Critical Elements in the Application of Water Quality Standards to Wetlands: Classification System, Beneficial Use Designation and the Identification of Exceptional Wetlands

The development and implementation of water quality standards for wetlands is essential to ensuring the protection and enhancement of the Commonwealth's wetland resources. Water quality standards provide a link to other water quality management activities, including the following provisions of the federal Clean Water Act: permitting under Sections 402 and 404, control of nonpoint source pollution under Section 319, and water quality certification under Section 401, (requiring a certificate prior to any activity which may result in a discharge to state waters, also now called the Virginia Water Protection Permit).

Existing state wetlands management programs in Virginia include a tidal wetlands program at VMRC and a water quality permitting program at DEQ. The Commonwealth also conducts a tidal wetlands inventory program at VIMS, and has a cooperative wetlands mapping program with the National Wetlands Inventory Program. The five basic steps required in the process of applying state water quality standards regulations to wetlands include: inclusion of wetlands in the definition of "state waters;" designation of uses; adoption of aesthetic criteria and appropriate numeric criteria; adoption of narrative biological criteria; and the application of a state's antidegradation policy.

Currently, Virginia's comprehensive approach toward wetlands' water quality standards includes: wetlands classification; the development of functional assessment techniques; a functional analysis and vegetative characterization of Virginia's nontidal wetlands of the coastal zone; a review of current Virginia legislation, regulations and policy on wetlands and water quality standards; and a review of the application of water quality standards to wetlands in other states. This report discusses two possible approaches to wetlands classification and beneficial use designation: using existing water classification systems, or developing a system specifically for wetlands.

This report proposes a wetlands classification system which specifically addresses the diverse and complex nature of wetlands. It also discusses the incorporation of a wetlands classification scheme into Virginia Code in order to allow for the recognition of the various beneficial uses of different wetlands classes. This scheme includes Exceptional Wetlands, Riparian Wetlands (both Tidal and Nontidal), and Isolated Wetlands. Research continues to extend our current knowledge of wetland functions and the relationships between structure and function. As these studies become available, the proposed classification can be refined.

Virginia Institute of Marine Science
Contact: Carl Hershner or Pam Mason, 804.642.7380
May 1995
1992 Task 91, 1993 Task 91

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Virginia Wetlands Management Handbook

The **Virginia Wetlands Management Handbook** is a comprehensive single reference resource to laws, guidelines and policies pertinent to wetlands and dune management in Virginia. The handbook is specifically designed for use by Virginia's wetlands managers, particularly local wetlands board members and their staff, representing the experience and technical knowledge accumulated by the Virginia Institute of Marine Science (VIMS) in its nearly 25 years of operation. Given the necessary turnover involved with a decentralized volunteer management system, it is important that a handbook be available. A three-ring binder format facilitates easy access and is designed for expansion as new documents become available. The first edition of the handbook was completed in December 1991.

In addition to updated listings of local government contacts, relevant laws, guidelines and policies, the second edition of the handbook contains guidance papers on compensatory mitigation and shoreline erosion. Other sections contain Attorney General's Opinions pertinent to wetlands and dune management in Virginia, wetland plant descriptions, a segment on marinas, and a description of the permit process in Virginia. The respective roles of the Virginia Marine Resources Commission and VIMS in wetlands management are discussed. New local wetlands board appointees will find this handbook particularly helpful as they become familiar with their roles as wetland and dune managers. The handbook also includes technical reports and advisories published and distributed by the VIMS Wetlands Program.

Virginia Institute of Marine Science
Contact: Tom Barnard, 804.642.7383
January 1996
1990 Task 16, 1994 Task 16

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Wetlands Guidelines

Virginia's coastal zone is comprised of many different but highly interrelated ecological systems. Below the low tide lines are vast areas of submerged bottomland which are vitally important as fish and shellfish feeding, spawning and nursery habitat. These important ecological areas not only help support Virginia's highly valuable commercial fish catch, but also the myriad species which most Virginians rarely encounter.

Between the high-water line and the low-water line are the nonvegetated intertidal flats and beaches. These areas, though uncovered and seemingly devoid of life during a portion of each tidal cycle, provide important habitat for a host of different marine organisms, aquatic birds and mammals.

Various vegetated communities known as marshes are found above mean sea level. Best known for their high plant production on the order of tons per acre per year, marshes have other valuable functions. They are a buffer between the estuary and the upland; interacting with both.

The **Wetlands Guidelines Handbook** addresses marshes, beaches, tidal flats and subaqueous lands an their value. The handbook includes a brief decription of each wetland community type and a section which ranks the community types relative to each other according to their environmental values. Although all wetland types are important, where management decisions must be made regarding necessary economic development affecting wetlands, this ranking system may help in guiding development into lesser value wetland communities. Also included are general and specific guidelines for wetlands-disturbing activities.

Virginia Marine Resources Commission
Contact: Tony Watkinson, 757.247.2255
reprinted September 1993
1992 Task 9

❖

Nontidal wetland and adjacent aquatic habitat.
(VIMS Wetlands Program *Technical Report*, 1991 No. 91-A)

Critical Natural Areas, Exemplary Wetlands, and Endangered Species Habitats in Southeastern Virginia

The information presented in this report became part of a more comprehensive natural area study prepared for the entire Virginia portion of the Albemarle-Pamlico Estuarine Region (*See Habitat and Wildlife Management, page 15*) This report describes the findings of the 1991 natural heritage inventory of Southeastern Virginia. The inventory covers the counties of Prince George, Surry, and the cities of Chesapeake, Suffolk, and Virginia Beach. The goal of this inventory was to identify important rare plant and animal sites, as well as exemplary natural communities, with particular emphasis on wetland habitats.

Virginia Department of Conservation and Recreation
Contact: Chris Ludwig, 804.225.4855
March 1992
1990 Task 21

❖

Historical Losses of Wetlands Habitat in the Elizabeth River

This project attempted to document and quantify the losses of tidal wetlands that have occurred in the Elizabeth River in the recent past. The areas indicated as wetlands in a series of USGS topographic maps from the early 1940's were digitized and compared with the VIMS Tidal Marsh Inventory series from the late 1970's using GIS. This comparison indicated that approximately half of the tidal wetlands in the Elizabeth River were lost during the study period. A series of color maps were produced for the river depicting the following information: the 1944 shoreline, the 1977 shoreline, the 1944 tidal wetlands and the 1977 tidal wetlands. The results of this study should help wetlands management efforts in the Elizabeth River by identifying the magnitude of the losses that have occurred and potential sites for wetlands restoration projects.

Virginia Institute of Marine Science
Contact: Walter Priest, 804.642.7385
June 1996
1994 Task 23

❖

An Assessment of Wildlife Utilization between a Man-made Marsh, an Adjacent Natural Marsh, and a Nearby Natural Marsh

This study investigated the functions and values of man-made and natural tidal wetlands, and was among the first to use simultaneous sampling techniques to investigate animal use preferences between man-made and adjacent natural tidal wetlands.

This study determined that certain attributes of the man-made marsh resembled the natural marshes, such as temperature, dissolved oxygen, bird visitation, benthic macrofauna and fish diversity. However, data revealed some important differences between the man-made marsh and the natural marshes. The natural marshes were observed to function more effectively in a majority of the categories which are basic and primary structural components of the physical environment unique to tidal salt marshes. These include organic carbon content, salinity and vegetation. Other categories for which differences were observed included zooplankton abundance, marsh surface utilization, bird nesting sites, and use of the marshes by total fish, food fish and blue crabs. Some of these observed differences were seasonal.

The study discusses the many factors that need to be evaluated when the construction of a marsh is contemplated, including the question of whether a man-made marsh has the ability to mimic the functions and values of natural marshes. It goes on to suggest what should be included in a created wetland.

Recommendations for further research included: an expansion of the sampling procedures used in this study and the development of a formal method of comparison of mitigated natural areas with natural areas, an investigation of the importance of upland forest buffers, an investigation of the importance of these wetlands as nursery grounds for the blue crab, and further investigation of total dissolved organic matter versus utilizable dissolved organic matter in man-made and natural wetland systems.

Virginia Institute of Marine Sciences
Contact: Kirk Havens, 804.642.7386 or Carl Hershner, 804.642.7387
November 1992
1991 Task 9

❖

The Virginia Nontidal Wetlands Survey

The Virginia Department of Conservation and Recreation (DCR) was assigned the responsibility of developing a nontidal wetland inventory by the 1989 Virginia General Assembly. An interagency committee, the Virginia Nontidal Wetlands Inventory Committee (VNWIC), was established to provide guidance for this effort and ensure the highest level of utility for users of the inventory. The National Wetland Inventory (NWI) program at the U.S. Fish & Wildlife Service (USFWS) is the single most extensive and comprehensive source of nontidal wetland information for Virginia. DCR summarized the aerial extent of wetlands and deepwater habitats found in the NWI database for this inventory. The state soil survey program was also determined to be the next single largest source of related wetland information. Data on the aerial extent and location of these soils were summarized and also included, for representative 2.5 minute quadrangles for the Richmond southeast and the Norfolk northeast areas.

Virginia Department of Environmental Quality/
Virginia Department of Conservation and Recreation
Contact: Division of Soil and Water Conservation,
804.762.4320
March 1993
1991 Task 13

❖

Digitization of U.S. Fish & Wildlife National Wetlands Inventory Maps

The Commonwealth of Virginia received 139 new paper National Wetlands Inventory (NWI) maps from the U.S. Fish and Wildlife Service (USFWS) in 1993 (see 1991 Task 13 above). These maps were digitized and then converted by the DEQ's former EcoMAPS Program to an ARC/Info GIS format for broader distribution.

Virginia Department of Environmental Quality
Contact: Virginia Coastal Program, Laura McKay,
804.698.4323
March 1994
1992 Task 8

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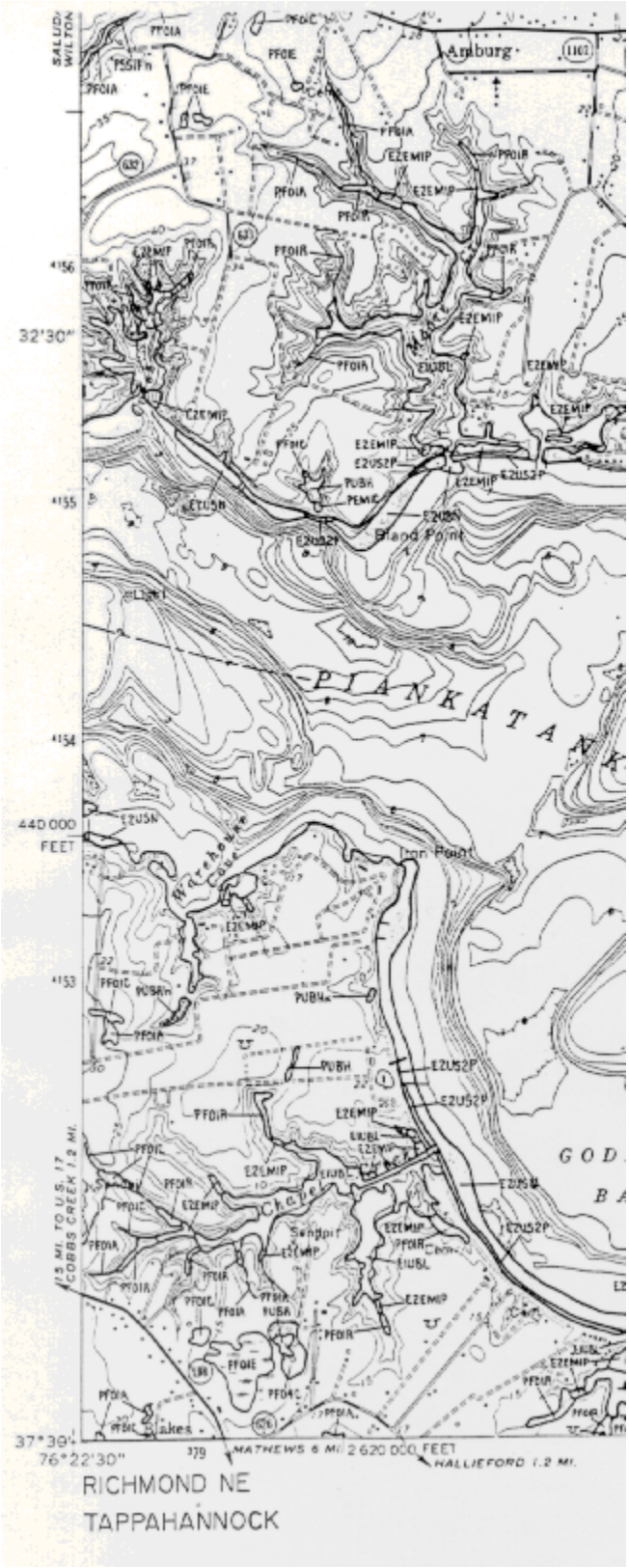

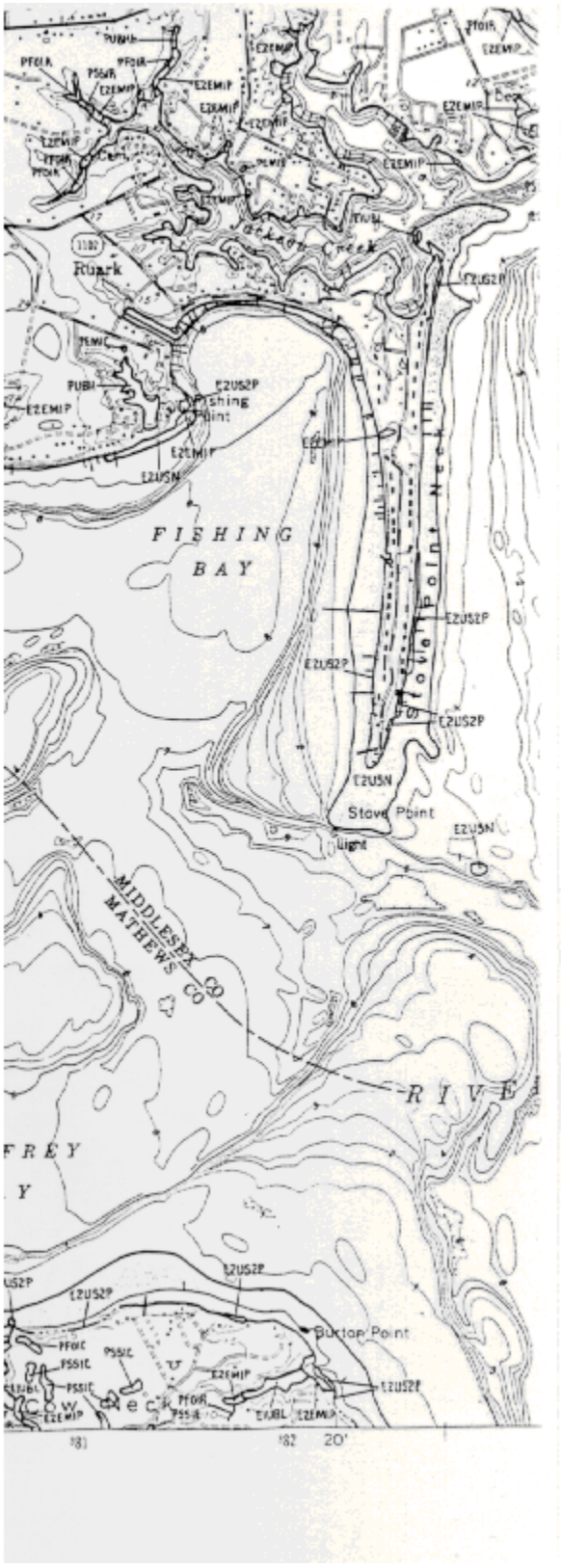

Back Bay and Richmond County Marsh Inventories

This report includes two marsh inventories: one for Back Bay and its tributaries in Virginia Beach and one for Richmond County. These documents completed the initial round of inventories for all political jurisdictions with tidal wetlands. These inventories were published using ARC-Info software, which permits multiple uses of the data and supports future analysis of wetland status and trends in a manner not possible with the old format.

These inventories are part of a series of county and city tidal marsh inventories prepared by the Wetlands Advisory Group of the Insititute of Marine Science. Please contact VIMS, or one of the numbers listed below, for a complete list of available inventories.

Virginia Institute of Marine Science
Contact: Gene Silberhorn, 804.642.7382 or Carl Hershner, 804.642.7387
November 1990
1989 Task 8

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Newport News Wetlands Survey and Analysis

Nontidal wetlands were identified in three designated project locations using standard and infrared aerial photography and National Wetlands Inventory maps. The results and findings of the wetlands investigations include inventories, field notes, data sheets, and maps of potential nontidal wetland areas.

City of Newport News
Contact: 804.247.8761
December 1991
1990 Task 56

❖

Virginia Wetlands: A Planning & Regulatory Perspective

An increase in the awareness of wetland values, coupled with concerns over wetland losses, has led to stricter federal and state measures to protect wetlands and other environmentally sensitive areas from the effects of uncontrolled development. One purpose of this report is to discuss wetland definitions, functions, and wetland protection measures. Another is to examine what local governments can do to preserve these natural areas by integrating wetland protection into other planning activities.

Richmond Regional Planning District Commission
Contact: Larry McCarty, 804.358.3684
January 1991
1990 Task 34

❖

The Use of Aerial Photographs in Identifying Wetland Permit Violations

The use of aerial photographs and aerial surveillance are excellent methods for identification and inspection of apparent wetlands violations. Photographs taken at both low and high altitudes were compared to evaluate relative cost-effectiveness, utility, and replicability for use in other jurisdictions.

As part of its 1993 Technical Assistance grant, and as a result of its earlier grant project, NVPDC conducted low-level aerial photographs of the Prince William County shoreline to aid the county wetlands board in identifying wetlands permit violators. The use of an ultra-light aircraft allowed NVPDC staff to target areas for closer inspection.

Northern Virginia Planning District Commission
Contact: David Bulova, 703.642.0700
September 1992, Fall 1994
1991 Task 65, 1993 Task 31

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Surry County Wetlands Zoning Ordinance

Surry County adopted this wetlands zoning ordinance to prevent the destruction of wetlands, while accommodating necessary economic development in a manner consistent with wetlands preservation. Activities in the county which may effect wetlands must be reviewed and approved by the Surry County Wetlands Board, established through this grant.

County of Surry
Contact: 804.294.5210
March 1992
1990 Task 65

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A Regional Wetlands Policy Plan for the Crater Region

The purpose of this project was to present background information on the issues surrounding both tidal and non-tidal wetlands, as well as current discussion of the national perspective on "no-net loss" policy, and the effects of this policy on the Chesapeake Bay region. Present policy directions appropriate for consideration by the Crater Region's Tidewater communities are discussed.

Crater Planning District Commission
Contact: Victor Liu, 804.861.1666
September 1991
1990 Task 35

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See Also:
Public Education, page 72:
Constructed Wetlands Conference
Public Education, page 72:
Wetlands Newsletter and Technical Reports
Public Education, page 73:
Wetlands Education Curriculum
Public Education, page 73:
Coping with Wetlands Workshop Series