VIRGINIA STATE WETLANDS PROGRAM PLAN

Plan years 2015-2020

Submitted by The Department of Environmental Quality

In Collaboration with Virginia Institute of Marine Science -

Center for Coastal Resources Management

And Virginia Marine Resources Commission

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EXECUTIVE SUMMARY

This Wetland Program Plan (WPP) is the second iteration of the planning effort prepared at the direction of the Environmental Protection Agency (EPA), and summarizes (1) the multiple existing regulatory and voluntary wetland program elements in Virginia, (2) identifies opportunities for improvements in current program objectives and operations, and (3) prioritizes program development to achieve an effective and comprehensive program strategy. This WPP provides a framework to improve its wetland programs over the next five years (2015-2020) with incorporation of action items to address wetland management issues.

The WPP describes Virginia's efforts in four core element areas, plus three additional areas identified by Virginia as critical to the achievement of wetland no-net-loss and net resources gain. The EPA has identified these four core elements as 1) monitoring and assessment, 2) regulation, 3) voluntary restoration, and 4) water quality standards for wetlands. However, long term sustainability of wetland resources in Virginia necessitates actions in other areas. We have added 3 additional element areas: Planning and sustainability, Information Acquisition and Outreach/Education. Inclusion of these elements, along with the EPA core elements, creates a comprehensive perspective on Virginia's wetland resources and facilitates a plan to address those resources.

In Virginia, two agencies, 40 citizen Boards and one academic institution are primarily responsible for the management of wetland resources. The Department of Environmental Quality (DEQ) has jurisdiction over all wetlands both tidal and nontidal under the State Water Control Law. The Virginia Marine Resources Commission (VMRC) administers and has oversight over a state-local program which enables local government to adopt responsibility for tidal wetland permit program administration. The Virginia Institute of Marine Science is mandated by statute to provide advisory support to both DEQ and VMRC. Specific wetland mandates include provision of advice to the State Water Control Board on no-net-loss and net wetland gain in area and function; the provision of comprehensive guidance for tidal shorelines, including tidal wetlands to promote living shorelines and address wetland sustainability; maintenance of a tidal wetland inventory, and assistance to the VMRC on wetland guidance development.

Programmatic descriptions relative to the core elements in the first plan (identified as the Comprehensive Wetland Program Plan, Commonwealth of Virginia, dated 2011 – 2015) are generally still accurate. Explanations are provided herein where notable changes have occurred.

The WPP identified seventeen objectives in the first plan for 2010-15. Virginia has completed eleven objectives, some of which are processes that are still on-going and are again included in this plan as objectives. Four objectives were partially completed and two have not yet started. A table of the objectives and their status can be found in Appendix A.

Most of the work from the previous plan was accomplished with funding support from EPA, as well as funding from NOAA and others, in addition to resources within the state agency (DEQ, VIMS, VMRC, etc.). Given the current state funding outlook, federal and other outside funding is critical to the ability to work on Wetland Plan objectives.

I. INTRODUCTION

Virginia has an exceptional wetland diversity occurs across the landscape. Swamps, streams, tidal marshes, wet meadows, bogs, pocosins, and sinkhole wetlands are just some of Virginia's wetland communities. Wetland loss and modifications, whether they are primary, secondary and/or cumulative, can adversely impact the role of wetlands in providing valuable ecosystem services, in particular, habitat and water quality services.

A comprehensive wetland plan to address the achievement of no-net-loss and a net wetlands gain should include core elements, as defined by EPA:

1. Monitoring and Assessment
2. Regulation
3. Voluntary Restoration, and
4. Water Quality Standards for Wetlands.

We also believe it is important to address planning for coastal wetlands sustainability in the face of sea level rise, including critical information needs and education and outreach efforts.

This plan summarizes efforts on the core elements, plus additional elements identified as critical to Virginia wetlands. Where needed, action items are identified to address gaps, or strengthen existing efforts for each element.

Statewide Wetland Resources

Virginia has approximately 1 million acres of wetlands. An estimated 75% of these acres are palustrine vegetated wetlands, and the remaining 25% of these acres are estuarine wetlands. Approximately 71% of the wetlands in Virginia are in the Coastal Plain, with another 20% in the Piedmont and the remaining 9% in the other physiographic provinces (Tiner and Finn 1986). Virginia is believed to have lost about 40 percent of its original complement of pre-colonial wetlands (National Water Summary on Wetland Resources, *United States Geological Survey Water Supply Paper 2425)*.

A study of wetland trends in Southeastern Virginia for 1994-2000 showed a net loss of 2,100 acres (1.3%). The actual loss of vegetated wetlands was even higher, but offset by a gain in pond and open water area. The loss of palustrine wetlands was primarily due to conversion to uplands, while estuarine wetlands were lost through conversion to open water (Tiner, et.al. 2005).

Threats and Stresses to Wetlands

While some of the primary threats and stresses to Virginia's wetlands are dependent upon whether the wetlands are non-tidal or tidal, others affect both tidal and non-tidal wetlands. The following list summarizes the major causes of wetland loss in Virginia (Tiner and Finn 1986, Tiner, et al. 2005).

1. Conversion to other land cover – The greatest risk to wetlands in Virginia is conversion to another land cover. These conversions are caused by development and sea level rise. Nontidal wetlands are lost through conversion to uplands. Development conversion is the primary threat. Reservoir and impoundment projects convert nontidal wetlands to open water. Tidal wetlands are lost through conversion to open water and uplands. Conversion to uplands is most commonly associated with shoreline erosion control structures. The conversion of non-tidal adjacent wetlands to tidal wetlands and tidal wetlands to open water is caused by sea level rise.
2. Ecosystem Service modifications associated with climate change – Climatological changes in rainfall and storminess are projected to have significant effect upon wetlands hydrology. While nontidal isolated wetlands maybe of greatest risk, changes in the timing and extent of water inputs to all wetlands can lead to changes in vegetative community and biogeochemical processes impacting habitat and water quality services.
3. Conversion to Other Uses - This threat is most common for non-tidal temporary and seasonal wetlands that are easier to convert. These threats involve managing wetlands as residential lawn or gardens, timbering, stock-pile storage, and temporary fill. These conversions are generally associated with residential and commercial development.
4. Hydrologic Alterations - Diversions, stream channelization, ditches, etc. can divert or prevent water from reaching wetlands resulting in a change in wetland type or possible conversion to upland.
5. Invasive species – There are a number of species that can be invasive in wetlands. Two plants species of concern are purple loosestrife (*Lythrum salicaria*) and common reed (*Phragmites australis*). These species can form dense monotypic stands that reduce habitat and wildlife diversity. *Phragmites* is identified as one of 22 plant species ranked as highly invasive by the Department of Conservation and Recreation (DCR).
6. Fragmentation - Fragmentation of wetlands by development, crop fields, roads, fences, berms, or other factors limits or eliminates ecosystem services, notably habitat and water quality. Fragmentation, and associated disturbance, can also lead to increased invasion by non-native and aggressive species lik*e Phragmites*. (See Appendix D for an expanded list of stressors used in the wetland monitoring and assessment effort).

Chesapeake Bay Commitments

A new Chesapeake Bay agreement was signed in June 2014. The agreement included new commitments for Partnership, including a new Wetlands outcome under the Vital Habitats Goal. The **Wetlands Outcome:** Continually increase the capacity of wetlands to provide water quality and habitat benefits throughout the watershed. Create or reestablish 85,000 acres of tidal and non-tidal wetlands and enhance function of an additional 150,000 acres of degraded wetlands by 2025. These activities may occur in any land use (including urban), but primarily occur in agricultural or natural landscapes. Virginia has agreed to the Major Desired Outcome for Wetlands (Chesapeake Bay 2000 Agreement, Subsection 2.3) to "(i) achieve no net loss of existing wetland acreage and function through regulatory programs; (ii) achieve net wetland resource gain through wetland restoration; and (iii) assist local governments and community groups with development of wetland preservation plans as part of integrated locally based watershed planning." Under the 2010 Agreement, Virginia had committed to restoring 6,000 new acres of wetlands by 2010 within Virginia's portion of the Chesapeake Bay. In addition, Virginia has set a goal of restoring 4,000 acres outside of the Bay drainage, for a total of 10,000 new acres statewide.

Priorities

Virginia is committed to a net resource gain of wetlands and the enhancement of wetland ecosystem services. In order to achieve that commitment, Virginia will need to address all of the threats to wetlands. This will require coordinated efforts to better understand the wetland resources and effects of the threats and stressors, effectively manage the resource, improve communications to the public and decision makers to ensure better decision-making and compliance, enhance planning activities, and find efficiencies in integration of wetlands programmatic efforts with other water quality and habitat regulatory and non-regulatory programs, processes and products. Virginia plans to focus effort for the 2015-2020 time period on the greatest causes of wetlands loss and change and has proposed objectives and actions to address those factors. Several issues need to be addressed in order to preserve and enhance Virginia's wetland resources.

Virginia has identified several issues as priorities. These priorities include, but are not limited to, the following:

1. Direct loss and secondary impacts from development;
2. Loss of tidal wetlands due to sea level rise and adverse ecosystem effects on all wetlands due to climate change;
3. Obtain, share, and incorporate new land cover data, tax maps, non-mapped wetlands, and other agency data as needed to enhance Virginia's Wetland Condition Assessment Tool (WetCAT).
4. Update computer software technology in order to maintain programs such as WetCAT that are capable of assessing impacts to Virginia's wetland resources.

II. MONITORING AND ASSESSMENT

A monitoring and assessment program is defined as the establishment and operation of appropriate devices, methods, systems and procedures necessary to monitor, compile, and analyze data on the condition of wetlands (adapted from Elements of a State Water Monitoring and Assessment Program, March 2003). Monitoring is the systematic observation and recording of current and changing conditions, while assessment is the use of that data to evaluate or appraise wetlands to support decision-making and planning processes. Wetlands can be characterized both by their condition and by functions. Wetland condition is the current state as compared to reference standards for physical, chemical, and biological characteristics, while functions represent the processes that characterize wetland ecosystems.

The overarching goal of Virginia's wetland monitoring and assessment strategy is to develop a long-term implementation plan for a wetland monitoring and assessment program that protects the physical, chemical, and biological integrity of the Commonwealth's water resources, including wetlands. In order to accomplish this goal, it is critical to first know the status of wetland resources in Virginia, in terms of location and extent of wetlands in each watershed, and have a general knowledge of the quality of these wetland resources. Secondly, the functions of wetland resources impacted through our permitting program must be accurately evaluated to determine those functions to be replaced through compensatory mitigation. It is also important to assess the degree to which the required compensatory mitigation is performing in relation to those impacted functions.

The monitoring and assessment strategy follows the "Elements of a Wetland Monitoring and Assessment Program Checklist" developed by the United States Environmental Protection Agency (EPA) in October 2002, as well as the Elements of a State Water Monitoring and Assessment Program (EPA 841-B-03-003, March 2003) and Application of Elements of a State Water Monitoring and Assessment Program for Wetlands (unpublished draft, July 2005).

The assessment method is a multi-service model that involves three levels of data collection. The Level II and Level III sampling are intended to calibrate and validate the model that is applied at the Level I (model development) stage. The data collections are not designed to operate independently. The method characterizes the capacity of the wetland to provide water quality and habitat services using remotely sensed data. The underlying models are based on existing research. They specify the combination of landscape level parameters that are most likely predictive of these capacities. The model application produces a relative score for each wetland for each service. The scores are then refined and calibrated by site visits to randomly selected wetlands. The relationship between structure and function is validated by intensive study of ecological service endpoints.

Current Efforts

Virginia's wetland monitoring and assessment program is being implemented through a cooperative agreement between DEQ and the Center for Coastal Resources Management at the Virginia Institute of Marine Science (CCRM) using funds awarded through EPA's Wetland Program Development Grants to continue these efforts. DEQ has received nine grant awards from EPA for this initiative, and Virginia is recognized as one of five states leading this initiative nationally. Parameters used in the assessment reflect information from published literature, with consideration of on-going work being conducted through the Mid-Atlantic Wetland Workgroup (MAWWG), regarding each parameter's validity, usefulness, and utility for field data collection.

A level I assessment based on type and surrounding landscape has been completed for all wetlands in Virginia. Each wetland area is given a separate score for habitat and for water quality. The assessment was done using existing data sets from the National Wetlands Inventory (NWI), Landsat Thematic Mapper (TM) satellite, protocols developed by the Coastal Change Analysis Program (CCAP) of the National Oceanic and Atmospheric Administration (NOAA), U.S. Geologic Survey National Elevation Dataset (NED), and Digital OrthoPhoto Quads. The parameters chosen for Virginia's Level I assessment wetland quality score include: (i) wetland size, (ii) wetland type, (iii) wetland hydroperiod; (iv) proximity to other wetlands; (v) proximity to roads and highways, (vi) density of roads and highways; and (vii) percent land cover (immediately adjacent to the study wetland, at a 200 meter radius from the study wetland, and at 200-1000 meter radius from the study wetland). The data set will be updated periodically, when resources allow, as revised land cover and NWI maps are updated.

Level II and III assessments have proceeded by physiographic province from the coastal plain to piedmont to the ridge and valley with a sampling effort succeeded by model validation. This phase of the assessment and monitoring effort is complete. The current phase is the re-calibration of the stressors by landcover to verify the correlation of stressor type to landcover and validate the use of landcover for condition assessment scoring. The first recalibration effort was done for the coastal plain, followed by the piedmont and ridge and valley.

The data collected has been compiled into a wetland data viewer created by CCRM with substantial input from DEQ. The goal is to automate the processing of database information through GIS necessary to support DEQ's regulatory decision-making, allow reporting of wetland condition, and provide information for policy development. In particular, information derived from monitoring is used to:

1. Report ambient wetland conditions in Virginia's Clean Water Act (CWA) Integrated 305(b)/303(d) report;
2. Assist in the evaluation of environmental impacts to wetlands of proposed projects during permit review as part of Virginia's regulatory program, including

an assessment of cumulative impacts to wetlands and water quality within a given watershed;

3. Evaluate the performance of wetland restoration and other compensatory wetland mitigation in replacing wetland acreage and function, including changes in wetland condition over time based upon surrounding landscape changes and maturity of the mitigation site; and
4. Evaluate the cumulative impacts of wetland loss and restoration in watersheds relative to ambient ecological conditions and water quality management needs.

Critical to the monitoring and assessment program, as well as to other wetland core elements, is accurate, timely, and iterative landcover data. Such data is required to assess wetland condition, track status and trends, and plan for integrated wetland restoration, preservation, and retreat in the face of sea level rise. The acquisition and provision of landcover data is needed to enable an accurate and effective picture of our wetland resources.

Wetlands Dataviewer – WetCAT

A web-based, geospatial wetlands dataviewer, identified as WetCAT (Wetland Condition Assessment Tool), has been built from data collected and compiled by DEQ and CCRM. The uses of the WetCAT are many, but one important application is to support DEQ's regulatory decision-making for wetland permits. The Virginia Department of Transportation (VDOT) expressed interest in the WetCAT to enable better planning and assist in transportation project permitting. Modifications of the current viewer were made to meet the specific needs of VDOT particularly when planning for linear projects during their National Environmental Policy Act (NEPA) documentation process. Updates to the viewer as new data becomes available are ongoing.

III. REGULATION

Background

In Virginia, wetlands are managed primarily by two state agencies operating under corresponding state law; the Department of Environmental Quality implements the Nontidal Wetlands Act and the Virginia Marine Resources Commission (VMRC) has state oversight of the local cooperative implementation of the Tidal Wetlands Act.

The U.S. Army Corps of Engineers (Corps) was delegated the authority from EPA under the federal Clean Water Act and the River and Harbors Act to manage wetlands. In 2001, the Corps issued a State Programmatic General Permit (SPGP-01) to Virginia. This permit was modified in 2007 (07-SPGP-01), and again in 2012 (12-SPGP-01) to authorize impacts to nontidal wetlands or waters less than one acre or 2,000 linear feet of streams. The 2015 annual review under that permit can be found here:

http://www.deq.virginia.gov/Portals/0/DEQ/Water/WetlandsStreams/Wetlands_Status_and_Trends_Report_Aug2015.pdf

Additionally, there are state and federal advisory agencies linked to wetland permit review. These entities include: the Virginia Institute of Marine Science (VIMS), with a mandate for general advisory service and specific responsibilities under the Tidal Wetlands Act; the Virginia Department of Game and Inland Fisheries (DGIF); the Virginia Department of Conservation and Recreation (DCR), the Virginia Department of Historic Resources (DHR); the federal National Resource Conservation Service (USDA-NRCS; the U.S. Fish and Wildlife Service (USFWS); and the National Marine Fisheries Service (NOAA-NMFS).

VIMS is mandated by state law to provide scientific advisory support to state agencies including DEQ and VMRC.

Virginia uses a Joint Permit Application to facilitate permit processing within and between the Corps, state and local authorities, federal authorities, and advisory agencies.

Virginia Water Protection Permit

The Virginia Water Protection Permit Program (VWP)is administered by DEQ's Office of Wetlands & Stream Protection. This program serves as Virginia's Section 401 certification program for federal Section 404 permits issued under the Clean Water Act. State law requires that a VWP permit be obtained before disturbing a wetland or stream by clearing, filling, excavating, draining, or ditching. Application is made through the Joint Permit Application process for concurrent federal and state project review. DEQ can provide Section 401 Certification through issuing a VWP individual or general permit or by issuing Section 401 certification for the Corps nationwide or regional permits.

State Water Control Law (Va. Code § 62.1-44.3) and VWP regulations (9 VAC 25-210-10 *et seq.*) define "State waters" as "all water, on the surface and under the ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction, including wetlands." The definition of wetlands for purposes of the VWP is same as the federal definition (CFR 33 part 328). "Wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. (§ 62.1-44.3).

Mitigation Banks

In Virginia and across the country there is a trend toward a large-scale watershed approach to providing compensatory mitigation. This is reflected in the 2008 Federal Mitigation Rule issued by the Corps. DEQ is the co-chair of the Interagency Review Team, which reviews and authorizes mitigation banks and in-lieu fee funds in Virginia. Mitigation banks tend to be more numerous in watersheds with the most permitted impacts. A list of "DEQ-approved wetland mitigation banks" can be found on RIBITS *(Regulatory In Lieu Fee and Bank Information Tracking System).* Click on the RIBITS Handbook for additional information.

Tidal Wetlands Act

The Tidal Wetlands Act (Va. Code §28.2-1300 *et seq*.) established a state-local program model giving regulatory authority over tidal wetlands to the VMRC, with the option for Tidewater localities to assume the primary regulatory responsibility. Localities are allowed to adopt a model ordinance and regulate tidal wetlands through a citizen Wetland Board with oversight by the VMRC. The intent of the law is to balance preservation and use of tidal wetlands in order to protect the ecosystem services they provide. Those services are specifically identified to include: production of wildlife, waterfowl, finfish, shellfish and flora; protection against floods, tidal storms, and erosion; absorption of silt and pollutants; and provisions for recreational and aesthetic opportunities. Currently, the ordinance is administered by 34 Tidewater counties and cities, and 2 towns. Twelve localities have not adopted the ordinance and the VMRC acts as the permitting authority for those locales.

The Tidal Wetlands Act defines tidal wetlands as:

1. "Vegetated wetlands" means lands lying between and contiguous to mean low water and an elevation above mean low water equal to the factor one and one-half times the mean tide range at the site…" and
2. "Nonvegetated wetlands" means unvegetated lands lying contiguous to mean low water and between mean low water and mean high water…" (§ 28.2-1302).

The Virginia "Living Shorelines Act" was passed in 2011. This legislation made several significant changes to the tidal wetlands regulatory program. First, the legislation codified the State's preference for the use of living shorelines to address tidal shoreline erosion. The legislation also mandated three actions:

1) Development of a general permit for living shorelines lead by VMRC
2) Development of comprehensive guidance for shorelines to include preferred management approaches and consideration for wetland sustainability (VIMS lead)

3) Development of integrated management guidance that seeks to simply the exiting shorelines guidance and regulation (VMRC lead). http://law.lis.virginia.gov/vacode/title28.2/chapter1/section28.2-104.1/

In 2014, a minor modification was made to the legislation to clarify question over the issuance of one permit for 2, or more, legislative jurisdictions (subaqueous land, tidal wetlands, dunes, beaches, riparian buffers). The modification added living shorelines to activities exempt from the tidal wetland act permit and the Coastal Primary Sand Dune permit if all other conditions are met. This enables the VMRC to issue one permit for all actions except for riparian buffer modifications.
http://law.lis.virginia.gov/vacode/title28.2/chapter13/section28.2-1302/ and
http://law.lis.virginia.gov/vacode/title28.2/chapter14/section28.2-1403/

Living Shorelines

Application of living shoreline designs has become a widely accepted and preferred strategy for tidal shoreline management. Because these designs entail a system-level approach, living shoreline treatments reflect the best understanding of how shoreline systems work, and how the benefits they provide can be sustained. For these reasons, promoting the use of living shorelines is seen as desirable by resource managers and scientific advisors across the nation.

However, in order for a living shoreline design to be implemented, one or more of the agencies involved in shoreline management may have to accept impacts within targeted resources. This means that successful promotion of living shorelines will require cooperative efforts by the regulatory and advisory authorities.

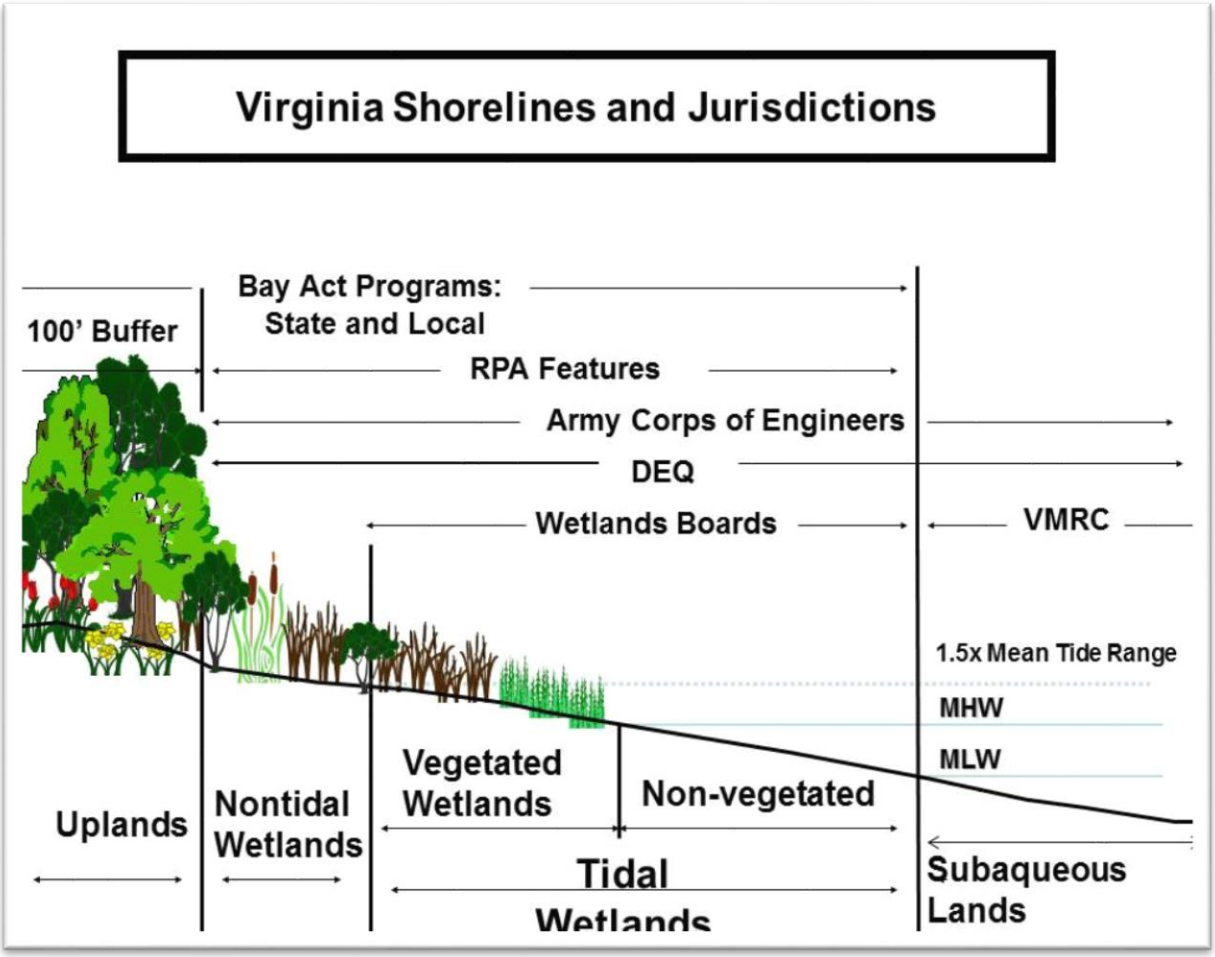
Virginia has pursued efforts to promote the use of living shorelines. While there are many options for promotion of living shorelines in Virginia, the recommendation put forth in a report to the Governor and General Assembly of Virginia, as mandated by Senate Joint Resolution 35 of the 2010 Assembly (CCRM, VIMS, 2010), was for the development of a general permit. This recommendation was included in legislation passed in the 2011 Session of the General Assembly in Senate Bill 964.

Chesapeake Bay Preservation Act

Tidal wetlands and non-tidal wetlands adjacent to tidal wetlands are also considered Resource Protection Areas (RPAs) under the Chesapeake Bay Preservation Act (Va. Code §10.1-2100 thru 10.1-2116). This law covers all Tidewater localities and provides an option for all other localities in the Commonwealth to adopt the program as well. The program adds to local land use and other ordinances establishing criteria for the use, development and re-development of land, and further establishes limitations on land uses permitted within RPAs. The operational definition for nontidal RPA wetlands is "... those wetlands other than tidal wetlands that are inundated or saturated by surface or

ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the U.S. Environmental Protection Agency pursuant to § 404 of the federal Clean Water Act, in 33 CFR 328.3b." (9 VAC 10-20-40) which are "connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow" (9 VAC 10-20-80).

In 2012, Virginia implemented an Integration Bill that moved several programs from the Department of Conservation and Recreation to DEQ in order to integrate the management of Virginia's water resources. The CBPA provisions are now under regulatory and administrative purview of the State Water Control Board and DEQ. http://lis.virginia.gov/cgi-bin/legp604.exe?131+ful+CHAP0756



IV. VOLUNTARY PROTECTION AND RESTORATION

Wetland protection is defined as removing a threat or preventing the decline of wetland conditions (US EPA, 2007).

Wetland restoration is the manipulation of a former or degraded wetland's physical, chemical, or biological characteristics to return its natural functions. Restoration practices include:

- Re-establishment, the rebuilding a former wetland; and
- Rehabilitation, repairing the functions of a degraded wetland (US EPA, 2007).

Tracking voluntary wetlands protection and restoration data in Virginia has proven to be a difficult task. While many voluntary activities throughout Virginia result in restored and preserved wetlands, there is not a single comprehensive data source for tracking voluntary restoration or creation of wetlands that occur outside of a regulatory program. Various non-governmental groups and federal government entities are known to have restored, purchased, or otherwise protected through easements many acres of tidal and non-tidal wetlands. The restoration projects have been undertaken by groups such as The Nature Conservancy, the Chesapeake Bay Foundation, the Department of Defense, the Living River Restoration Trust (formerly, the Elizabeth River Project), and others. The Virginia Department of Game and Inland Fisheries (DGIF) has worked to facilitate and affect the voluntary creation and protection of significant acreage of non-tidal wetlands.

In addition to the importance of these data from a Virginia perspective, the data is necessary for tracking restoration goals set by EPA's Chesapeake Bay Program. The Wetland Assessment Team of the Chesapeake Bay Program works to collect these data from all Bay partners, which are then compiled and reported for the Bay watershed.

Virginia has made several unsuccessful attempts to collect data on the types of voluntary restoration projects. The Department of Conservation and Recreation (DCR), DEQ and VIMS have all attempted to gather this data. Virginia needs an effective collection and reporting system for voluntary wetland restoration. This need also highlights the potential benefits of improved coordination among the regulatory and non-regulatory entities with regard to restoration targeting and project planning.

V. WATER QUALITY STANDARDS FOR WETLANDS

Water quality standards are the foundation of the water quality-based pollution control program mandated by the Clean Water Act (CWA). They define the goals for a water body by designating its highest attainable uses, setting criteria that reflect the current and evolving body of scientific information to protect those uses, and establishing provisions to protect water bodies from further degradation. Federal regulations (40 CFR part 230.3) implementing the CWA include wetlands as "waters of the U.S." and therefore require water quality standards. Water quality standards developed specifically for wetlands help ensure that the provisions of the Clean Water Act, which apply to all surface waters, are consistently applied to wetlands; they also provide a more relevant scientific basis for applying these provisions. Water quality standards (WQS) regulations at 40 CFR Parts 131 and 132 provide specific requirements for development of state and tribal standards including specifying appropriate water uses to be achieved and protected, providing appropriate criteria to support those uses, and applying anti-degradation policies to all waters, including wetlands. The regulation also provides states and tribes with the flexibility to adopt sub-categories of uses and associated criteria to allow for differentiation between types of wetlands, their expected uses, functions and condition.

The EPA 1990 guidance on WQS for wetlands states five key steps for developing water quality standards for wetlands:

(1) define wetlands as "state waters";
(2) designate uses that protect the structure and function of wetlands;
(3) adopt narrative criteria and appropriate numeric criteria in the standards to protect the designated uses;
(4) adopt narrative biological criteria in the standards; and
(5) extend the anti-degradation policy and implementation methods.

Virginia has defined state waters as all surface and groundwater including wetlands (§ 62.1-44.3) and assigned the following designated uses:

- Recreation, eg. swimming and boating;
- Aquatic life, including game fish;
- Wildlife;
- Production of marketable fish and shellfish (9 VAC 25-260-10 A.)

Narrative water quality standards for all state waters, including wetlands have been adopted. The “free forms” are found in the general criteria and include substances

attributable to industrial, sewerage or other waste that would interfere with the designated use of the waterbody. Numerical criteria for oxygen, pH and temperature assigned by waters class, toxicants, and for specific uses and certain water bodies are found in 9 VAC 25-260 *et seq*.

Virginia does not have narrative and numeric criteria specific to wetlands. Virginia does have Class VII Waters called swamp waters, which have a special pH standard.

VI. PLANNING and SUSTAINABILITY

The sustainability of wetland resources in the Commonwealth requires management and planning actions that interface with the EPA Core Elements, and could be considered partially contained by the Core Elements, but are best described and discussed separately.

Tidal wetlands are subject to both natural and human pressures. These pressures include: the effects of shoreline hardening, losses due to erosion and land conversion, and marsh drowning from relative sea level rise. Tidal wetland losses can be attributed to human activities, as well as erosion and sea level rise. Most of the human impacts have resulted from activities that were allowed through the permit process. These impacts have been approved after a public interest review finding that the public and private benefits outweigh the public and private detriments.

Filling, clearing, and armoring shorelines for many different reasons have resulted in cumulative impacts to tidal wetlands for some time. According to the report, *Status and Trends of Wetlands in the Coastal Watersheds of the Eastern United States, 1998 to 2004* (Stedman and Dahl 2008), about 18 percent of all coastal wetlands losses are tidal salt marsh. In Virginia, permitted impacts to tidal wetlands from 1993 to 2003 amounted to approximately 42 acres (Duhring 2004).

The cumulative losses of tidal wetlands and watershed development are having adverse effects on the health of Virginia's tidal waters and the animals that inhabit them. Shoreline alteration linked with watershed land development has been shown to have negative effects on water quality and a wide variety of aquatic animal populations including blue crabs, finfish, marsh birds, and the communities of organisms living in the nearshore sediments underwater (Lerberg *et al*. 2000; DeLuca *et al*. 2004; King *et al*. 2005; Bilkovic *et al*. 2006; Seitz *et al*. 2006; Bilkovic and Roggero 2008).

Current trends suggest tidal marshes will not be able to maintain themselves at present and projected future rates of sea level rise. In fact, estimates of tidal wetlands, beach, and riparian land loss in Virginia due to sea level rise are in the thousands to tens of thousands of acres (NWF 2008). As such, the sustainability of tidal and riparian shoreline resources will largely depend upon the capacity of the resources to move landward. In Virginia, this capacity is increasingly at risk. The capacity of marshes to

migrate landward onto vacant land is limited by the high rate of anticipated development and the routine approval of shore protection structures in Virginia and throughout the Atlantic Coast (Titus *et.al*. 2009). In a recent study conducted by VIMS, development was estimated to cover about 27% of tidal shorelines, and about 500 miles of Virginia's shorelines are now hardened.

Maintaining the capacity of Virginia's tidal shoreline resources to provide valuable services will require planning to accommodate their need to migrate on the landscape. Plans of this sort would be comprehensive allowing for both well informed permit decision-making in the near-term, as well as future, long-term planning.

Comprehensive coastal resource management guidance is under production at CCRM. The guidance is served through portals created at the scale of individual localities. Local conditions are inventoried, risks to both natural and human resources are assessed, preferred shoreline management strategies are identified, and opportunities to provide for future shoreline resources are delineated. Chesapeake Bay Act localities are required to address shoreline erosion in their local comprehensive plans. The CCRMPs developed by the state, for the localities, could be readily incorporated to meet that requirement. These plans were recommended as an approach to achieve sustained protection of tidal shoreline resources (wetlands, beached, dunes and riparian buffer) in a report to the Governor and General Assembly of Virginia as mandated by Senate Joint Resolution 35 of the 2010 Assembly (CCRM, VIMS 2010). This recommendation was included in Living Shorelines, Shoreline Integration legislation adopted by Virginia 2011.

VII. INFORMATION ACQUISITION

Virginia has a breadth and depth of information about its wetlands, and yet much of the information is dated, or lacks details necessary to manage the resource properly. The most important information need is iterative landcover data that includes accurate, detailed elevation (such as LiDar). Landcover data is required for the on-going monitoring and assessment effort, to track status and trends and plan for integrated wetland restoration, preservation, and tidal wetland retreat in the face of sea level rise.

VIII. OUTREACH/ EDUCATION

Outreach and education on tidal and nontidal wetland issues in Virginia are undertaken by a broad range of entities from primary and secondary schools, to state agencies, Institutes of higher education and NGOs. Various agencies and non-profits have programs in place to educate the general, or regulated public. Others target specific audiences such as citizens of a certain geographic area, or those in positions of decision-making.

Citizen-comprised Local Wetland Boards play a critical role in tidal wetland permit decision-making. Two other citizen boards, the Virginia Marine Resources Commission and the State Water Control Board are responsible for oversight and regulatory decisions for wetlands. Training, publications, and technical advice directed toward citizen decision-makers help ensure better informed decisions. Educational efforts that are directed toward the general public regarding wetland management and ecosystem processes can minimize intended, or unintended adverse wetland impacts among wetland property owners and increase awareness of the importance of wetland resources.

Outreach efforts include on-going enhancements of DEQ's website to provide better, user-friendly knowledge to the general public regarding wetland management. DEQ staff provides educational presentations on topics such as an overview to wetlands, and regulatory and non-regulatory updates to various groups including schools, professional organizations, localities, and other entities as requested. Further, DEQ conducts presentations on WetCAT at both local environmental workshops and national conferences.

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Appendix A

Core Elements and Objectives Status

1. Monitoring and Assessment Objectives

Overall Goal: The proposed objectives are intended to strengthen the monitoring and assessment element through the generation of new data including identification of wetlands at risk for conversion from human activity or sea level rise, to promote integration into the overall water quality program and better informed decision-making.

Objective MA1: Maintain effort to re-calibrate wetland assessment models. The Virginia wetland assessment model hinges on an assumption about the stressors created by land development patterns. As agricultural practices and urban/suburban development practices evolve it is essential that the model relationship be regularly recalibrated. The target is re-calibration of each physiographic province (Ridge & Valley, Piedmont, and Coastal Plain) every 3 to 5 years.

Objective MA2: Update Monitoring and Assessment Strategy.

Objective MA3: Enhance tidal wetlands monitoring to assess and track the cumulative effects of wetland loss and adverse impacts due to development and climate change. Develop protocols to identify wetlands at risk for conversion due to sea level rise.

Objective MA4: Assess nature-based shoreline best management practices, living shorelines, for ecosystem services adverse and beneficial effects, for example oyster and mussel structures.

Objective MA5: Assess the efficacy of crowd-sourcing a wetland condition assessment program. Develop a protocol for citizens to report on relative “health” of assessed wetlands to inform selection and priorities for site visits.

Monitoring and Assessment Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod /Low)* for 2015-2020 WPP	Primary Responsible Entity
MA1	This effort was underway by DEQ and the Center for Coastal Resources Management (CCRM) - Virginia Institute of Marine Science (VIMS) and has been completed for the coastal plain (2014), the piedmont (2011) and the Ridge & Valley (2013). This activity is funding dependent and, at present, no funding has been appropriated for this activity. This is a highly critical activity and a high priority. CCRM is making efforts to maintain the model re-calibrations at present.	On-going	X	High	VIMS and DEQ
MA2	Completed and will be submitted to EPA in Winter 2016	X			DEQ
MA3	VIMS/CCRM conducts the Tidal Marsh Inventory. CCRM will develop a protocol to use the inventory in order to assess effects due to development and sea level rise. Inventories are on-going. Development of protocol to use the inventory data to assess the effects of development and sea level rise will depend upon funding.		X	High	VIMS and VMRC (Virginia Marine Resources Commission)
MA4	CCRM intends to investigate ecosystem services and trade-offs for various structural and non-structural approaches to living shorelines. CCRM will seek to assess the use of oyster structures as a component of living shorelines and the efficacy of the use of these structures. CCRM will seek to advance research on shellfish populations associated with living shorelines whether they are intentionally part of the plan design or volunteers. This effort is a priority for the 5 year planning cycle.		X	High	VIMS and VMRC
MA5	CCRM will investigate process and protocols for use of citizen science to inform wetland condition assessment. We have had preliminary conversations on the development and use of a mobile app and the need for and likely success of crowd-sourced data collection.		X	Moderate	VIMS

2. Regulation

Overall Goal: These objectives will provide the ability to make better permitting decisions relative to cumulative impacts, water quality improvement, tidal wetland sustainability, preservation of wetland functions, and compensatory mitigation tracking and effectiveness.

Objective R1: Geo-locate preserved wetlands and evaluate the completeness of DEQ wetland permit records for preserved wetlands.

Objective R2: Track unpermitted wetland impacts. DEQ worked with CMI to locate and quantify unpermitted wetland impacts. This activity built upon a previous pilot effort and developed new methods to identify wetland change analysis.

> See Final Report regarding Objective R1 and R2:
> http://www.deq.virginia.gov/Portals/0/DEQ/Water/WetlandsStreams/Final%20VADEQ%20Wetland%20Permit%20Compliance%20Report_2012.pdf and
> http://www.deq.virginia.gov/Portals/0/DEQ/Water/WetlandsStreams/Lidar_Report_Virgnia_Tech2012.pdf

Objective R3: Work with the VDOT to enhance the Wetland Dataviewer to accommodate VDOT permit review and NEPA documentation needs.

Objective R4: Mitigation bank tracking, evaluation and guidance.

Objective R5: Develop a VMRC general permit for living shorelines.

Objective R6: Continue to assess the effectiveness of tidal wetland management activities. Focus on the implementation of the Virginia policy on Living shorelines. See http://ccrm.vims.edu/publications/pubs/Permit_Fidelity_2012.pdf

Objective R7: Develop Integrated Guidance for Tidal Shorelines.

Objective R8: Access the Corps ORMS database for use in WetCAT. CCRM will coordinate with the Corps Norfolk district to acquire permit data and incorporate it into WetCAT.

Objective R9: Tie in outcomes of living shorelines NPS load reduction study to regulatory process.

Objective R10: Develop the capacity to produce a report from WetCAT for use by DEQ and VDOT.

Objective R11: Expand data collection capabilities of DEQ staff during site visits.

Objective R12: Assess barriers to use of dredge material to address wetland vulnerability.

Regulation Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod/ Low)* for 2015-2020 WPP	Primary Responsible Entity
R1	DEQ subcontracted CMI at Virginia Tech to complete a study in 2011 that verified the accuracy and completeness of wetland preservations recorded in DEQ's CEDS database. Additionally, where possible, CMI provided DEQ spatial delineations or locations of wetland preservations in a database form. CMI compared original wetlands permits to the CEDS database, and created a GIS database of visually interpreted wetlands preserved through the permit process.	X - 2011			DEQ
R2	While preliminary, results of the LIDAR study were clearly promising. It was determined that LIDAR has the potential to capture finer changes within wetlands that would otherwise escape detection using other remote sensing or imaging methods.	X - 2011			DEQ
R3	Modifications to WetCAT to allow VDOT and other entities to analyze cumulative impacts associated with linear projects.	X - 2014			DEQ and VIMS
R4	CCRM will continue to enhance WetCAT and build on previously funded and completed efforts to enhance use of WetCAT for mitigation targeting with an emphasis on TMDLs and water quality.	X - 2013	Ongoing	Moderate	VIMS and DEQ

R5	Mandated by SB964, VMRC is tasked with the development of this permit. Background research and modeling efforts are underway by CCRM. CCRM -VIMS initiated the development of draft criteria for the permit. The process engaged VIMS scientists, VMRC and Corps of Engineers representatives. The draft criteria were delivered to VMRC Fall 2011. VMRC briefed all Wetlands Boards on the legislation and VIMS staffed attended the briefings. VMRC initiated a two committee process to develop the general permit, a technical committee and an advisory committee. After several meetings separately, the committees were merged in 2014. The first of two general permits has been approved and is effective September 1, 2015. This effort will require cooperative participation of wetland permitting authorizes and advisory agencies.	Began Summer 2011	X	High	VIMS and VMRC
R6	Build upon the findings of the original assessment to modify VIMS guidance. Track decision-making to assess implementation of living shorelines policies and general permit.		X	**High**	VIMS and VMRC
R7	With mounting scientific evidence as to the loss of tidal wetlands and limits on wetland resilience in the face of sea level rise, development and promulgation of guidance to simplify and codify the State's preferences for shoreline management is a high priority. The Virginia Marine Resources Commission has made little progress on this mandated task. This effort requires consideration and incorporation of regulatory programs falling under several different agencies, notably VMRC, the Department of Environmental Quality, and Local Wetland Boards. CCRM/VIMS has done some work in development of updates guidelines for the Tidal Wetlands Act and Beaches and Dunes which could be incorporated into an integrated guidance document.		X	**High**	VMRC and VIMS
R8	This remains a priority to assure that wetlands gains and losses are accurately tracked and reported. *An EPA grant proposal was submitted in 2014 to address this objective but was not funded. This remains a priority to assure that wetlands gains and losses are accurately tracked and reported.*	Not Funded	X	**High**	DEQ and VIMS

R9	Use findings from study to modify and/or develop policy on the options for incorporation of living shorelines for local and State TMDL implementation. The results of the study are just becoming available. Seeking opportunities to assess the efficacy of integrating findings into water programs.		X	**Moderate**	VMRC and VIMS
R10	Produce a summary report for wetland condition results for use by VDOT and DEQ to assess preliminary impacts/conditions for NEPA reviews. Develop and test a prototype report for project assessment and permit review. Development and production of reports directly from WetCAT to DEQ and VDOT pending funding support.		X	**High**	VIMS
R11	This objective is intended to maximize data collection capabilities of field personnel. Tablets have been distributed to DEQ monitoring staff and training conducted. DEQ staff have been uploading information and continuation of data collection. Develop and implement procedures to automate and modernize biological data collection to advance integration of stream water quality monitoring and wetlands monitoring for beneficial uses and water quality standards. These actions will cross-walk with the Water Quality Standards for Wetlands Core Element. Options are being explored and discussed.		X	**High**	DEQ and VIMS
R12	The VMRC has expressed interest in better understanding of the science of beneficial use of dredge material and the policy context guiding decisions on projects. Regulatory guidance and permitting requirements can limit the use of dredge material for vegetated and non-vegetated wetland projects. The Virginia Marine Resources Commission has expressed interest in better understanding of the science of beneficial use of dredge material and the policy context guiding decisions on projects. CCRM will propose a study to develop a geo-spatial tool and assessment of the legal context for beneficial use of dredge material.		X	**Moderate**	VMRC and VIMS

3. Voluntary Restoration

Overall Goal: Identify and track voluntary non-regulated restoration actions that can count toward the attainment of a net resource gain.

Objective VR1: Develop and implement a voluntary wetland restoration tracking system.

Objective VR2: Develop a multi-criteria targeting tool for wetland restoration using an integrated perspective (ie load reduction benefits, coastal resiliency, etc).

Objective VR3: Develop and institute a process for integrated wetland status and trends tracking including regulatory and non-regulatory gains and losses. Establish a protocol for data acquisition, compilation and reporting.

Voluntary Restoration Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod/Low)* for 2015-2020 WPP	Primary Responsible Entity
VR1	The development of a geo-referenced database combined with an accounting system for tracking credits would enable a complete understanding of the status of voluntary wetland restoration efforts. CCRM has submitted 3 proposals to the National Oceanic & Atmospheric Administration (NOAA) - Coastal Program to perform this activity. This proposal was not funded. Completion of objective will be dependent upon resolution of private property owner confidentiality issues.	Not started due to lack of funding	X	High	VIMS
VR2	There are ecosystem processes common to site suitability for both wetlands restoration and compensatory mitigation. CCRM will seek to maximize the integration of these two processes into decision-making tools developed to address either regulatory or non-regulatory wetlands projects.		X	High	VIMS and DEQ

VR3	Need this data for reporting progress on 2014 Bay Agreement goals. Previous efforts to report of the status and trends of Virginia's wetland have been problematic. DEQ has an effective regulatory permitting database process in place to track impact amounts of non-tidal wetlands and a new process has been initiated by VMRC to track tidal impacts. However, tracking efforts for voluntary restoration, natural losses and unpermitted losses are non-existent or hugely inaccurate. In order to accomplish this effort, Objectives VR1 and R5 would need to be completed. Completion of Objective VR3 would depend on the successful accomplishments of Objectives VR1 and R5 as these objectives are the building blocks to begin the process for integrating wetland status and trends efforts.		X	High	VIMS, DEQ and VMRC

4. Water Quality Standards for Wetlands

Overall Goal: Improve the quality of wetlands by gathering and analyzing monitoring data and other information to serve as the basis for water quality standards updates.

Objective WQ1: Begin a process to assess the relationship between non-tidal wetlands in the watershed and ambient water quality. CCRM has started a project to look at the role of wetlands in the watershed relative to water quality, particularly water quality impairment.

Objective WQ2: Track and assess stormwater impacts on wetlands. Develop a protocol for tracking long term effects on existing jurisdictional wetlands and jurisdictional wetlands created incidentally via the DEQ Stormwater Local Assistance Fund process.

Objective WQ3: Develop capacity within WetCAT to target wetland restoration for TMDL implementation.

Water Quality Standards Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod/Low)* for 2015-2020 WPP	Primary Responsible Entity
WQ1	CCRM has begun compiling various existing data sets to do this assessment. Prototype underway.		X	High	VIMS
WQ2	At this time, it is too preliminary to determine tracking and assessment needs that are necessary until the Chesapeake Bay Agreement for BMPS has been completed.		X	Moderate	VIMS and DEQ
WQ3	CCRM will seek funding to develop a wetland restoration targeting tool for wetlands as Best Management Practices and beneficial landuse conversion. This effort would be coordinated with targeting for all ecosystem services. (see Objective VR2).		X	High	VIMS and DEQ

5. Planning and Sustainability

Overall Goal: To plan for the persistence of tidal and non-tidal wetland ecosystem functions in the face of climate change and development pr4essures, to promote the use of living shorelines, and plan for tidal wetland resilience including managed retreat in the face of sea level rise.

Objective PS1: Continue to develop community-scale comprehensive coastal resource management portals (CCRMP). http://ccrm.vims.edu/ccrmp/hampton/

Objective PS2: Establish and maintain a process for improved communication among state, federal, local non-governmental and governmental partners managing or working in wetlands. CCRM/ VIMS will establish a contact list for all parties, initiate a list-serve communication capability and strategy, and develop a web-based information clearinghouse.

Objective PS3: Assess climate-induced changes to tidal and non-tidal wetlands with an emphasis on headwater wetlands and connectivity to downstream wetland systems.

Objective PS4: Develop atlas of natural shoreline features to identify opportunities for beneficial use of dredge material to address wetland vulnerability.

Objective PS5: Enhance the existing shoreline management model which identifies preferred management options to maximize ecosystem services of management actions. CCRM will investigate opportunities to improve models to address limitations of the current model construct. CCRM will seek opportunity to develop end-user models. Model can be viewed here: http://cmap.vims.edu/CCRMP/HamptonCCRMP/Hampton_CCRMP.html

Planning and Sustainability Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod/Low)* for 2015-2020 WPP	Primary Responsible Entity
PS1	(NOTE: CCRM has changed the names of the comprehensive guidance effort from "plan" to "portal" to signify the access of the information via the web). The guidance provided through the web-based portals should be specifically designed to support integrated management of current tidal shoreline resources addressing shoreline erosion requirements for local comprehensive plans, and should also provide information to support local planning efforts to promote community resilience and adapt to changing conditions in the coastal zone. CCRM has completed eighteen portals and will continue to develop these portals for each locality in Tidewater Virginia. A schedule projects completion of 15-20 new portals for the next 5 years.	On-going	X	High	VIMS
PS2	Virginia has multiple parties engaged in wetlands preservation and management, including state (including North Carolina via VIMS engagement in APNEP), federal (USACE), and local agencies, as well as numerous local, state, and regional nongovernment organizations (NGOs). The lack of an effective method of consistently sharing information among these groups has been problematic in obtaining common goals because of funding sources, individual agency goals and agency resources.		X	**High**	VIMS, DEQ, and VMRC
PS3	CCRM/ VIMS has received an multi-year award (CD-96329601) from the EPA to begin the assessment on the York River system.		X	**High** Underway: 2014-2017	VIMS

PS4	Develop an on-line map viewer that incorporates information on natural coastal features, landuse, land ownership, wetland status, navigational channels and working waterfronts, to identify potential wetland sites for dredge material application to promote wetland resilience.		X	**Moderate**	VIMS
PS5	The CCRMP includes a GIS analytical model which identifies the preferred shoreline management options for shorelines within each locality. Model refinement is needed to address unique geomorphological features to ensure the model output is consistent with the management preferences. Develop end-user real time decision tools to identify preferred management approaches. The Shoreline Best Management Practices		X	**High**	VIMS and VMRC

6. Information Acquisition

Overall Goal: To provide accurate and timely data for continued enhancement of the wetland dataviewer (WetCAT) and other GIS-based wetland tools.

Objective IA1: Obtain iterative landcover data set. This effort is critical to a comprehensive picture of Virginia's wetlands with regard to human and/or natural losses of wetland acreage and ecosystem services.

Information Acquisition Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod/Low)* for 2015-2020 WPP	Primary Responsible Entity
IA1	Required for data development and ongoing analysis of WetCAT over time. DEQ's Water Quality Program is currently conducting orthophotography of the entire Commonwealth of Virginia throughout the year through funding from NOAA. This data will be imported into WetCAT once completed.	On-going	X	High	VIMS and DEQ

7. Outreach/Education

Overall Goal: Develop and deliver outreach materials, presentations and training to decision makers and the general public. Enable better informed decision-making and increase awareness of wetland management programs and permit compliance.

Objective O/E1: Improve public communications print materials. See http://www.deq.virginia.gov/portals/0/deq/water/wetlandsstreams/publicguiderevised2012.pdf

Objective O/E2: Maintain and update DEQ Wetlands website to incorporate new reports, data and programs. See http://www.deq.virginia.gov/Programs/Water/WetlandsStreams.aspx and http://www.deq.virginia.gov/Portals/0/DEQ/Water/WetlandsStreams/WetlandsStatusandTrendsReport-Dec2013.pdf

Objective O/E3: Maintain outreach for local government decision-makers.
See: http://events.r20.constantcontact.com/register/event?oeidk=a07eadresat9a39b2f7&llr=5knx77cab and http://ccrm.vims.edu/publications/pubs/rivers&coast/RC914.pdf

Objective O/E4: Develop and apply a protocol to assess use of CCRMP guidance by coastal managers and target and enhance efforts to ensure effective use. Some elements of this process will begin Oct 2015 with grant funding from NOAA.

Outreach/Education Objectives Status

OBJ	Action/Rationale	Completed from WPP 2010-2015	To Be Completed in WPP 2015-2020	Priority Status *(High/Mod/Low)* for 2015-2020 WPP	Primary Responsible Entity
O/E1	DEQ updated and expanded the Public Guide to the Wetland Permitting Process in Virginia. Completed September 2012.	X -2012			DEQ
O/E2	Modify existing website content to keep current as reports, data, and outreach materials are updated.		X	**High**	DEQ
O/E3	Continue effort to provide presentations to explain the use of WetCAT to localities for their comprehensive landuse planning. CCRM conducts an annual workshop for Wetland Board Members. Additionally, each local government for which a CCRMP had been completed has gotten targeted training on the elements within the portal. This targeted education effort has been developed, in part, as a response to the need for additional training as identified through the Regulatory Fidelity Study. CCRM also produces a annual newsletter and quarterly e-news. DEQ has presented WetCAT at several local and national workshops.		X	**High**	DEQ and VIMS
O/E4	Develop a set of metrics and process to determine if and how CCRMP guidance is used by decision makers.		X	**High**	VMRC and VIMS

Appendix B

Acronyms

Department of Environmental Quality (DEQ)

Center for Coastal Resources Management, (CCRM)

Chesapeake Bay Local Assistance (CBLA)

comprehensive coastal resource management portals (CCRMP)

Comprehensive Environmental Database System (CEDS)

Conservation Management Institute (CMI)

Department of Conservation and Recreation (DCR)

Environmental Protection Agency (EPA)

Non-government organizations (NGOs)

Resource Protection Areas (RPAs)

U.S. Army Corps of Engineers (Corps)

Virginia Institute of Marine Science (VIMS)

Virginia Marine Resources Commission (VMRC)

Virginia Water Protection Permit Program (VWPP)

Wetland Program Plan (WPP)

Appendix C

State Programs

Department of Game and Inland Fisheries

The Virginia wildlife action plan unites natural resource agencies and citizens through a common vision and concept for the conservation of the Commonwealth's wildlife and the habitats in which they live. The following table is a portion of Table 10.1 from the wildlife action plan that includes any actions to occur in wetlands. These actions are ranked by priority and indicate habitat and species affected as well as action category.

Virginia Department of Game and Inland Fisheries. 2005. Virginia's comprehensive wildlife conservation strategy. Virginia Department of Game and Inland Fisheries, Richmond, Virginia. **http://www.bewildvirginia.org/wildlifeplan/**

Department of Conservation and Recreation, Division of Natural Heritage

The DCR-DNH has developed the Virginia Natural Landscape Assessment (VaNLA), a conservation planning tool that uses wetland-related attributes to *identify* and then *prioritize* areas that should be conserved to maintain an intact functioning network of natural habitats/lands on the landscape. This model *identifies* a network of natural lands (i.e. not only forests but expanses of intact natural lands including wetlands) as habitat cores and interconnecting corridors. The network of cores and corridors are then *prioritized* with an Ecological Integrity Score; every core over 100 interior acres is ranked from 1 – Outstanding Ecological Integrity to 5 – General Ecological integrity. The process for incorporating wetlands into the model and for setting priorities is described below.

A. Identification of core areas: Two of the inputs used to identify intact cores for the VaNLA are wetland-related.

1. **UMNWIAcres:** This field contains the acreage of unmodified wetlands per VANLA Core or Habitat Fragment (an intact natural area from 10 to 99 acres in size). Unmodified wetlands are based on National Wetlands Inventory data from which farmed, diked, ditched, and otherwise modified wetlands were removed. Beaver impoundments, which are a natural form of modification, were left in the unmodified wetlands layer.

2. **UMNWIPERC:** This field contains the percent area of unmodified wetlands per VANLA Core or Habitat Fragment. Unmodified wetlands are based on National Wetlands Inventory data from which farmed, diked, ditched, and otherwise modified wetlands were removed. Beaver impoundments, which are a natural form of modification, were left in the unmodified wetlands layer.

These attributes are used to identify cores to be ranked based on ecological integrity, and these attributes are maintained in the final product, to allow subsequent analyses of cores based on these wetland parameters.

B. Prioritization of cores: Each and all cores in the VaNLA were analyzed based on 9 input variables to get at biological diversity, and one of these was the variety of unmodified wetlands within each core.

> **1.UMNWIVAR:** This field contains the variety of unmodified wetlands per VaNLA Core or Habitat Fragment. Unmodified wetlands are based on National Wetlands Inventory data from which farmed, diked, ditched, and otherwise modified wetlands were removed. Beaver impoundments, which are a natural form of modification, were left in the unmodified wetlands layer.

The Virginia Coastal Zone Management Program (VCZMP)

Virginia's coastal zone encompasses the 29 counties, 17 cities and 42 incorporated towns in Tidewater Virginia and all of the waters therein, and out to the three-mile Territorial Sea boundary. The coastal zone includes Virginia's entire Atlantic coast watershed as well as parts of the Chesapeake Bay and Albemarle-Pamlico Sound watersheds. The Virginia CZM Program is part of a national coastal zone management program, a voluntary partnership between the federal government and the U.S. coastal states and territories authorized by the Coastal Zone Management Act of 1972. The Virginia CZM Program was established in 1986 and is reauthorized every four years by an executive order signed by Virginia's incoming governor. This executive order directs state agencies to carry out their legally established duties consistent with this Program and its ten goals. It also designates the Department of Environmental Quality as the lead agency for the networked program and outlines a conflict resolution process should any state actions be deemed inconsistent with the Program.

The VCZMP completed a Coastal Needs Assessment in 2015. It is a planning initiative to direct efforts for the next five years through a number of specific strategies, funded under Section 309 of the federal Coastal Zone Management Act. One of the strategies developed through that process targeted shoreline management. The strategy focused on promoting living shorelines. Over a five year period the strategy provided $750,000 for the following completed initiatives:

- A "Living Shoreline Summit" with peer reviewed proceedings, to advance the use of this management technique (held December, 2006)
- Revised "Wetlands Guidelines" to be used by the Virginia Marine Resources Commission, the Virginia Institute of Marine Science, local wetlands boards and others to guide decisions about shoreline and tidal wetlands management (Drafted by VIMS and submitted to VMRC for consideration)
- Improved data on shoreline conditions to support more informed shoreline management decisions.

- Research to document the habitat value and viability of living shorelines and to improve their design (two research projects on “Better Sill Design” completed by VIMS)
- Guidance for local governments to use in shoreline management planning
- Outreach materials for land use decision-makers, landowners and contractors on living shoreline advantages and design principles
- A training program for contractors and local government staff on living shoreline practices
- A report on improving management of Virginia's dune and beach resources, including proposed revisions to the Coastal Primary Sand Dunes and Beaches Act
- Changes to the Coastal Primary Sand Dunes and Beaches Act by the Virginia General Assembly (Adopted 2008 – expanded Act from 9 localities to the entire coastal zone)
- Revisions to the Coastal Primary Sand Dunes and Beaches Guidelines. (Drafted by VIMS and submitted to VMRC for consideration)
- A comparative analysis of two methodologies for developing local shoreline management plans.

Appendix D

Stressors list used for Monitoring and Assessment Program

Sediment Deposits
Eroding Banks
Active Construction
Other sedimentation
Potential Source Discharge
Potential Non-Point Source Discharge
Other hydrologic alterations
Active Agriculture
Unfenced Cattle
Active Timber Harvesting (within 1 yr)
Active Clear Cutting (within 1 yr)
Other toxic inputs
Drain/Ditch
Filling/Grading
Dredging/Excavation
Stormwater inputs/culverts/input ditches
>= 4 lane paved road
2 lane paved road
1 lane paved road
Gravel
Dirt
Railroad
Other roadways (parking lots)
Utility easement maintenance
Herbicide application
Dike/Weir/Dam
Beaver Dam
Mowing
Brush cutting
Excessive herbivory
Timber harvesting (1-5yrs)
Clear cutting (1-5 yrs)
Invasive species present
Other vegetative alteration