	OH	B
.	.	CHESTER	CHSTF	CHSTF	ET4TF	ET4	.	TF	B
ET4.1	MET4.1	CHESTER	CHSOH	CHSOH	ET4OH	ET4	5.5	OH	B
ET4.2	MET4.2	CHESTER	CHSMH	CHSMH	ET4MH	ET4	14.2	MH	B
XGG8251	XGG8251	CHESTER	CHSMH	CHSMH	ET4MH	ET4	5.6	MH	B
EE1.1	MEE1.1	EASTERN BAY	EASMH	EASMH	EE1MH	EE1	12.7	MH	B
.	.	CHOPTANK	CHOTF	CHOTF	ET5TF	ET5	.	TF	B
ET5.1	MET5.1	CHOPTANK	CHOOH	CHOOH	ET5OH	ET5	6.2	OH	B
ET5.2	MET5.2	CHOPTANK	CHOMH2	CHOMH2	ET5MH	ET5	11.9	MH	B
EE2.1	MEE2.1	CHOPTANK	CHOMH1	CHOMH1	EE2MH1	EE2	7.7	MH	B
EE2.2	MEE2.2	LITTLE CHOPTANK	LCHMH	LCHMH	EE2MH2	EE2	13.1	MH	B
.	.	HONGA	HNGMH	HNGMH	EE3MH	EE3	.	MH	B
EE3.0	MEE3.0	FISHING BAY	FSBMH	FSBMH	EE3MH	EE3	7.3	MH	B
ET6.1	MET6.1	NANTICOKE	NANTF	NANTF	ET6TF	ET6	5.0	TF	B
.	.	NANTICOKE	NANOH	NANOH	ET6OH	ET6	.	OH	B
ET6.2	MET6.2	NANTICOKE	NANMH	NANMH	ET6MH	ET6	3.9	MH	B
ET7.1	MET7.1	WICOMICO	WICMH	WICMH	ET7MH	ET7	6.8	MH	B
ET8.1	MET8.1	MANOKIN	MANMH	MANMH	ET8MH	ET8	5.3	MH	B
ET9.1	MET9.1	BIG ANNEMESSEX	BIGMH	BIGMH	ET9MH	ET9	4.9	MH	B
ET10.1	MET10.1	POCOMOKE	POCTF	POCTF	ET10TF	ET10	5.7	TF	B
.	.	POCOMOKE	POCOH	POCOH	ET10OH	ET10	.	OH	B
EE3.3	MEE3.3	POCOMOKE	POCMH	POCMH	EE3MH	EE3	3.9	MH	B
EE3.4	EE3.1	POCOMOKE	POCMH	POCMH	EE3MH	EE3	4.8	MH	B
EE3.1	MEE3.1	TANGIER SOUND	TANMH	TANMH	EE3MH	EE3	13.1	MH	B
EE3.2	MEE3.2	TANGIER SOUND	TANMH	TANMH	EE3MH	EE3	27.1	MH	B
BXK0031	BXK0031	MANOKIN	.	.	.	.	2.7	MH	B
CCM0069	CCM0069	CHICAMACOMICO	.	.	.	.	2.2	OH	B
MNK0146	MNK0146	MANOKIN	.	.	.	.	4.6	OH	B
POK0087	POK0087	POCOMOKE	POCTF	.	.	.	1.2	TF	B

TRQ0088	TRQ0088	TRANSQUAKING	.	.	.	.	2.5	OH	B
TRQ0146	TRQ0146	TRANSQUAKING	.	.	.	.	2.1	TF	B
WIW0141	WIW0141	WICOMICO	.	.	.	.	.	TF	B
XAK7810	XAK7810	POCOMOKE	POCOH	.	.	.	3.7	OH	B
XCI4078	XCI4078	WICOMICO	WICMH	.	.	.	4.1	MH	B
XDJ9007	XDJ9007	NANTICOKE	NANTF	.	.	.	2.1	TF	B
Eastern Shore Tributaries and Embayments—Virginia									
C-1	C-1	CHERRYSTONE INLET	CB7PH	.	.	.	.	PH	B
C-2	C-2	CHERRYSTONE INLET	CB7PH	.	.	.	.	PH	B
C-3	C-3	CHERRYSTONE INLET	CB7PH	.	.	.	.	PH	B
CS-3	CS-3	CHESCONESSEX CREEK	CB7PH	.	.	.	.	PH	B
H-1	H-1	HUNGARS CREEK	CB7PH	.	.	.	.	PH	B
H-1A	H-1A	HUNGARS CREEK	CB7PH	.	.	.	.	PH	B
H-2	H-2	HUNGARS CREEK	CB7PH	.	.	.	.	PH	B
H-3	H-3	HUNGARS CREEK	CB7PH	.	.	.	.	PH	B
OC-3	OC-3	OCCOHANNOCK CREEK	CB7PH	.	.	.	.	PH	B
ON-3	ON-3	ONANCOCK CREEK	CB7PH	.	.	.	.	PH	B
OP-1	OP-1	OLD PLANTATION CREEK CB7PH	.	.	.	.	PH	B	
OP-2	OP-2	OLD PLANTATION CREEK CB7PH	.	.	.	.	PH	B	
OP-3	OP-3	OLD PLANTATION CREEK CB7PH	.	.	.	.	PH	B	
Chesapeake Bay Mainstem									
CB1.1	MCB1.1	MAINBAY	CB1TF	CB1TF	CB1TF	CB1	6.1	TF	B
CB2.1	MCB2.1	MAINBAY	CB1TF	CB1TF	CB1TF	CB2	6.2	TF	B
CB2.2	MCB2.2	MAINBAY	CB2OH	CB2OH	CB2OH	CB2	12.4	OH	B
CB3.1	MCB3.1	MAINBAY	CB2OH	CB2OH	CB2OH	CB3	12.9	OH	B
CB3.2	MCB3.2	MAINBAY	CB3MH	CB3MH	CB3MH	CB3	12.1	MH	B
CB3.3C	XHF1373	MAINBAY	CB3MH	CB3MH	CB3MH	CB3	24.3	MH	B
CB3.3C	MCB3.3C	MAINBAY	CB3MH	CB3MH	CB3MH	CB3	24.3	MH	B
CB3.3E	MCB3.3E	MAINBAY	CB3MH	CB3MH	CB3MH	CB3	8.4	MH	B
CB3.3W	MCB3.3W	MAINBAY	CB3MH	CB3MH	CB3MH	CB3	9.0	MH	B
CB4.1C	MCB4.1C	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	32.2	MH	B
CB4.1E	MCB4.1E	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	23.4	MH	B
CB4.1W	MCB4.1W	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	9.3	MH	B
CB4.2C	MCB4.2C	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	27.2	MH	B
CB4.2E	MCB4.2E	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	9.5	MH	B
CB4.2W	MCB4.2W	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	9.4	MH	B

continued

Table A-1. Water quality and biological monitoring stations in Chesapeake Bay and tidal tributaries (cont.).

CBP Station	Agency Station	Water Body	Segmentation Scheme				Total Depth	Salinity Regime	Fall Line
			2003	1998	1997	1985			
CB4.3C	MCB4.3C	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	26.8	MH	B
CB4.3E	MCB4.3E	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	22.4	MH	B
CB4.3W	MCB4.3W	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	9.8	MH	B
CB4.4	MCB4.4	MAINBAY	CB4MH	CB4MH	CB4MH	CB4	30.2	MH	B
CB5.1	MCB5.1	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	34.3	MH	B
CB5.1W	XCF9575	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	9.1	MH	B
CB5.2	MCB5.2	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	30.6	MH	B
CB5.3	MCB5.3	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	26.9	MH	B
CB5.4	CB5.4	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	32.0	MH	B
CB5.4W	CB5.4W	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	5.2	MH	B
CB5.5	CB5.5	MAINBAY	CB5MH	CB5MH	CB5MH	CB5	18.4	MH	B
CB6.1	CB6.1	MAINBAY	CB6PH	CB6PH	CB6PH	CB6	12.8	PH	B
CB6.2	CB6.2	MAINBAY	CB6PH	CB6PH	CB6PH	CB6	10.9	PH	B
CB6.3	CB6.3	MAINBAY	CB6PH	CB6PH	CB6PH	CB6	12.3	PH	B
CB6.4	8	MAINBAY	CB6PH	CB6PH	CB6PH	CB6	10.4	PH	B
CB7.1	CB7.1	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	23.8	PH	B
CB7.1N	CB7.1N	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	28.8	PH	B
CB7.1S	CB7.1S	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	15.3	PH	B
CB7.2	CB7.2	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	21.5	PH	B
CB7.2E	CB7.2E	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	13.2	PH	B
CB7.3	6	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	13.6	PH	B
CB7.3E	7	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	17.9	PH	B
CB7.4N	5	MAINBAY	CB7PH	CB7PH	CB7PH	CB7	12.9	PH	B
EE3.5	EE3.2	TANGIER	CB7PH	CB7PH	CB7PH	CB7	25.8	PH	B
CB7.4	4	MAINBAY	CB8PH	CB8PH	CB8PH	CB8	14.2	PH	B
CB8.1	2	MAINBAY	CB8PH	CB8PH	CB8PH	CB8	9.9	PH	B
CB8.1E	3	MAINBAY	CB8PH	CB8PH	CB8PH	CB8	17.0	PH	B
LE5.5A	LE5.5A	MAINBAY	CB8PH	JMSPH	JMSPH	LE5	3.3	PH	B
LE5.5B	LE5.5B	MAINBAY	CB8PH	JMSPH	JMSPH	LE5	2.1	PH	B
.	.	LYNNHAVEN	LYNPH	LYNPH	CB8	CB8	.	PH	B
Western Shore Tributaries and Embayments—District of Columbia									
TDU01	TDU01	ANACOSTIA	ANANT	ANATF	ANATF	AFL	.	NT	B
TFC01	TFC01	UT-ANACOSTIA RIVER	ANANT	ANATF	ANATF	AFL	.	NT	B

TFD01	TFD01	UT-ANACOSTIA RIVER	ANANT	ANATF	ANATF	AFL	.	NT	B
TFS01	TFS01	UT-ANACOSTIA RIVER	ANANT	ANATF	ANATF	AFL	.	NT	B
THR01	THR01	HICKORY RUN	ANANT	ANATF	ANATF	AFL	.	NT	B
TNA01	TNA01	NASH RUN	ANANT	ANATF	ANATF	AFL	.	NT	B
TTX27	TTX27	UT-ANACOSTIA RIVER	ANANT	ANATF	ANATF	AFL	.	NT	B
TUT01	TUT01	UT-ANACOSTIA RIVER	ANANT	ANATF	ANATF	AFL	.	NT	B
TWB01	TWB01	WATTS BRANCH	ANANT	ANATF	ANATF	AFL	.	NT	B
TWB02	TWB02	WATTS BRANCH	ANANT	ANATF	ANATF	AFL	.	NT	B
TWB03	TWB03	WATTS BRANCH	ANANT	ANATF	ANATF	AFL	.	NT	B
TWB04	TWB04	WATTS BRANCH	ANANT	ANATF	ANATF	AFL	.	NT	B
TWB05	TWB05	WATTS BRANCH	ANANT	ANATF	ANATF	AFL	.	NT	B
TWB06	TWB06	WATTS BRANCH	ANANT	ANATF	ANATF	AFL	.	NT	B
AAG01	AAG01	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
AAG02	AAG02	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA01	ANA01	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA02	ANA02	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA03	ANA03	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA04	ANA04	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA05	ANA05	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA06	ANA06	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA07	ANA07	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA08	ANA08	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA09	ANA09	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA10	ANA10	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA11	ANA11	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA12	ANA12	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA13	ANA13	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA14	ANA14	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA15	ANA15	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA16	ANA16	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA17	ANA17	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA18	ANA18	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA19	ANA19	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA20	ANA20	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA21	ANA21	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA22	ANA22	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA23	ANA23	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA24	ANA24	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B

continued

Table A-1. Water quality and biological monitoring stations in Chesapeake Bay and tidal tributaries (cont.).

CBP Station	Agency Station	Water Body	Segmentation Scheme				Total Depth	Salinity Regime	Fall Line
			2003	1998	1997	1985			
ANA25	ANA25	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA26	ANA26	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA27	ANA27	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA29	ANA29	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
ANA30	ANA30	ANACOSTIA	ANATF	ANATF	ANATF	AFL	.	TF	B
KNG01	KNG01	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
KNG02	KNG02	ANACOSTIA	ANATF	ANATF	ANATF	TF2	.	TF	B
PTB01	PTB01	TIDAL BASIN	ANATF	POTTF	POTTF	TF2	.	TF	B
PWC04	PWC04	WASHINGTON CHANNEL	ANATF	POTTF	POTTF	TF2	.	TF	B
TPB01	TPB01	POPE BRANCH	ANATF	ANATF	ANATF	AFL	.	TF	B
PMS01	PMS01	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS02	PMS02	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS03	PMS03	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS05	PMS05	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS07	PMS07	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS08	PMS08	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS09	PMS09	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	A
PMS10	PMS10	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS11	PMS11	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS12	PMS12	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS13	PMS13	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS16	PMS16	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS18	PMS18	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS21	PMS21	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS23	PMS23	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS25	PMS25	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS27	PMS27	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS29	PMS29	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS31	PMS31	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS33	PMS33	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS35	PMS35	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS37	PMS37	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS39	PMS39	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS41	PMS41	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B

PMS44	PMS44	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS46	PMS46	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS48	PMS48	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
PMS51	PMS51	POTOMAC	POTTF	POTTF	POTTF	TF2	.	TF	B
TOR01	TOR01	OXON RUN	POTTF	POTTF	POTTF	AFL	.	TF	B

Western Shore Tributaries and Embayments—Maryland

WT1.1	MWT1.1	BUSH	BSHOH	BSHOH	WT1OH	WT1	2.3	OH	B
WT2.1	MWT2.1	GUNPOWDER	GUNOH	GUNOH	WT2OH	WT2	1.9	OH	B
WT3.1	MWT3.1	MIDDLE	MIDOH	MIDOH	WT3OH	WT3	3.7	OH	B
WT4.1	MWT4.1	BACK_MD	BACOH	BACOH	WT4OH	WT4	1.7	OH	B
WT5.1	MWT5.1	PATAPSCO	PATMH	PATMH	WT5MH	WT5	15.1	MH	B
WT6.1	MWT6.1	MAGOTHY	MAGMH	MAGMH	WT6MH	WT6	5.5	MH	B
WT7.1	MWT7.1	SEVERN_MD	SEVMH	SEVMH	WT7MH	WT7	9.1	MH	B
WT8.1	MWT8.1	SOUTH	SOUMH	SOUMH	WT8MH1	WT8	8.9	MH	B
WT8.2	MWT8.2	RHODE	RHDMH	RHDMH	WT8MH2	WT8	2.6	MH	B
WT8.3	MWT8.3	WEST	WSTMH	WSTMH	WT8MH3	WT8	3.3	MH	B
TF1.3	PXT0494	PATUXENT	PAXTF	PAXTF	PAXTF1	TF1	2.8	TF	B
TF1.4	PXT0456	PATUXENT	PAXTF	PAXTF	PAXTF1	TF1	2.2	TF	B
TF1.5	PXT0402	PATUXENT	PAXTF	PAXTF	PAXTF1	TF1	10.6	TF	B
TF1.2	WXT0045	PATUXENT-WESTRNBRNCH WBRTF	WBRTF	PAXTF2	TF1	1.9	TF	B	
WXT0001	WXT0001	PATUXENT-WESTRNBRNCH WBRTF	WBRTF	PAXTF2	TF1	1.2	TF	B	
TF1.6	XED9490	PATUXENT	PAXOH	PAXOH	PAXOH	TF1	6.2	OH	B
TF1.7	XED4892	PATUXENT	PAXOH	PAXOH	PAXOH	TF1	2.9	OH	B
LE1.1	XDE5339	PATUXENT	PAXMH	PAXMH	PAXMH	LE1	12.1	MH	B
LE1.2	XDE2792	PATUXENT	PAXMH	PAXMH	PAXMH	LE1	17.1	MH	B
LE1.3	XDF0407	PATUXENT	PAXMH	PAXMH	PAXMH	LE1	23.4	MH	B
LE1.4	XCF8747	PATUXENT	PAXMH	PAXMH	PAXMH	LE1	15.3	MH	B
RET1.1	XDE9401	PATUXENT	PAXMH	PAXMH	PAXMH	RET1	11.2	MH	B
TF2.1	XFB2470	POTOMAC	POTTF	POTTF	POTTF1	TF2	19.0	TF	B
TF2.2	XFB1433	POTOMAC	POTTF	POTTF	POTTF1	TF2	8.3	TF	B
TF2.3	XEA6596	POTOMAC	POTTF	POTTF	POTTF1	TF2	12.8	TF	B
TF2.4	XEA1840	POTOMAC	POTTF	POTTF	POTTF1	TF2	8.9	TF	B
PIS0033	PIS0033	POTOMAC-PISCATAWAY	PISTF	PISTF	POTTF3	AFL	0.0	TF	B
XFB1986	XFB1986	POTOMAC-PISCATAWAY	PISTF	PISTF	POTTF3	AFL	1.4	TF	B
MAT0016	MAT0016	POTOMAC-MATTAWOMAN	MATTF	MATTF	POTTF2	TF2	6.8	TF	B
MAT0078	MAT0078	POTOMAC-MATTAWOMAN	MATTF	MATTF	POTTF2	TF2	.	TF	B
IH1	IH1	POTOMAC	POTTF	POTTF	.	.	1.3	TF	B

continued

Table A-1. Water quality and biological monitoring stations in Chesapeake Bay and tidal tributaries (cont.).

CBP Station	Agency Station	Water Body	Segmentation Scheme				Total Depth	Salinity Regime	Fall Line
			2003	1998	1997	1985			
IH2	IH2	POTOMAC-MATTAWOMAN	MATTF	MATTF	.	.	1.3	TF	B
IH3	IH3	POTOMAC	POTTF	POTTF	.	.	1.4	TF	B
IH4	IH4	POTOMAC-CHICAMUXEN	POTTF	POTTF	.	.	1.2	TF	B
IH5	IH5	POTOMAC-MATTAWOMAN	MATTF	MATTF	.	.	1.2	TF	B
IH6	IH6	POTOMAC-CHICAMUXEN	POTTF	POTTF	.	.	1.0	TF	B
RET2.1	XDA4238	POTOMAC	POTOH	POTOH	POTOH	RET2	7.3	OH	B
RET2.2	XDA1177	POTOMAC	POTOH	POTOH	POTOH	RET2	10.1	OH	B
RET2.3	XDB3321	POTOMAC	POTOH	POTOH	POTOH	RET2	9.1	OH	B
LE2.2	MLE2.2	POTOMAC	POTMH	POTMH	POTMH	LE2	11.9	MH	B
LE2.3	MLE2.3	POTOMAC	POTMH	POTMH	POTMH	LE2	20.1	MH	B
RET2.4	XDC1706	POTOMAC	POTMH	POTMH	POTMH	RET2	15.8	MH	B
SMNT01	SMNT01	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT02	SMNT02	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT03	SMNT03	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT04	SMNT04	ST MARY'S	POTNT	POTTF	.	.	1.0	NT	B
SMNT05	SMNT05	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT06	SMNT06	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT07	SMNT07	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT08	SMNT08	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT09	SMNT09	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT09.5	SMNT09.5	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT10	SMNT10	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT11	SMNT11	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT12	SMNT12	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT13	SMNT13	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMNT14	SMNT14	ST MARY'S	POTNT	POTTF	.	.	.	NT	B
SMSMC	SMSMC	ST MARY'S	POTNT	POTTF	.	.	5.8	NT	B
SMT01	SMT01	ST MARY'S	POTMH	POTMH	.	.	.7	MH	B
SMT02	SMT02	ST MARY'S	POTMH	POTMH	.	.	2.8	MH	B
SMT03	SMT03	ST MARY'S	POTMH	POTMH	.	.	4.6	MH	B
SMT04	SMT04	ST MARY'S	POTMH	POTMH	.	.	7.2	MH	B
SMT05	SMT05	ST MARY'S	POTMH	POTMH	.	.	7.3	MH	B
SMT06	SMT06	ST MARY'S	POTMH	POTMH	.	.	7.7	MH	B
SMT07	SMT07	ST MARY'S	POTMH	POTMH	.	.	8.3	MH	B

SMT08	SMT08	ST MARY'S	POTMH	POTMH	.	.	2.8	MH	B
SMT09	SMT09	ST MARY'S	POTMH	POTMH	.	.	1.3	MH	B
SMT10	SMT10	ST MARY'S	POTMH	POTMH	.	.	3.6	MH	B
SMT10A	SMT10A	ST MARY'S	POTMH	POTMH	.	.	1.9	MH	B
SMT10B	SMT10B	ST MARY'S	POTMH	POTMH	.	.	1.3	MH	B
SMT11	SMT11	ST MARY'S	POTMH	POTMH	.	.	2.1	MH	B

Western Shore Tributaries and Embayments—Virginia

TF3.1A	TF3.1A	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	3.2	TF	B
TF3.1B	TF3.1B	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	3.5	TF	B
TF3.1C	TF3.1C	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	5.0	TF	B
TF3.1D	TF3.1D	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	3.1	TF	B
TF3.1E	TF3.1E	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	3.5	TF	B
TF3.2	TF3.2	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	6.6	TF	B
TF3.2A	TF3.2A	RAPPAHANNOCK	RPPTF	RPPTF	RAPTF	TF3	5.7	TF	B
TF3.3	TF3.3	RAPPAHANNOCK	RPPOH	RPPOH	RAPOH	TF3	6.9	OH	B
LE3.1	LE3.1	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	6.5	MH	B
LE3.2	LE3.2	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	14.4	MH	B
LE3.2N	LE3.2N	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	.	MH	B
LE3.2S	LE3.2S	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	.	MH	B
LE3.4	LE3.4	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	13.5	MH	B
LE3.6	LE3.6	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	9.8	MH	B
LE3.6N	LE3.6N	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	3.8	MH	B
LE3.6S	LE3.6S	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH2	LE3	4.1	MH	B
RET3.1	RET3.1	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH1	RET3	5.6	MH	B
RET3.1N	RET3.1N	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH1	RET3	.	MH	B
RET3.1S	RET3.1S	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH1	RET3	.	MH	B
RET3.2	RET3.2	RAPPAHANNOCK	RPPMH	RPPMH	RAPMH1	RET3	4.7	MH	B
LE3.3	LE3.3	RAPP-CORROTOMAN	CRRMH	CRRMH	RAPMH3	LE3	5.3	MH	B
LE3.7	LE3.7	PIANKATANK	PIAMH	PIAMH	WT9MH	LE3	7.2	MH	B
TF4.4	TF4.4	YORK-MATTAPONI	MPNTF	MPNTF	YRKTF1	TF4	3.0	TF	B
TF4.4A	TF4.4A	YORK-MATTAPONI	MPNTF	MPNTF	YRKTF1	TF4	6.4	TF	B
RET4.2	RET4.2	YORK-MATTAPONI	MPNOH	MPNOH	YRKOH1	RET4	13.0	OH	B
TF4.1A	TF4.1A	YORK-PAMUNKEY	PMKTF	PMKTF	YRKTF2	TF4	5.4	TF	B
TF4.2	TF4.2	YORK-PAMUNKEY	PMKTF	PMKTF	YRKTF2	TF4	6.7	TF	B
RET4.1	RET4.1	YORK-PAMUNKEY	PMKOH	PMKOH	YRKOH2	RET4	5.4	OH	B
LE4.1	LE4.1	YORK	YRKMH	YRKMH	YRKMH	LE4	8.8	MH	B
RET4.3	RET4.3	YORK	YRKMH	YRKMH	YRKMH	RET4	5.4	MH	B

continued

Table A-1. Water quality and biological monitoring stations in Chesapeake Bay and tidal tributaries (cont.).

CBP Station	Agency Station	Water Body	Segmentation Scheme				Total Depth	Salinity Regime	Fall Line
			2003	1998	1997	1985			
RET4.3N	RET4.3N	YORK	YRKMH	YRKMH	YRKMH	RET4	.	MH	B
RET4.3S	RET4.3S	YORK	YRKMH	YRKMH	YRKMH	RET4	.	MH	B
LE4.2	LE4.2	YORK	YRKPH	YRKPH	YRKPH	LE4	13.8	PH	B
LE4.2N	LE4.2N	YORK	YRKPH	YRKPH	YRKPH	LE4	.	PH	B
LE4.2S	LE4.2S	YORK	YRKPH	YRKPH	YRKPH	LE4	.	PH	B
LE4.3	LE4.3	YORK	YRKPH	YRKPH	YRKPH	LE4	16.0	PH	B
LE4.3N	LE4.3N	YORK	YRKPH	YRKPH	YRKPH	LE4	.	PH	B
LE4.3S	LE4.3S	YORK	YRKPH	YRKPH	YRKPH	LE4	.	PH	B
WE4.1	WE4.1	MOBJACK BAY	MOBPH	MOBPH	WE4PH	WE4	5.9	PH	B
WE4.2	WE4.2	MOBJACK-YORK	MOBPH	MOBPH	WE4PH	WE4	13.6	PH	B
WE4.2N	WE4.2N	MOBJACK-YORK	MOBPH	MOBPH	WE4PH	WE4	4.0	PH	B
WE4.2S	WE4.2S	MOBJACK-YORK	MOBPH	MOBPH	WE4PH	WE4	3.4	PH	B
WE4.3	WE4.3	MOBJACK-POQUOSON	MOBPH	MOBPH	WE4PH	WE4	5.6	PH	B
WE4.4	WE4.4	MOBJACK-BACK_VA	MOBPH	MOBPH	WE4PH	WE4	7.1	PH	B
TF5.2	TF5.2	JAMES	JMSTF	JMSTF	JMSTF1	TF5	2.6	TF	B
TF5.2A	TF5.2A	JAMES	JMSTF	JMSTF	JMSTF1	TF5	8.1	TF	B
TF5.3	TF5.3	JAMES	JMSTF	JMSTF	JMSTF1	TF5	10.7	TF	B
TF5.5	TF5.5	JAMES	JMSTF	JMSTF	JMSTF1	TF5	9.2	TF	B
TF5.5A	TF5.5A	JAMES	JMSTF	JMSTF	JMSTF1	TF5	8.7	TF	B
TF5.5AN	TF5.5AN	JAMES	JMSTF	JMSTF	JMSTF1	TF5	.	TF	B
TF5.5AS	TF5.5AS	JAMES	JMSTF	JMSTF	JMSTF1	TF5	.	TF	B
TF5.6	TF5.6	JAMES	JMSTF	JMSTF	JMSTF1	TF5	9.6	TF	B
TF5.4	TF5.4	JAMES-APPOMATTOX	APPTF	APPTF	JMSTF2	TF5	6.3	TF	B
LE5.1	LE5.1	JAMES	JMSOH	JMSOH	JMSOH1	LE5	9.4	OH	B
RET5.2	RET5.2	JAMES	JMSOH	JMSOH	JMSOH1	RET5	9.2	OH	B
RET5.2N	RET5.2N	JAMES	JMSOH	JMSOH	JMSOH1	RET5	.	OH	B
RET5.2S	RET5.2S	JAMES	JMSOH	JMSOH	JMSOH1	RET5	.	OH	B
TF5.6A	TF5.6A	JAMES	JMSOH	JMSTF	JMSTF1	TF5	7.8	OH	B
RET5.1	RET5.1	JAMES-CHICKAHOMINY	CHKOH	CHKOH	JMSOH2	RET5	2.1	OH	B
RET5.1A	RET5.1A	JAMES-CHICKAHOMINY	CHKOH	CHKOH	JMSOH2	RET5	3.8	OH	B
LE5.2	LE5.2	JAMES	JMSMH	JMSMH	JMSMH	LE5	8.6	MH	B
LE5.2N	LE5.2N	JAMES	JMSMH	JMSMH	JMSMH	LE5	.	MH	B
LE5.2S	LE5.2S	JAMES	JMSMH	JMSMH	JMSMH	LE5	.	MH	B
LE5.3	LE5.3	JAMES	JMSMH	JMSMH	JMSMH	LE5	6.9	MH	B

ELI1	ELI1	ELIZABETH	JMSPH	JMSPH	JMSPH	LE5	8.0	PH	B
LE5.4	LE5.4	JAMES	JMSPH	JMSPH	JMSPH	LE5	15.8	PH	B
LE5.5	1	JAMES	JMSPH	JMSPH	JMSPH	LE5	16.4	PH	B
WBB05	WBB05	ELIZ-WESTBRNCH	WBEMH	WBEMH	WT10PH	LE5	.	MH	B
WBE1	WBE1	ELIZ-WESTBRNCH	WBEMH	WBEMH	WT10PH	LE5	4.4	MH	B
SBA1	SBA1	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	12.2	MH	B
SBC1	SBC1	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	11.4	MH	B
SBD1	SBD1	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	11.8	MH	B
SBD4	SBD4	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	3.3	MH	B
SBE1	SBE1	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	12.3	MH	B
SBE2	SBE2	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	12.4	MH	B
SBE3	SBE3	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	9.3	MH	B
SBE4	SBE4	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	9.8	MH	B
SBE5	SBE5	ELIZ-SOUTHBRNCH	SBEMH	SBEMH	WT10PH	LE5	8.4	MH	B
EBB01	EBB01	ELIZ-EASTBRNCH	EBEMH	EBEMH	.	.	6.9	MH	B
EBE1	EBE1	ELIZ-EASTBRNCH	EBEMH	EBEMH	WT10PH	LE5	8.5	MH	B
EBE1-E	EBE1-E	ELIZ-EASTBRNCH	EBEMH	EBEMH	.	.	8.5	MH	B
EBE2	EBE2	ELIZ-EASTBRNCH	EBEMH	EBEMH	WT10PH	LE5	9.3	MH	B
ELD01	ELD01	ELIZABETH	ELIPH	ELIMH	WT10PH	LE5	.	PH	B
ELI2	ELI2	ELIZABETH	ELIPH	ELIMH	WT10PH	LE5	13.3	PH	B
LAF1	LAF1	ELIZ-LAFAYETTE	LAFMH	LAFMH	WT10PH	LE5	5.8	MH	B
LFA01	LFA01	ELIZ-LAFAYETTE	LAFMH	LAFMH	WT10PH	LE5	.	MH	B
LFB01	LFB01	ELIZ-LAFAYETTE	LAFMH	LAFMH	WT10PH	LE5	.	MH	B
ELE01	ELE01	ELIZABETH	ELIPH	ELIMH	WT10PH	LE5	.	PH	B
ELI3	ELI3	ELIZABETH	ELIPH	ELIMH	WT10PH	LE5	12.8	PH	B
LE5.6	LE5.6	ELIZABETH	ELIPH	ELIPH	WT10PH	LE5	15.1	PH	B

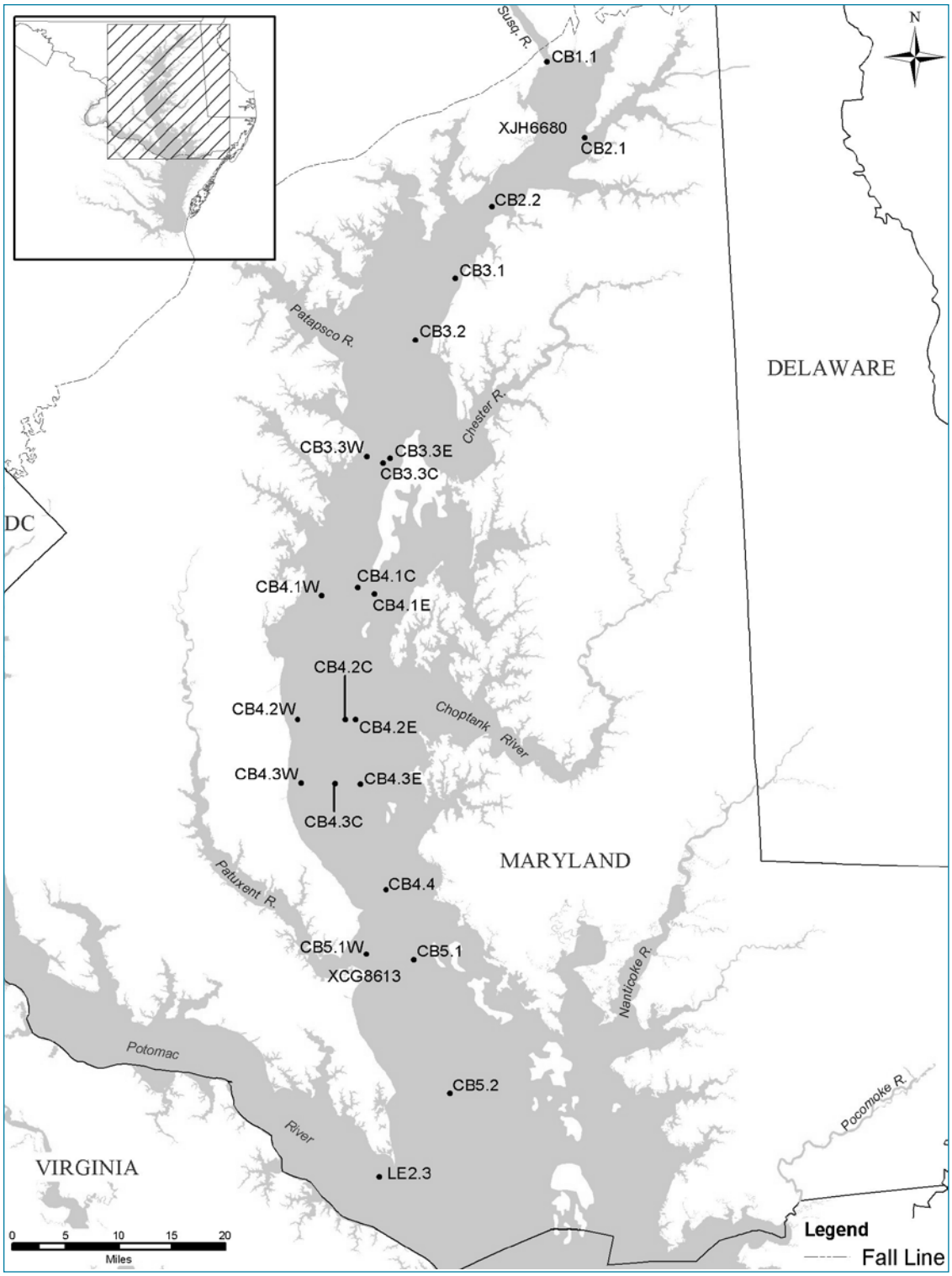

Figure A-1. Maryland Chesapeake Bay mainstem water quality stations.

Source: Chesapeake Bay Program.

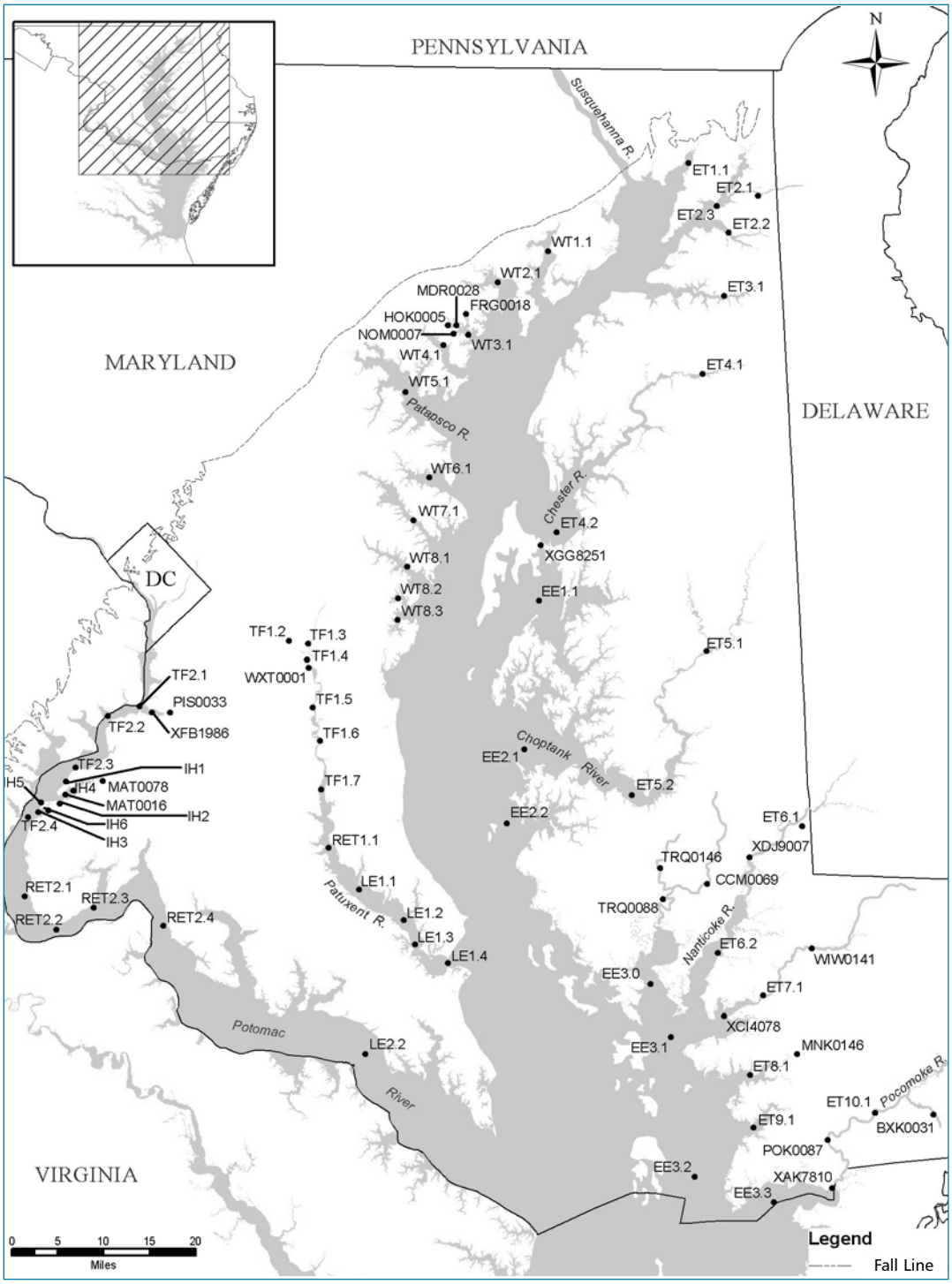

Figure A-2. Maryland tidal tributary water quality monitoring stations.

Source: Chesapeake Bay Program.

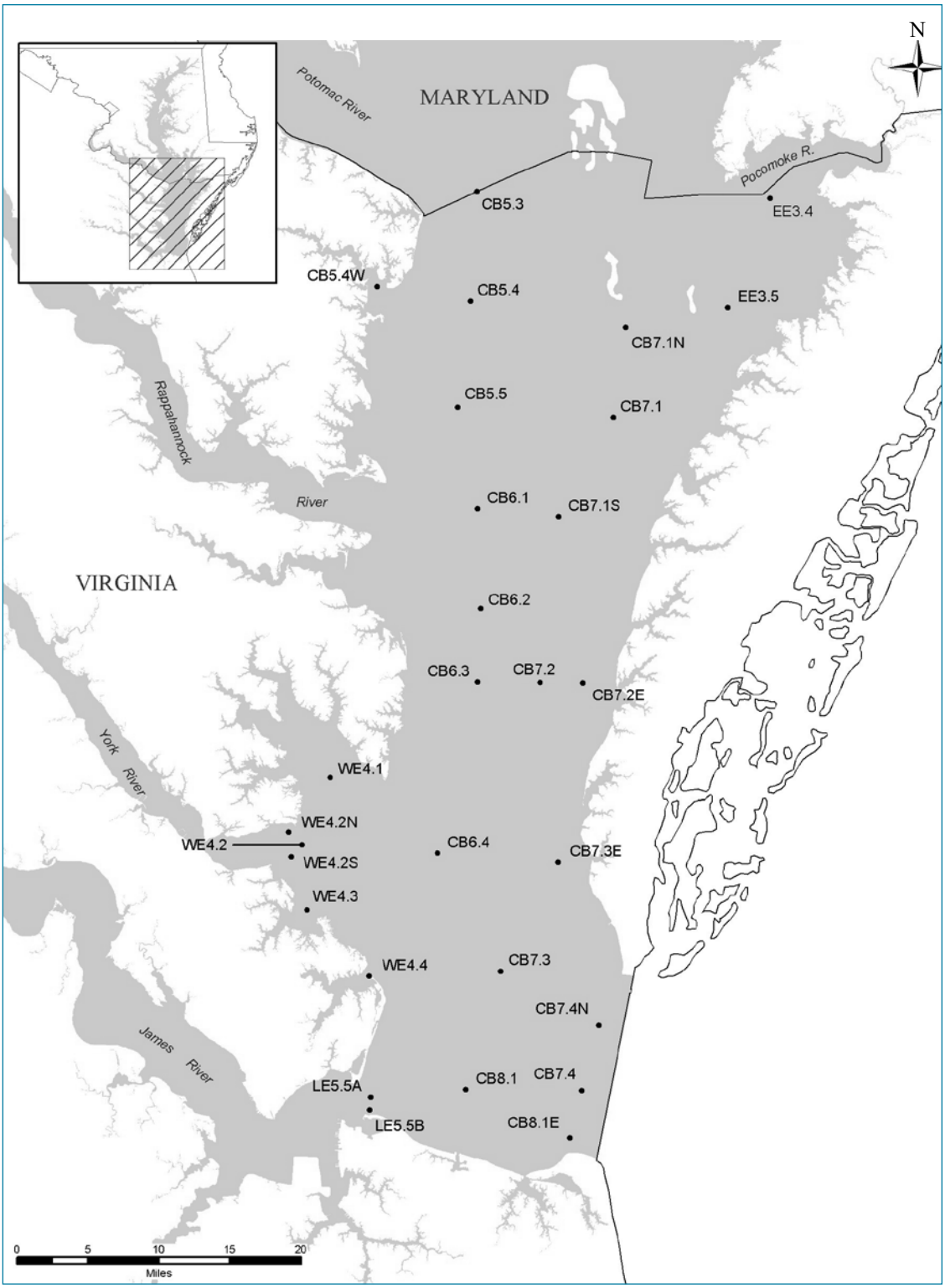

Figure A-3. Virginia Chesapeake Bay mainstem water quality monitoring stations.

Source: Chesapeake Bay Program.

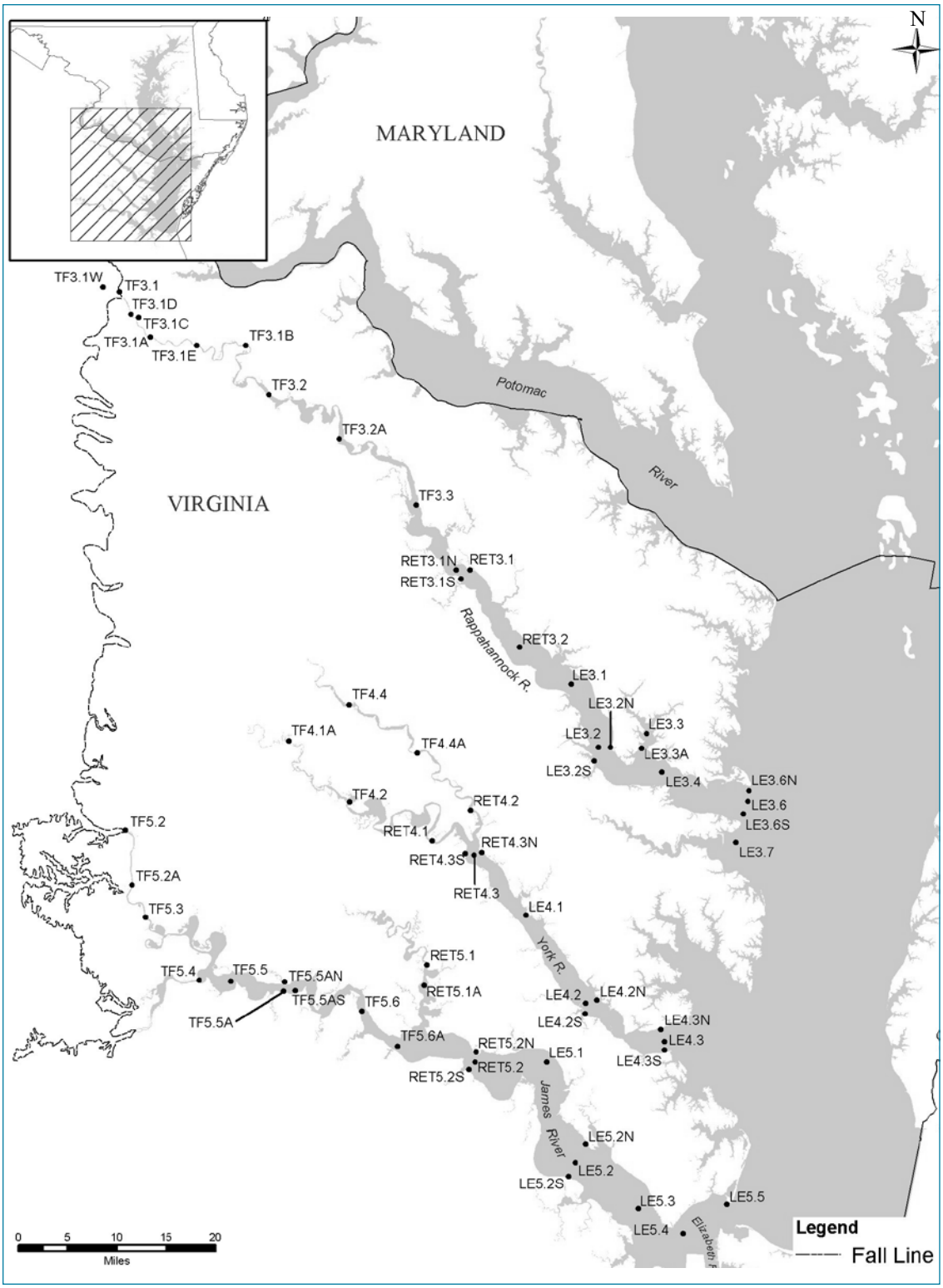

Figure A-4. Virginia tidal tributary water quality monitoring stations.

Source: Chesapeake Bay Program.

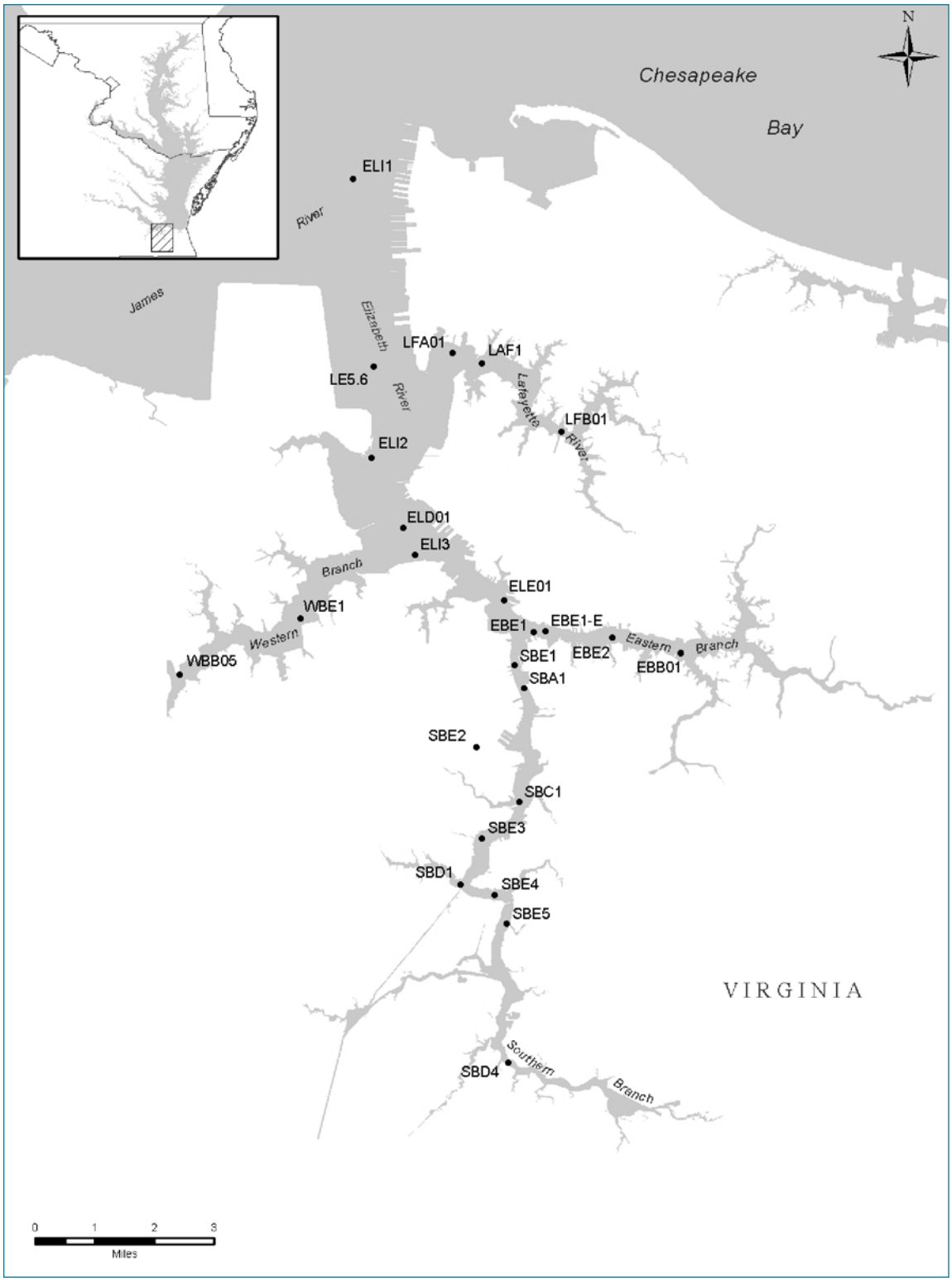

Figure A-5. Elizabeth River tidal water quality monitoring stations.

Source: Chesapeake Bay Program.

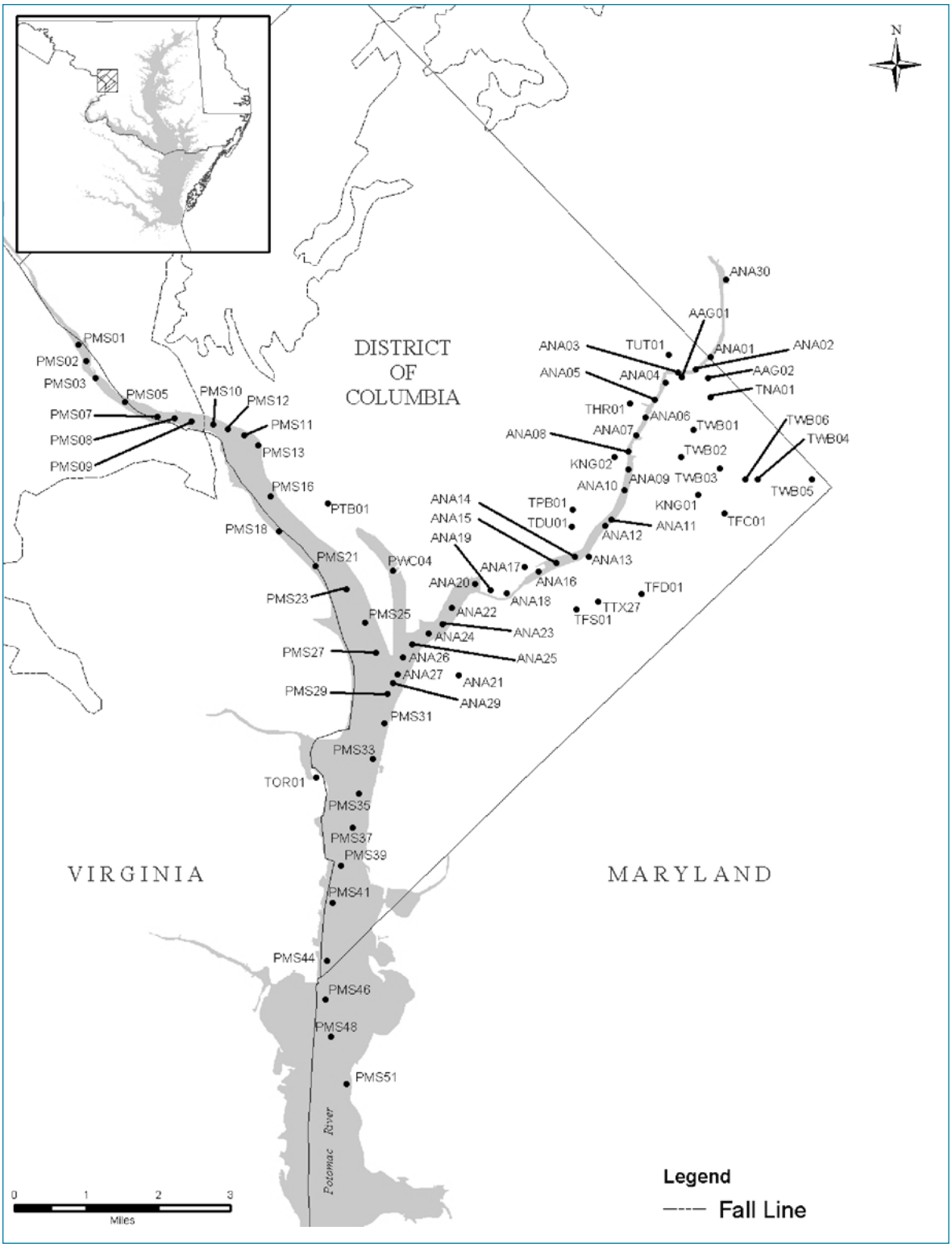

Figure A-6. Upper Potomac and Anacostia River water quality monitoring stations.

Source: Chesapeake Bay Program.

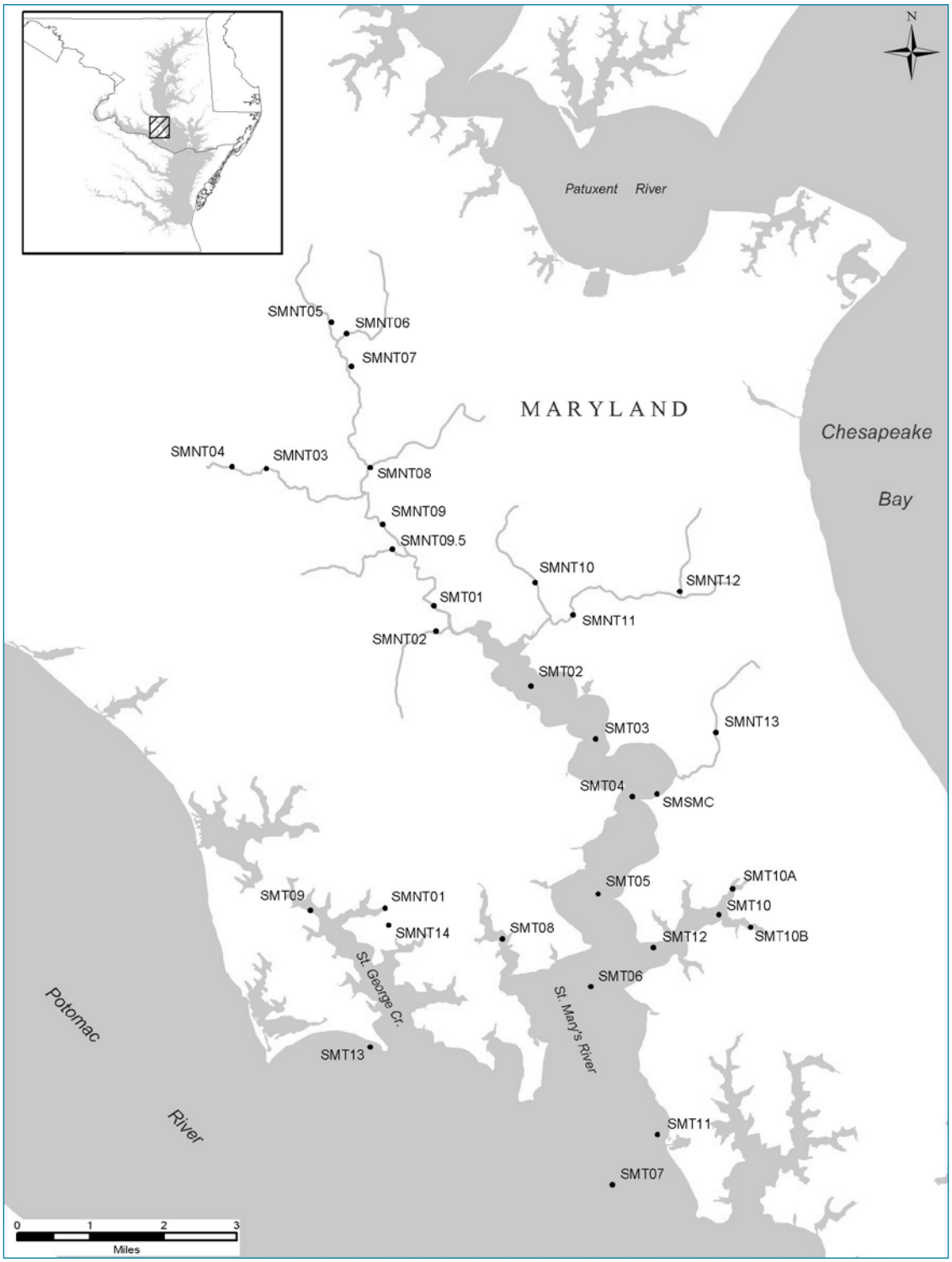

Figure A-7. St. Mary's River water quality monitoring stations.

Source: Chesapeake Bay Program.

appendix b

Maryland's and Virginia's Chesapeake Bay Program Split Segments Boundary Delineations

Table B-1. Latitude/longitude and narrative geo-reference identifiers for the end coordinates bounding each of Maryland's and Virginia's split Chesapeake Bay Program segments.

Segment Description		Chesapeake Bay Program Segment	Split Segment	Number of Latitude/ Longitude Coordinates to Follow
MARYLAND SPLIT SEGMENTS				
Northern Chesapeake		**CB1TF**	**CB1TF1**	8
39.420143	-76.123344	1000 feet southwest of Cherry Tree Point, Aberdeen Proving Ground		
39.401688	-76.035194	North of Chesapeake Haven, Grove Neck		
39.429420	-75.997681	1300 feet southwest of Wroth Point		
39.449200	-76.007698	Turkey Point		
39.449471	-76.010475	Turkey Point, 0.1 miles west southwest of lighthouse		
39.475323	-76.072807	Locust Point on Spesutie Island		
39.476006	-76.094421	East side of Spesutie Narrows bridge		
39.475132	-76.097580	West side of Spesutie Narrows bridge		
			CB1TF2	10
39.475132	-76.097580	West side of Spesutie Narrows bridge		
39.476006	-76.094421	East side of Spesutie Narrows bridge		
39.475323	-76.072807	Locust Point on Spesutie Island		
39.449471	-76.010475	Turkey Point, 0.1 miles west southwest of lighthouse		
39.529629	-75.979271	Red Point		
39.540794	-76.002899	East side of Carpenter Point		
39.608994	-76.121094	Port Deposit		
39.608959	-76.132683	East side Spencer Island		
39.609001	-76.135147	West side Spencer Island		
39.608971	-76.143379	Just south of Rock Run on western shore		
Gunpowder River		**GUNOH**	**GUNOH1**	8
39.316414	-76.331039	Carroll Island, midway between White Oak and Carroll Points		
39.312862	-76.321449	Carroll Point		
39.312767	-76.321190	Carroll Point		
39.303204	-76.296249	Rickett Point at end of Ricketts Point Road		
39.356564	-76.322929	Maxwell Point		
39.358330	-76.345024	Cunninghill Cove, mouth of unnamed creek		
39.326569	-76.361801	170 feet south of west side of bridge to Carroll Island		

continued

Segment Description		Chesapeake Bay Program Segment	Split Segment	Number of Latitude/ Longitude Coordinates to Follow
39.326477	-76.361130	170 feet south of east side of bridge to Carroll Island		
			GUNOH2	3
39.358330	-76.345024	Cunninghill Cove, mouth of unnamed creek		
39.356564	-76.322929	Maxwell Point		
39.412685	-76.400780	Gunpowder Falls, 1500 feet below Route 7		
Lower Patuxent River		**PAXMH**	**PAXMH1**	12
38.304638	-76.421448	Fishing Point		
38.319176	-76.420990	Drum Point		
38.322941	-76.451630	Point of land south of Ship Point and east of Ma Leg Island		
38.321041	-76.451965	Eastern tip of Solomons Island		
38.386593	-76.498840	Mouth of St. Leonard Creek, east side		
38.389153	-76.506416	Petersons Point		
38.412220	-76.542747	Island Creek mouth, east side		
38.411896	-76.544487	Island Creek mouth, Broomes Island side		
38.481140	-76.647560	0.64 miles south of Sandy Point near Buzzard Island		
38.475594	-76.662788	Trent Hall Point		
38.342590	-76.500587	Mouth of Cuckold Creek, north side		
38.339634	-76.499550	Mouth of Cuckold Creek, south side		
			PAXMH2	4
38.475594	-76.662788	Trent Hall Point		
38.481140	-76.647560	0.64 miles south of Sandy Point near Buzzard Island		
38.540684	-76.668045	Gods Grace Point near end of Leitchs Wharf Road		
38.542320	-76.678818	Chalk Point, eastern side		
			PAXMH3	2
38.321041	-76.451965	Eastern tip of Solomons		
38.322941	-76.451630	Point of land south of Ship Point and east of Ma Leg Island		
			PAXMH4	2
38.339634	-76.499550	Mouth of Cuckold Creek, south side		
38.342590	-76.500587	Mouth of Cuckold Creek, north side		
			PAXMH5	3
38.389153	-76.506416	Petersons Point		
38.386593	-76.498840	Mouth of St. Leonard Creek, east side		
38.446831	-76.492088	0.25 miles downstream of Parran Road		
			PAXMH6	3
38.411896	-76.544487	Island Creek mouth, Broomes Island Side		
38.412220	-76.542747	Island Creek mouth, east side		
38.433407	-76.540894	0.7 miles north of point where Marshall Road ends		
Middle Potomac River		**POTOH**	**POTOH1**	8
38.389660	-77.029305	1 miles southeast of Mathias Point, just north of Route 639		
38.407509	-76.997322	0.65 miles northwest of the town of Popes Creek		
38.444935	-77.016396	1.5 miles southeast of Chapel Point, due east of Windmill Point		
38.444565	-77.040695	Windmill Point		
38.408894	-77.110886	Blossom Point		
38.408745	-77.124855	0.15 miles southwest of Benny Gray Point		
38.523266	-77.256630	1000 feet southwest of Moss Point		
38.524181	-77.285294	Midway between Shipping Point and Quantico Pier		
			POTOH2	3
38.444565	-77.040695	Windmill Point		
38.444935	-77.016396	1.5 miles southeast of Chapel Point, due east of Windmill Point		
38.500164	-77.026306	Port Tobacco Marina (edge of 7.5' quad sheet)		
			POTOH3	3
38.408745	-77.124855	0.15 miles southwest of Benny Gray Point		
38.408894	-77.110886	Blossom Point		
38.475391	-77.130676	Wards Run, 0.25 miles upstream of Hill Top Fork		
Elk River		**ELKOH**	**ELKOH1**	8
39.449200	-76.007698	Turkey Point		

continued

Segment Description		Chesapeake Bay Program Segment	Split Segment	Number of Latitude/ Longitude Coordinates to Follow
39.429420	-75.997681	1300 feet southwest of Wroth Point		
39.474773	-75.940498	East of Ford Landing on Veazey Neck		
39.486473	-75.923767	Town Point		
39.523182	-75.871521	West of where the road north from Randalia ends		
39.525536	-75.874619	East side of Welch Point		
39.544392	-75.855301	Paddy Biddle Cove		
39.545540	-75.876144	0.6 miles south of Elkmore		
			ELKOH2	3
39.545540	-75.876144	0.6 miles south of Elkmore		
39.544392	-75.855301	Paddy Biddle Cove		
39.607624	-75.822853	Elkton, 500 feet below Route 7		
Sassafras River		**SASOH**	**SASOH1**	4
39.389511	-76.040848	Grove Point		
39.372025	-76.101227	2850 feet east of Howells Point		
39.371868	-75.955750	0.66 miles northwest of Freeman Creek		
39.378330	-75.961472	Cassidy Wharf		
			SASOH2	3
39.378330	-75.961472	Cassidy Wharf		
39.371868	-75.955750	0.66 miles northwest of Freeman Creek		
39.376785	-75.806549	350 feet upstream of Route 301		
Tangier Sound		**TANMH**	**TANMH1**	26
37.792580	-76.032707	3.25 miles west, 0.3 miles north of Tangier Sound Light		
37.781960	-75.873726	1 miles southeast of south tip of Watts Island, just east of quad boundary		
37.846237	-75.786530	0.57 miles west southwest of flashing red light at tip of Guilford Flats		
37.924927	-75.848007	Eastward Point, on eastern side of Broad Creek		
38.015781	-75.845947	East side of Daugherty Creek Canal		
38.016033	-75.846458	West side of Daugherty Creek Canal		
38.020733	-75.856712	South side of gut southwest of Acre Creek		
38.020973	-75.856819	North side of gut southwest of Acre Creek		
38.036049	-75.868935	700 feet east of Flatcap Point, Janes Island		
38.058910	-75.868744	South shore of Pat Island		
38.064907	-75.866974	Northeast Pat Island, across gut from Hazard Island		
38.065315	-75.866608	Hazard Island, across gut from Pat Island		
38.075314	-75.870750	Gut between Hazard Cove and Mine Creek, south side		
38.075665	-75.871155	Gut between Hazard Cove and Mine Creek, north side		
38.078552	-75.877586	Hazard Island, 1200 feet northeast of tip of Hazard Point		
38.122917	-75.937126	Eastern side of Little Deal Island		
38.125946	-75.941216	Eastern Point on north side of Little Deal Island		
-38.131565	-75.948860	Wenona on Deal Island, north of channel		
38.136566	-75.959633	Twiggs Point		
38.232738	-75.972618	Southern-most point of Clay Island		
38.216042	-76.032051	Bishops Head Point		
38.215809	-76.032349	Bishops Head Point		
38.231964	-76.134285	Lower Hooper Island between Nancys and Creek Points		
38.231445	-76.135773	Lower Hooper Island between Nancys and Creek Points		
38.051910	-76.128838	7000 feet north and 2500 feet west of Fog Point, Smith Island		
37.797581	-76.025650	3 miles west northwest of Tangier Sound Light		
			TANMH2	8
38.232738	-75.972618	Southern-most point of Clay Island		
38.136566	-75.959633	Twiggs Point		
38.160080	-75.932388	Upper Thorofare, Deal Island side		
38.160442	-75.929558	Upper Thorofare at the mouth of Moores Gut		
38.202679	-75.890579	1100 feet west of the tip of Long Point		
38.227970	-75.893486	Nanticoke Point (Stump Point Marsh)		
38.243217	-75.906105	West of Waterview, north of Jones Creek		
38.244740	-75.941284	Sandy Island, northeast of Frog Point		

continued

Segment Description		Chesapeake Bay Program Segment	Split Segment	Number of Latitude/ Longitude Coordinates to Follow
Manokin River		**MANMH**	**MANMH1**	14
38.131565	-75.948860	Wenona on Deal Island, north of channel		
38.125946	-75.941216	Eastern point on north side of Little Deal Island		
38.122917	-75.937126	Eastern side of Little Deal Island		
38.078552	-75.877586	Hazard Island, 1200 feet northeast of tip of Hazard Point		
38.075665	-75.871155	Gut between Hazard Cove and Mine Creek, north side		
38.075314	-75.870750	Gut between Hazard Cove and Mine Creek, south side		
38.069160	-75.855591	West part Hazard Island at Shirtpond Cove		
38.069599	-75.853897	East part Hazard Island at Shirtpond Cove		
38.073784	-75.848656	West side of gut heading north from Flatland Cove		
38.074146	-75.848228	East side of gut heading north from Flatland Cove		
38.133823	-75.827339	Cormal Point		
38.142979	-75.821144	Champ Point		
38.160442	-75.929558	Upper Thorofare at the mouth of Moores Gut		
38.160080	-75.932388	Upper Thorofare, Deal Island side		
			MANMH2	3
38.142979	-75.821144	Champ Point		
38.133823	-75.827339	Cormal Point		
38.172668	-75.732979	Manokin River confluence with Hall Branch		
Big Annamessex River		**BIGMH**	**BIGMH1**	14
38.058910	-75.868744	South shore of Pat Island		
38.036049	-75.868935	700 feet east of Flatcap Point, Janes Island		
38.020973	-75.856819	North side of gut southwest of Acre Creek		
38.020733	-75.856712	South side of gut southwest of Acre Creek		
38.016033	-75.846458	West side of Daugherty Creek Canal		
38.015781	-75.845947	East side of Daugherty Creek Canal		
38.078850	-75.782249	Persimmon Point		
38.074585	-75.787170	Charles Point		
38.074146	-75.848228	East side of gut heading north from Flatland Cove		
38.073784	-75.848656	West side of gut heading north from Flatland Cove		
38.069599	-75.853897	East part Hazard Island at Shirtpond Cove		
38.069160	-75.855591	West part Hazard Island at Shirtpond Cove		
38.065315	-75.866608	Hazard Island, across gut from Pat Island		
38.064907	-75.866974	Northeast Pat Island, across gut from Hazard Island		
			BIGMH2	3
38.074585	-75.787170	Charles Point		
38.078850	-75.782249	Persimmon Point		
38.087246	-75.733032	1000 feet below confluence with Annemesex Creek		

VIRGINIA SPLIT SEGMENTS

Upper James River		**JMSTF**	**JMSTF1**	6
37.227379	-76.946426	0.3 miles downstream of Sloop Point		
37.241180	-76.945686	Tettington, 500 feet downstream of road to the river		
37.332580	-77.267880	Most western point of Eppes Island		
37.334998	-77.274640	South of Bermuda Hundred, west of substation		
37.329826	-77.281128	Mouth of small creek east of Shand Creek and north of light		
37.317638	-77.277275	City Point, Hopewell		
			JMSTF2	3
37.334998	-77.274640	South of Bermuda Hundred, west of substation		
37.332580	-77.267880	Most western point of Eppes Island		
37.533394	-77.436775	Upstream of Mayos Bridge, as far as Browns Island dam		

appendix C

2003 Chesapeake Bay Program Segmentation Scheme Coordinates Geo-reference and Narrative Descriptions

Table C-1. Textual description of coordinates bounding the 2003 Chesapeake Bay Program Segmentation Scheme segments.

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Northern Chesapeake Bay		**CB1TF**	10
39.420143	76.123344	1000 feet southwest of Cherry Tree Point, Aberdeen Proving Ground	
39.401688	76.035194	North of Chesapeake Haven, Grove Neck	
39.429420	75.997681	1300 feet southwest of Wroth Point	
39.4492	76.007698	Turkey Point	
39.529629	75.979271	Red Point	
39.540794	76.002899	East side of Carpenter Point	
39.608994	76.121094	Port Deposit	
39.608959	76.132683	East side Spencer Island	
39.609001	76.135147	West side Spencer Island	
39.608971	76.143379	Just south of Rock Run on western shore	
Bush River		**BSHOH**	3
39.339172	76.256592	800 feet upriver of Leges Point	
39.351715	76.232986	Mouth of Abbey Creek	
39.482510	76.215805	Church Creek, at the railroad tracks	
Gunpowder River		**GUNOH**	7
39.316414	76.331039	Carroll Island, midway between White Oak and Carroll Points	
39.312862	76.321449	Carroll Point	
39.312767	76.321190	Carroll Point	
39.303204	76.296249	Rickett Point at end of Ricketts Point Road	
39.412685	76.400780	Gunpowder Falls, 1500 feet below Route 7	
39.326569	76.361801	170 feet south of west side of bridge to Carroll Island	
39.326477	76.361130	170 feet south of east side of bridge to Carroll Island	
Middle River		**MIDOH**	5
39.286442	76.384102	North shore of Holly Beach	
39.309422	76.342964	Carroll Island, between Weir Point and Hawthorn Cove	
39.326477	76.361130	170 feet south of east side of bridge to Carroll Island	
39.326569	76.361801	170 feet south of west side of bridge to Carroll Island	
39.329792	76.446922	150 feet downstream of railroad tracks, above Eastern Blvd	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Upper Chesapeake Bay		**CB2OH**	16
39.225143	76.408775	North Point State Park, Black Marsh, 1200 feet northeast of small creek	
39.207447	76.246994	3000 feet south of Route 21 (Tolchester Beach Road)	
39.372025	76.101227	2850 feet east of Howells Point	
39.389511	76.040848	Grove Point	
39.401688	76.035194	North of Chesapeake Haven, Grove Neck	
39.420143	76.123344	1000 feet southwest of Cherry Tree Point, Aberdeen Proving Ground	
39.351715	76.232986	Mouth of Abbey Creek	
39.339172	76.256592	800 feet upriver of Leges Point	
39.303204	76.296249	Rickett Point at end of Ricketts Point Road	
39.312767	76.321190	Carroll Point	
39.312862	76.321449	Carroll Point	
39.316414	76.331039	Carroll Island, midway between White Oak and Carroll Points	
39.309422	76.342964	Carroll Island, between Weir Point and Hawthorn Cove	
39.286442	76.384102	North shore of Holly Beach	
39.248951	76.410530	Rocky Point Park, between Claybank and Cedar Points	
39.231178	76.408920	Swan Point, in line with 11th Street	
Back River		**BACOH**	3
39.231178	76.408920	Swan Point, in line with 11th Street	
39.248951	76.410530	Rocky Point Park, between Claybank and Cedar Points	
39.307873	76.520416	Moores Run, 1.25 miles above I 695	
Patapsco River		**PATMH**	3
39.131855	76.435081	Bodkin Neck between Cedar and Bodkin Points	
39.195377	76.444511	North Point south of Fort Howard	
39.275375	76.654480	Gwynns Falls, upstream end of Carroll Park	
Magothy River		**MAGMH**	3
39.039185	76.414330	Between Beacon Hill and Tydings on the Bay	
39.074715	76.422539	East side Gibson Island across from Hapenny Way	
39.114807	76.548195	End of estuary below Catherine Avenue.	
Upper Central Chesapeake		**CB3MH**	10
38.995991	76.413185	500 feet southeast of Moss Pond	
38.989105	76.330185	0.6 miles northeast of where Route 50 west meets the Bay	
39.016422	76.296959	Kent Island, 1600 feet north of Grollman Road	
39.029720	76.242516	Wickes Beach, Eastern Neck Island	
39.056882	-76.220903	South end of Eastern Neck Island, 0.13 miles east of Route 445 bridge	
39.054563	-76.220229	North tip of Eastern Neck Island, 0.13 miles east of Route 445 bridge	
39.207447	76.246994	3000 feet south of Route 21 (Tolchester Beach Road)	
39.225143	76.408775	North Point State Park, Black Marsh, 1200 feet northeast of small creek	
39.195377	76.444511	North Point south of Fort Howard	
39.131855	76.435081	Bodkin Neck between Cedar and Bodkin Points	
39.074715	76.422539	East side Gibson Island across from Hapenny Way	
39.039185	76.414330	Between Beacon Hill and Tydings on the Bay	
Severn River		**SEVMH**	3
38.946095	76.455879	Bay Ridge, near Bainbridge Avenue	
38.976032	76.452377	Greenbury Point, 800 feet up east side from the tip	
39.079697	76.623398	Severn Run, 1100 feet downstream of Veterans Hwy	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
South River		**SOUMH**	4
38.888672	76.489876	Saunders Point, south of Mayo Beach Park	
38.886829	76.475616	0.8 miles east of Saunders Point	
38.907860	76.466240	Southern shore of Thomas Point Park	
38.983105	76.606232	700 feet upstream of Route 50	
Rhode River		**RHDMH**	5
38.867775	76.519608	Salt Pond at the mouth of the Rhode River	
38.864788	76.485870	1.2 miles east southeast of Dutchman Point	
38.886829	76.475616	0.8 miles east of Saunders Point	
38.888672	76.489876	Saunders Point, south of Mayo Beach Park	
38.883629	76.554649	Muddy Creek, 1200 feet below North and South Forks converge	
West River		**WSTMH**	4
38.848892	76.493805	Felicity Cove, 250 feet north of Bay Road	
38.864788	76.485870	1.2 miles east southeast of Dutchman Point	
38.867775	76.519608	Salt Pond at the mouth of the Rhode River	
38.822258	76.551514	2400 feet downstream of Shady Side	
Middle Central Chesapeake		**CB4MH**	18
38.384819	76.381432	Cove Point	
38.393951	76.282532	Meekins Neck, 800 feet north of Cattail Island	
38.421051	76.288589	Meekins Neck, across channel from Point #4	
38.421944	76.288742	Southern tip of Taylors Island	
38.487057	76.331779	West side of Oyster Cove, Taylors Island	
38.526997	76.333771	190 feet south of LCHMH Point #3	
38.527523	76.333801	East edge of tidal flat north of existing James Island	
38.672421	76.340698	720 feet along shore north northwest of Blackwalnut Point	
38.719185	76.334084	South side Knapps Narrows, 275 feet west of Route 33	
38.719967	76.333054	North side Knapps Narrows, 150 feet west of Route 33	
38.752529	76.340332	1500 feet northeast of Green Marsh Point	
38.836365	76.369392	Kent Point	
38.989105	76.330185	0.6 miles northeast of where Route 50 west meets the Bay	
38.995991	76.413185	500 feet southeast of Moss Pond	
38.976032	76.452377	Greenbury Point, 800 feet up east side from the tip	
38.946095	76.455879	Bay Ridge, near Bainbridge Avenue	
38.907860	76.466240	Southern shore of Thomas Point Park	
38.848892	76.493805	Felicity Cove, 250 feet north of Bay Road	
Western Branch Patuxent		**WBRTF**	3
38.784637	76.713326	Mouth of Western Branch, west side	
38.785023	76.712456	Mouth of Western Branch, east side	
38.797241	76.729507	Where Western Branch narrows, north of sewage plant	
Upper Patuxent River		**PAXTF**	5
38.700325	76.695824	On marshy point 0.5 miles north of Hotschkins Branch	
38.700516	76.694160	0.8 miles north of Jones Point	
38.874958	76.677834	Near unnamed stream south of Mt. Nebo Branch	
38.785023	76.712456	Mouth of Western Branch, east side	
38.784637	76.713326	Mouth of Western Branch, west side	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Middle Patuxent River		**PAXOH**	4
38.542320	76.678818	Chalk Point, eastern side	
38.540684	76.668045	Gods Grace Point near end of Leitchs Wharf Road	
38.700516	76.694160	0.8 miles north of Jones Point	
38.700325	76.695824	On marshy point 0.5 miles north of Hotschkins Branch	
Lower Patuxent River		**PAXMH**	4
38.304638	76.421448	Fishing Point	
38.319176	76.420990	Drum Point	
38.540684	76.668045	Gods Grace Point near end of Leitchs Wharf Road	
38.542320	76.678818	Chalk Point, eastern side	
Lower Central Chesapeake		**CB5MH**	16
37.619465	76.280251	Fleets Island, at end of road north of Windmill Point	
37.797581	76.025650	3 miles west northwest of Tangier Sound Light	
38.051910	76.128838	7000 feet north and 2500 feet west of Fog Point, Smith Island	
38.231445	76.135773	Lower Hooper Island between Nancys and Creek Points	
38.248581	76.153191	Lower Hooper Island, northeast end of The Thorofare	
38.248642	76.154419	Middle Hooper Island, northwest end of The Thorofare	
38.295982	76.204597	Northwest tip of Middle Hooper Island across from Ferry Point	
38.298965	76.206718	Ferry Point	
38.348228	76.227264	Drawbridge, northern Upper Hooper Island	
38.349953	76.227982	Drawbridge, southern Meekins Neck	
38.393951	76.282532	Meekins Neck, 800 feet north of Cattail Island	
38.384819	76.381432	Cove Point	
38.319176	76.420990	Drum Point	
38.304638	76.421448	Fishing Point	
38.038605	76.321442	Point Lookout	
37.909725	76.263702	East of Ophelia, 300 feet northwest of light	
Upper Potomac River		**POTTF**	9
38.524181	77.285294	Midway between Shipping Point and the Quantico Pier	
38.523266	77.256630	1000 feet southwest of Moss Point	
38.554722	77.220268	Stump Neck, east of radio towers and west of Roach Road	
38.566856	77.209755	Cornwallis Neck, 0.25 miles northwest of Deep Point	
38.702038	77.044693	Mockley Point, 500 feet west of tip	
38.711002	77.036736	West of Ft. Washington	
38.850609	77.018761	Border between Bolling Air Force Base and U.S. Naval Station	
38.856720	77.022491	Hains Point	
38.979492	77.227455	1800 feet upstream of Offutt Island	
Anacostia River		**ANATF**	3
38.856720	77.022491	Hains Point	
38.850609	77.018761	Border between Bolling Air Force Base and U.S. Naval Station	
38.938805	76.942162	100 feet below Bladensburg Road bridge	
Piscataway River		**PISTF**	3
38.711002	77.036736	West of Ft. Washington	
38.702038	77.044693	Mockley Point, 500 feet west of tip	
38.697979	76.996788	Piscataway Creek Park, north of sewage disposal plant	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Mattawoman Creek		**MATTF**	3
38.566856	77.209755	Cornwallis Neck, 0.25 miles northwest of Deep Point	
38.554722	77.220268	Stump Neck, east of radio towers and west of Roach Road	
38.591194	77.124672	2300 feet downstream of Routes 224/225 (7.5' quad edge)	
Middle Potomac River		**POTOH**	4
38.389660	77.029305	1 mile southeast of Mathias Point, just north of Route 639	
38.407509	76.997322	0.65 miles northwest of the town of Popes Creek	
38.523266	77.256630	1000 feet southwest of Moss Point	
38.524181	77.285294	Midway between Shipping Point and Quantico Pier	
Lower Potomac River		**POTMH**	4
37.909725	76.263702	East of Ophelia, 300 feet northwest of light	
38.038605	76.321442	Point Lookout	
38.407509	76.997322	0.65 miles northwest of the town of Popes Creek	
38.389660	77.029305	1 mile southeast of Mathias Point, just north of Route 639	
Northeast River		**NORTF**	3
39.540794	76.002899	East side of Carpenter Point	
39.529629	75.979271	Red Point	
39.608879	75.937988	750 feet above railroad bridge, 1500 feet below Route 40	
Elk River		ELKOH	7
39.449200	76.007698	Turkey Point	
39.429420	75.997681	1300 feet southwest of Wroth Point	
39.474773	75.940498	East of Ford Landing on Veazey Neck	
39.486473	75.923767	Town Point	
39.523182	75.871521	West of where the road north from Randalia ends	
39.525536	75.874619	East side of Welch Point	
39.607624	75.822853	Elkton, 500 feet below Route 7	
C&D Canal		**C&DOH**	3
39.525536	75.874619	East side of Welch Point	
39.523182	75.871521	West of where the road north from Randalia ends	
39.542904	75.724831	North of Summit Bridge and 250 feet east of the power line	
Bohemia River		**BOHOH**	3
39.486473	75.923767	Town Point	
39.474773	75.940498	East of Ford Landing on Veazey Neck	
39.461319	75.783554	600 feet below where Sandy Branch enters	
Sassafras River		**SASOH**	3
39.389511	76.040848	Grove Point	
39.372025	76.101227	2850 feet east of Howells Point	
39.376785	75.806549	350 feet upstream of Route 301	
Upper Chester River		**CHSTF**	3
39.246002	75.986618	Travilla Wharf	
39.245350	75.985878	Marshy point across from Travilla Wharf	
39.254440	75.839638	Andover Branch 900 feet above Route 313	
Middle Chester River		**CHSOH**	4
39.147564	76.086426	1100 feet below Browns Creek	
39.146572	76.075684	Northwest Point, west of Riverview	
39.245350	75.985878	Marshy point across from Travilla Wharf	
39.246002	75.986618	Travilla Wharf	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Lower Chester River		**CHSMH**	6
39.029720	76.242516	Wickes Beach, Eastern Neck Island	
39.016422	76.296959	Kent Island, 1600 feet north of Grollman Road	
38.970539	76.248413	Route 50, west side of Kent Narrows	
38.970455	76.246330	Route 50, east side of Kent Narrows	
39.146572	76.075684	Northwest Point, west of Riverview	
39.147564	76.086426	1100 feet below Browns Creek	
39.056882	-76.220903	South end of Eastern Neck Island, 0.13 miles east of Route 445 bridge	
39.054563	-76.220229	North tip of Eastern Neck Island, 0.13 miles east of Route 445 bridge	
Eastern Bay		**EASMH**	4
38.836365	76.369392	Kent Point	
38.752529	76.340332	1500 feet northeast of Green Marsh Point	
38.970455	76.246330	Route 50, east side of Kent Narrows	
38.970539	76.248413	Route 50, west side of Kent Narrows	
Upper Choptank River		**CHOTF**	3
38.810635	75.902985	1850 feet downstream from mouth of Tuckahoe Creek	
38.808270	75.900391	1000 feet downstream of Gilpin Point	
38.980827	75.792931	3500 feet upstream of Route 313 bridge	
Middle Choptank River		**CHOOH**	4
38.653545	75.959129	1.5 miles downstream of Bow Knee Point	
38.647415	75.952339	1.05 miles upstream of Cabin Creek	
38.808270	75.900391	1000 feet downstream of Gilpin Point	
38.810635	75.902985	1850 feet downstream from mouth of Tuckahoe Creek	
Lower Choptank River		**CHOMH1**	7
38.672421	76.340698	720 feet along shore north northwest of Blackwalnut Point	
38.571705	76.336029	Hills Point	
38.573353	76.306503	1.6 miles almost due west of Hills Point	
38.628571	76.171051	400 feet west of Castle Haven Point	
38.649193	76.153114	0.9 miles north of Chlora Point	
38.719967	76.333054	North side Knapps Narrows, 150 feet west of Route 33	
38.719185	76.334084	South side Knapps Narrows, 275 feet west of Route 33	
Mouth of Choptank River		**CHOMH2**	4
38.649193	76.153114	0.9 miles north of Chlora Point	
38.628571	76.171051	400 feet west of Castle Haven Point	
38.647415	75.952339	1.05 miles upstream of Cabin Creek	
38.653545	75.959129	1.5 miles downstream of Bow Knee	
Little Choptank River		**LCHMH**	9
38.573353	76.306503	1.6 miles almost due west of Hills Point	
38.571705	76.336029	Hills Point	
38.527523	76.333801	East edge of tidal flat north of existing James Island	
38.526997	76.333771	190 feet south of LCHMH Point #3	
38.487057	76.331779	West side of Oyster Cove, Taylors Island	
38.421944	76.288742	Southern tip of Taylors Island	
38.421051	76.288589	Meekins Neck, across channel from Point #6	
38.398201	76.237053	West shore Great Marsh Creek 1800 feet above Route 335	
38.398605	76.237030	East shore Great Marsh Creek 1800 feet above Route 335	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Honga River		**HNGMH**	10
38.231964	76.134285	Lower Hooper Island between Nancys and Creek Points	
38.215809	76.032349	Bishops Head Point	
38.398605	76.237030	Great Marsh Creek, north side, 1900 feet above Route 335	
38.398201	76.237053	Great Marsh Creek, south side, 1900 feet above Route 335	
38.349953	76.227982	Drawbridge, southern Meekins Neck	
38.348228	76.227264	Drawbridge, northern Upper Hooper Island	
38.298965	76.206718	Ferry Point	
38.295982	76.204597	Northwest tip of Middle Hooper Island across from Ferry Point	
38.248642	76.154419	Middle Hooper Island, northwest end of The Thorofare	
38.248581	76.153191	Lower Hooper Island, northeast end of The Thorofare	
Fishing Bay		**FSBMH**	4
38.216042	76.032051	Bishops Head Point	
38.232738	75.972618	Southern most point of Clay Island	
38.404148	76.002716	Transquaking River west of Thorofare Marsh	
38.404133	76.029968	Backgarden Pond, southeast shore	
Upper Nanticoke River		**NANTF**	3
38.538052	75.745972	600 feet upstream of Molly Horn Branch	
38.536259	75.744843	375 feet upstream of Plum Creek	
38.642723	75.606522	Seaford, Delaware just above Middleford Road	
Middle Nanticoke River		NANOH	5
38.387169	75.859673	900 feet downstream of Wapremander Creek	
38.381268	75.839233	600 feet upstream of Quantico Creek	
38.536259	75.744843	375 feet upstream of Plum Creek	
38.538052	75.745972	600 feet upstream of Molly Horn Branch	
38.553452	75.774071	Marshyhope Creek, 500 feet downstream of Big Indian	
Lower Nanticoke River		**NANMH**	4
38.24474	75.941284	Sandy Island, northeast of Frog Point	
38.243217	75.906105	West of Waterview, north of Jones Creek	
38.381268	75.839233	600 feet upstream of Quantico Creek	
38.387169	75.859673	900 feet downstream of Wapremander Creek	
Wicomico River		**WICMH**	3
38.227970	75.893486	Nanticoke Point (Stump Point Marsh)	
38.202679	75.890579	1100 feet west of the tip of Long Point	
38.361588	75.583061	Beaverdam Creek, 3000 feet upstream of Route 12	
Tangier Sound		**TANMH**	31
37.792580	76.032707	3.25 miles west, 0.3 miles north of Tangier Sound Light	
37.781960	75.873726	1 mile southeast of south tip of Watts Island, just east of quad boundary	
37.846237	75.786530	0.57 miles west southwest of flashing red light at tip of Guilford Flats	
37.924927	75.848007	Eastward Point, on eastern side of Broad Creek	
38.015781	75.845947	East side of Daugherty Creek Canal	
38.016033	75.846458	West side of Daugherty Creek Canal	
38.020733	75.856712	South side of gut southwest of Acre Creek	
38.020973	75.856819	North side of gut southwest of Acre Creek	
38.036049	75.868935	700 feet east of Flatcap Point, Janes Island	
38.058910	75.868744	South shore of Pat Island	
38.064907	75.866974	Northeast Pat Island, across gut from Hazard Island	
38.065315	75.866608	Hazard Island, across gut from Pat Island	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
38.075314	75.870750	Gut between Hazard Cove and Mine Creek, south side	
38.075665	75.871155	Gut between Hazard Cove and Mine Creek, north side	
38.078552	75.877586	Hazard Island, 1200 feet northeast of tip of Hazard Point	
38.122917	75.937126	Eastern side of Little Deal Island	
38.125946	75.941216	Eastern point on north side of Little Deal Island	
38.131565	75.948860	Wenona on Deal Island, north of channel	
38.160080	75.932388	Upper Thorofare, Deal Island side	
38.160442	75.929558	Upper Thorofare at the mouth of Moores Gut	
38.202679	75.890579	1100 feet west of the tip of Long Point	
38.227970	75.893486	Nanticoke Point (Stump Point Marsh)	
38.243217	75.906105	West of Waterview, north of Jones Creek	
38.244740	75.941284	Sandy Island, northeast of Frog Point	
38.232738	75.972618	Southern most point of Clay Island	
38.216042	76.032051	Bishops Head Point	
38.215809	76.032349	Bishops Head Point	
38.231964	76.134285	Lower Hooper Island between Nancys and Creek Points	
38.231445	76.135773	Lower Hooper Island between Nancys and Creek Points	
38.051910	76.128838	7000 feet north and 2500 feet west of Fog Point, Smith Island	
37.797581	76.025650	3 miles west northwest of Tangier Sound Light	
Manokin River		**MANMH**	14
38.131565	75.948860	Wenona on Deal Island, north of channel	
38.125946	75.941216	Eastern point on north side of Little Deal Island	
38.122917	75.937126	Eastern side of Little Deal Island	
38.078552	75.877586	Hazard Island, 1200 feet northeast of tip of Hazard Point	
38.075665	75.871155	Gut between Hazard Cove and Mine Creek, north side	
38.075314	75.870750	Gut between Hazard Cove and Mine Creek, south side	
38.069160	75.855591	West part Hazard Island at Shirtpond Cove	
38.069599	75.853897	East part Hazard Island at Shirtpond Cove	
38.073784	75.848656	West side of gut heading north from Flatland Cove	
38.074146	75.848228	East side of gut heading north from Flatland Cove	
38.172668	75.732979	Manokin River confluence with Hall Branch	
38.160442	75.929558	Upper Thorofare at the mouth of Moores Gut	
38.160080	75.932388	Upper Thorofare, Deal Island side	
Big Annemessex River		**BIGMH**	13
38.058910	75.868744	South shore of Pat Island	
38.036049	75.868935	700 feet east of Flatcap Point, Janes Island	
38.020973	75.856819	North side of gut southwest of Acre Creek	
38.020733	75.856712	South side of gut southwest of Acre Creek	
38.016033	75.846458	West side of Daugherty Creek Canal	
38.015781	75.845947	East side of Daugherty Creek Canal	
38.087246	75.733032	1000 feet below confluence with Annemesex Creek	
38.074146	75.848228	East side of gut heading north from Flatland Cove	
38.073784	75.848656	West side of gut heading north from Flatland Cove	
38.069599	75.853897	East part Hazard Island at Shirtpond Cove	
38.069160	75.855591	West part Hazard Island at Shirtpond Cove	
38.065315	75.866608	Hazard Island, across gut from Pat Island	
38.064907	75.866974	Northeast Pat Island, across gut from Hazard Island	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Upper Pocomoke River		**POCTF**	3
38.062958	75.617470	West of Unionville, Somerset County side	
38.062840	75.616302	West of Unionville, Worcester County side	
38.183201	75.391991	Snow Hill, 1900 feet upstream of Route 12	
Middle Pocomoke River		**POCOH**	4
37.966858	75.674603	On mainland 4000 feet northwest of Fair Island	
37.941841	75.677261	Between Pig Point and Shad Landing	
38.062840	75.616302	West of Unionville, Worcester County side	
38.062958	75.617470	West of Unionville, Somerset County side	
Lower Pocomoke River		**POCMH**	7
37.924927	75.848007	Eastward Point, on eastern side of Broad Creek	
37.806671	75.755676	Scott Island, west side	
37.806152	75.755272	Scott Island, south side	
37.787926	75.741074	South of Webb Island, between Deep Creek and Doe Creek	
37.941841	75.677261	Between Pig Point and Shad Landing	
37.966858	75.674603	On mainland 4000 feet northwest of Fair Island	
Western Lower Chesapeake Bay		**CB6PH**	11
37.084686	76.271126	900 feet southwest of abandoned lighthouse north northeast of Grand View	
37.087894	76.268974	400 feet northeast of abandoned lighthouse north northeast of Grand View	
37.083694	76.165154	6 miles east of Grand View, 10.2 miles west of Fishermans Island	
37.729496	76.123352	10 miles east of Hughlett Point, approximately 1 mile north of wreck	
37.619465	76.280251	Fleets Island, at end of road north of Windmill Point	
37.613708	76.280586	Windmill Point	
37.512447	76.285423	Gwynn Island, east side of northern end	
37.473808	76.263008	Gwynn Island, 0.25 miles northeast of Sandy Point tip	
37.462313	-76.257705	0.08 miles north northeast from northern tip of Rigby Island	
37.459854	76.257225	Rigby Island, east side of northern end	
37.309418	76.275558	North side of Deep Creek, north of New Point Comfort	
37.105408	76.283676	East side of Northend Point	
Eastern Lower Chesapeake Bay		**CB7PH**	11
37.083694	76.165154	6 miles east of Grand View, 10.2 miles west of Fishermans Island	
37.010635	75.965233	5 miles south of Fishermans Island, 6.3 miles northeast of Cape Henry	
37.111908	75.933571	0.68 miles west of Smith Island, 2 miles east of Route 13	
37.115574	75.970390	300 feet due north of light in channel, 260 feet west of Route 13	
37.787926	75.741074	South of Webb Island, between Deep Creek and Doe Creek	
37.806152	75.755272	Scott Island, south side	
37.806671	75.755676	Scott Island, west side	
37.846237	75.786530	0.57 miles southwest of flashing red light at tip of Guilford Flats	
37.781960	75.873726	1 mile southeast of south tip of Watts Island, just east of quad boundary	
37.792580	76.032707	3.25 miles west, 0.3 miles north of Tangier Sound Light	
37.729496	76.123352	10 miles east of Hughlett Point, approximately 1 mile north of wreck	
Mouth of the Chesapeake Bay		**CB8PH**	9
36.967342	76.296967	Where I 64 south meets Willoughby Spit	
36.907486	76.093224	West side of Lesner Bridge (Route 60)	
36.907352	76.090591	East side of Lesner Bridge (Route 60)	
36.919083	75.993782	Fort Story, 2000 feet north of North Virginia Beach	
37.010635	75.965233	5 miles south of Fishermans Island, 6.3 miles northeast of Cape Henry	
37.083694	76.165154	6 miles east of Grand View, 10.2 miles west of Fishermans Island	
37.087894	76.268974	400 feet northeast of abandoned lighthouse north northeast of Grand View	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
37.084686	76.271126	900 feet southwest of abandoned lighthouse north northeast of Grand View	
37.017586	76.297104	Fort Monroe Military Reservation, west of Thimble Shoal	
37.002299	-76.300643	0.32 miles east northeast of Old Point Comfort lighthouse	
Upper Rappahannock River		**RPPTF**	3
38.082386	76.979980	430 feet east of the mouth of Hutchinson Swamp	
38.089813	76.973442	0.7 miles upstream of Peedee Creek	
38.312946	77.462326	Fredericksburg, 300 feet above aqueduct	
Middle Rappahannock River		**RPPOH**	4
37.979389	76.924652	1000 feet downstream (southeast) of Jenkins Landing	
37.988907	76.895859	Mulberry Island, 0.33 miles upstream (northwest) of Mulberry Point	
38.089813	76.973442	0.7 miles upstream of Peedee Creek	
38.082386	76.979980	430 feet east of the mouth of Hutchinson Swamp	
Lower Rappahannock River		**RPPMH**	7
37.558598	76.297974	Stingray Point	
37.558395	76.283516	0.8 miles east of Stingray Point (point 1)	
37.613708	76.280586	Windmill Point	
37.653767	76.457794	0.5 miles northwest of Orchard Point	
37.649799	76.496513	Approximately 0.25 miles south of Whitehouse Creek mouth	
37.988907	76.895859	Mulberry Island, 0.33 miles upstream (northwest) of Mulberry Point	
37.979389	76.924652	1000 feet downstream (southeast) of Jenkins Landing	
Corrotoman River		**CRRMH**	3
37.649799	76.496513	Approximately 0.25 miles south of Whitehouse Creek mouth	
37.653767	76.457794	0.5 miles northwest of Orchard Point	
37.769997	76.478516	Western Branch, 400 feet upstream of Route 3	
Piankatank River		**PIAMH**	6
37.473808	76.263008	Gwynn Island, 0.25 miles northeast of Sandy Point tip	
37.512447	76.285423	Gwynn Island, east side of northern end	
37.558395	76.283516	0.8 miles east of Stingray Point (RPPMH point 1)	
37.558598	76.297974	Stingray Point	
37.577724	76.583008	Dragon Swamp, 0.5 miles below Zion Branch	
37.459854	76.257225	Rigby Island, east side of northern end	
37.462313	-76.257705	0.08 miles north northeast from northern tip of Rigby Island	
Upper Mattaponi River		**MPNTF**	3
37.656723	76.882187	Across the river from Courthouse Landing	
37.658237	76.881470	1000 feet upstream of Mitchell Hill Creek	
37.788898	77.104210	Aylett, 800 feet above Route 360 bridge	
Lower Mattaponi River		**MPNOH**	4
37.538822	76.791504	Lord Delaware Bridge (Route 33), West Point side	
37.537014	76.786194	Lord Delaware Bridge (Route 33), east side	
37.658237	76.881470	1000 feet upstream of Mitchell Hill Creek	
37.656723	76.882187	Across the river from Courthouse Landing	
Upper Pamunkey River		**PMKTF**	3
37.543476	76.976799	0.75 miles upstream of creek at Cook Landing	
37.543507	76.974968	Cohoke Marsh, 0.9 miles downstream of Turkey Creek	
37.689621	77.214119	2000 feet upstream of Totopotomoy Creek	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Lower Pamunkey River		**PMKOH**	4
37.532749	76.810616	Eltham Bridge (Routes. 30/33), west side	
37.535069	76.805229	Eltham Bridge (Routes 30/33), east side (West Point)	
37.543507	76.974968	Cohoke Marsh, 0.9 miles downstream of Turkey Creek	
37.543476	76.976799	0.75 miles upstream of creek at Cook Landing	
Middle York River		**YRKMH**	6
37.288246	76.598122	Naval Supply Center, Cheatham Annex	
37.316483	76.577034	Blundering Point, 1000 feet northwest of tip	
37.537014	76.786194	Lord Delaware Bridge (Route 33), east side	
37.538822	76.791504	Lord Delaware Bridge (Route 33), West Point side	
37.535069	76.805229	Eltham Bridge (Routes 30/33), east side (West Point)	
37.532749	76.810616	Eltham Bridge (Routes 30/33), west side	
Lower York River		**YRKPH**	4
37.223167	76.420166	Sandbox, northeast tip of Goodwin Neck	
37.262413	76.390877	Jenkins Neck, between Hog Island and Sandy Point	
37.316483	76.577034	Blundering Point, 1000 feet northwest of tip	
37.288246	76.598122	Naval Supply Center, Cheatham Annex	
Mobjack Bay		**MOBPH**	4
37.105408	76.283676	East side of Northend Point	
37.309418	76.275558	North side of Deep Creek, north of New Point Comfort	
37.262413	76.390877	Jenkins Neck, between Hog Island and Sandy Point	
37.223167	76.420166	Sandbox, northeast tip of Goodwin Neck	
Upper James River		**JMSTF**	5
37.227379	76.946426	0.3 miles downstream of Sloop Point	
37.241180	76.945686	Tettington, 500 feet downstream of road to the river	
37.533394	77.436775	Upstream of Mayos Bridge, as far as Browns Island dam	
37.329826	77.281128	Mouth of small creek east of Shand Creek and north of light	
37.317638	77.277275	City Point, Hopewell	
Appomattox River		**APPTF**	3
37.317638	77.277275	City Point, Hopewell	
37.329826	77.281128	Mouth of small creek east of Shand Creek and north of light	
37.233662	77.407867	Petersburg, 1500 feet upstream of Route1 bridge	
Middle James River		**JMSOH**	6
37.154785	76.670403	0.7 miles north of Hunnicut Creek, south of Hog Island	
37.202007	76.626305	Near Carters Grove Home, 1.25 miles southeast of Grove Creek	
37.245670	76.871529	1300 feet north northwest of Barrets Point	
37.245888	76.897522	During Point	
37.241180	76.945686	Tettington, 500 feet downstream of road to the river	
37.227379	76.946426	0.3 miles downstream of Sloop Point	
Chickahominy River		**CHKOH**	3
37.245888	76.897522	During Point	
37.245670	76.871529	1300 feet north northwest of Barrets Point	
37.429108	77.028267	Above Holly Landing, 150 feet below temporary divergence	

continued

Segment Description		Chesapeake Bay Program Segment	Number of Latitude/ Longitude Coordinates to Follow
Lower James River		**JMSMH**	4
36.923653	76.385788	Northwest corner of Craney Island Disposal Area	
36.964985	76.410645	Newport News Point, just south of Lincoln Park	
37.202007	76.626305	Near Carters Grove Home, 1.25 miles southeast of Grove Creek	
37.154785	76.670403	0.7 miles north of Hunnicut Creek, south of Hog Island	
Mouth of James River		**JMSPH**	6
36.967342	76.296967	Where I 64 S meets Willoughby Spit	
37.002299	-76.300643	0.32 miles east northeast of Old Point Comfort lighthouse	
37.017586	76.297104	Fort Monroe Military Reservation, west of Thimble Shoal	
36.964985	76.410645	Newport News Point, just south of Lincoln Park	
36.923653	76.385788	Northwest corner of Craney Island Disposal Area	
36.923153	76.354614	Northeast corner of Craney Island Disposal Area	
36.925476	76.329292	Northwest side of pond 1950 feet south of Sewells Point Docks	
Western Branch Elizabeth River		**WBEMH**	3
36.856030	76.331711	Pinner Point, northwest corner at railroad tracks	
36.860474	76.341103	Lovett Point, southeast corner	
36.818913	76.399612	1800 feet south of Hodges Ferry Bridge (Route 337)	
Southern Branch Elizabeth River		**SBEMH**	3
36.839340	76.290077	930 feet west of the south end of Berkley Bridge	
36.839539	76.295753	250 feet south of light and 2500 feet north of Downtown Tunnel	
36.723557	76.248955	Great Bridge Lock	
Eastern Branch Elizabeth River		**EBEMH**	3
36.843090	76.289368	The Waterside	
36.839779	76.289261	700 feet west of the south end of Berkley Bridge	
36.827354	76.167595	300 feet downstream of Route 165	
Lafayette River		**LAFMH**	3
36.903587	76.323219	Tanners Point	
36.901581	76.314362	1400 feet due east of light southeast of Tanners Point	
36.865322	76.257843	Calvary Cemetery, 3400 feet upstream of Route 168	
Mouth to mid-Elizabeth River		**ELIPH**	10
36.925476	76.329292	Northwest side of pond 1950 feet south of Sewells Point Docks	
36.923153	76.354614	Northeast corner of Craney Island Disposal Area	
36.860474	76.341103	Lovett Point, southeast corner	
36.856030	76.331711	Pinner Point, northwest corner at railroad tracks	
36.839539	76.295753	250 feet south of light and 2500 feet north of Downtown Tunnel	
36.839340	76.290077	930 feet west of the south end of Berkley Bridge	
36.839779	76.289261	700 feet west of the south end of Berkley Bridge	
36.843090	76.289368	The Waterside	
36.901581	76.314362	1400 feet due east of light southeast of Tanners Point	
36.903587	76.323219	Tanners Point	
Lynnhaven River		**LYNPH**	2
36.907352	76.090591	East side of Lesner Bridge (Route 60)	
36.907486	76.093224	West side of Lesner Bridge (Route 60)	