chapter i

Introduction

Nutrients are essential to the health and diversity of our surface waters. However, excessive nutrients lead to low dissolved oxygen, fish kills, algal blooms and imbalances in the aquatic food web. They also pose potential risks to human health, such as those recently manifested in the harmful algal blooms of the Gulf and East coasts, including the tidal tributaries of the Chesapeake Bay.

National water quality inventories have repeatedly shown that nutrients are a major cause of ambient water quality impairments. The EPA's 1996 Section 305(b) report identified excessive nutrients as the leading cause of impairments to lakes and the second leading cause of impairments to rivers, after siltation. In addition, nutrients were the second leading cause of impairments reported by the states in their 1998 Section 303(d) lists. Nutrients, along with sediment, were the primary causes of impairments to the Chesapeake Bay and its tidal tributaries on the respective Maryland and Virginia Section 303(d) lists. To meet the objectives of the Clean Water Act, the EPA's implementing regulations specify that states must adopt criteria that contain sufficient parameters to protect existing and designated uses. Until 2000, the EPA had not published recommended quantitative water quality criteria for nutrients that states could adopt to protect uses.

In order to achieve and maintain water quality conditions necessary to protect the aquatic living resources of the Chesapeake Bay and its tidal tributaries from the effects of nutrient and sediment pollution, EPA Region III has developed *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll* a *for the Chesapeake Bay and Its Tidal Tributaries* (*Regional Criteria Guidance*). EPA Region III has also identified and described five habitats (or designated uses) that when adequately protected will ensure the protection of the living resources of the Bay and its tidal tributaries. Those five uses (described in Appendix A) provide the context in which EPA Region III derived protective Chesapeake Bay water quality criteria for dissolved oxygen, water clarity and chlorophyll *a* (see Figure 1 in the Executive Summary), which are the subject of the *Criteria Guidance*. EPA Region III has also published the *Technical Support Document for the Identification of Chesapeake Bay Designated Uses and Attainability*. This document provides further

information on the development and geographical extent of the designated uses to which the criteria may apply.

NATIONAL CRITERIA

Under the Clean Water Act Section 304(a), the EPA issues national criteria recommendations to states and tribes to assist them in developing their water quality standards. When the EPA reviews a state or tribal water quality standard for approval under 303(c) of the Clean Water Act, the agency must determine whether the adopted designated uses are consistent with the Clean Water Act requirements and whether the adopted criteria protect the designated use. The EPA's regulations encourage states and tribes, when adopting water quality criteria as part of their water quality standards, to employ the EPA's Section 304(a) guidance, to modify the EPA's 304(a) guidance to reflect site-specific conditions or to use other scientifically defensible methods to derive criteria to protect the designated uses.

REGIONAL NUTRIENT CRITERIA

In 1995 the EPA gathered a group of nationally recognized scientists and managers to address the national nutrient problem. They recommended that the agency avoid setting criteria for phosphorus or nitrogen that would apply to all water bodies and regions of the country. Instead they suggested that the EPA develop guidance (assessment tools and control measures) for specific bodies of water and ecological regions across the country and use reference conditions, which reflect pristine or minimally affected waters, as a basis for developing nutrient criteria.

Using these suggestions as starting points, the EPA published the *National Strategy for the Development of Regional Nutrient Criteria* in June 1998. The strategy articulated the EPA's intention to develop technical guidance manuals for four types of waters (lakes and reservoirs, rivers and streams, estuaries and coastal waters, and wetlands) and produce nutrient criteria for specific eco-regions. In addition, the EPA is committed to working with states and tribes to develop more refined and localized nutrient criteria based on approaches described in the water body guidance manuals. The *Regional Criteria Guidance* provides EPA's recommendations to the Chesapeake Bay states for use in establishing their water quality standards consistent with Section 303(c) of the Clean Water Act.

CHESAPEAKE BAY CRITERIA

The EPA's current guidance for dissolved oxygen can be found in the 1986 freshwater dissolved oxygen criteria and 2000 Virginian Province saltwater criteria documents. EPA Region III developed the criteria presented in this document by integrating and supplementing the scientific findings and data to fully protect specific Chesapeake Bay tidal-water habitats. The revised criteria are based on and consistent with the existing EPA dissolved oxygen criteria.

There are no national 304(a) criteria specific to chlorophyll *a* or water clarity. In accordance with sections 117(b) and 303 of the Clean Water Act, EPA Region III derived the water quality criteria addressing these critical nutrient and sediment enrichment parameters specifically to protect Chesapeake Bay living resources and their tidal-water habitats.

The water quality criteria presented in this document are designed to apply to the Chesapeake Bay and its tidal tributaries and embayments within the tidally influenced waters of the states of Maryland, Virginia and Delaware and the District of Columbia (Figure I-1). These criteria may also apply to other estuarine and coastal systems, with appropriate modifications.

The regional criteria and designated uses presented in this document and the *Technical Support Document* are the product of a collaborative effort among the Chesapeake Bay Program partners. They represent a scientific consensus based on the best available scientific findings and technical defining water quality conditions necessary to protect Chesapeake Bay aquatic living resources from effects due to nutrient and sediment over-enrichment. Various stakeholder groups have been involved in their development, with contributions from the staffs of federal and state governments, local agencies, scientific institutions, citizen conservation groups, business and industry. In the *Regional Criteria Guidance* the EPA recommends and expects that the numerical criteria and refined designated uses will be considered by and appropriately incorporated into the water quality standards of the Chesapeake Bay jurisdictions with tidal waters—Maryland, Virginia, Delaware and the District of Columbia.

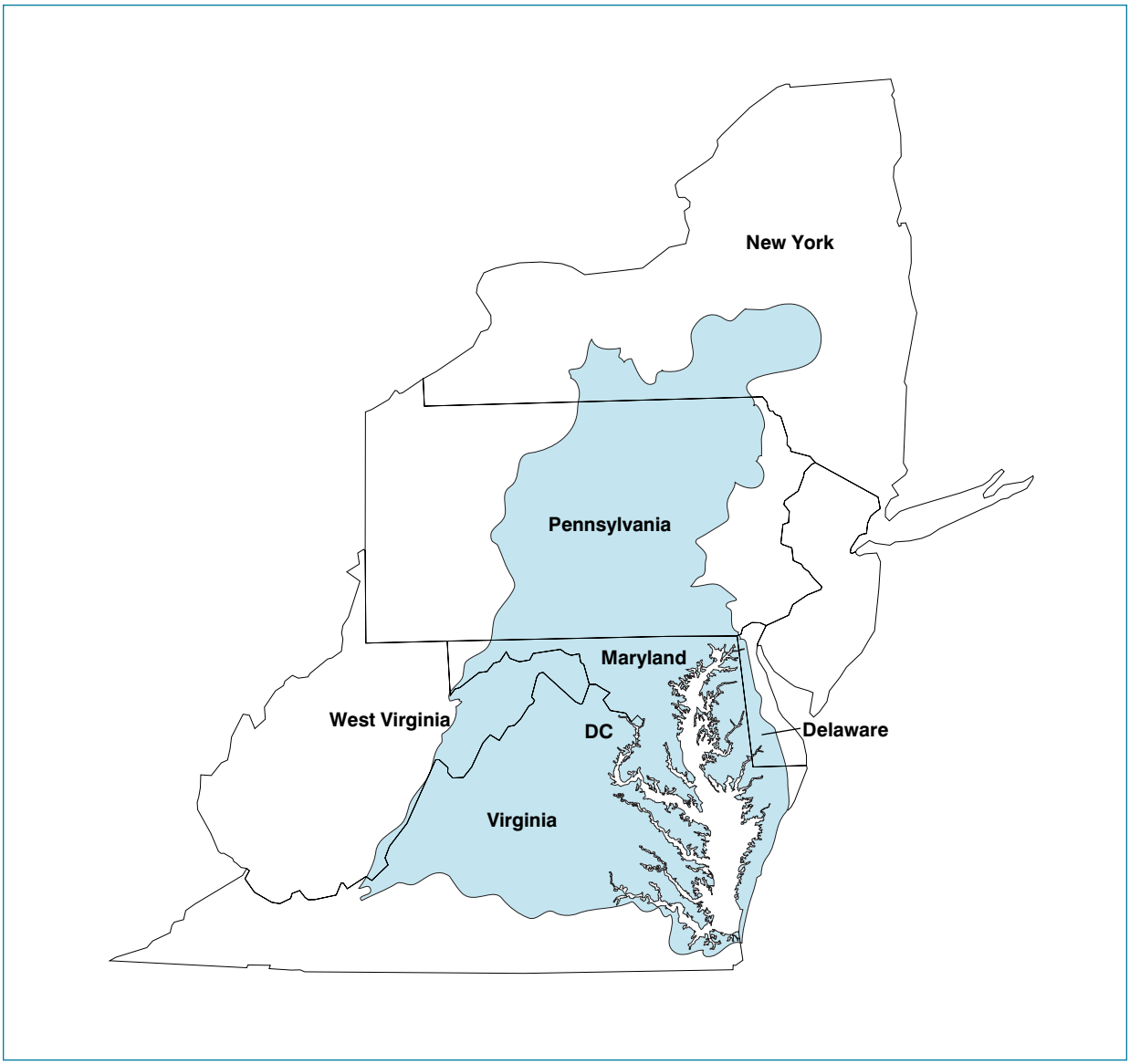

Figure I-1. The Chesapeake Bay watershed crosses the boundaries of six states—Maryland, Virginia, Delaware, Pennsylvania, New York and West Virginia—and the District of Columbia.