Study of Tidal Shoreline Management in Virginia

Recommendations for living shorelines and tidal resources sustainability

Report to the Governor and Virginia General Assembly

in Response to

Senate Joint Resolution No. 35

Submitted By
Center for Coastal Resources Management
Virginia Institute of Marine Science
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Preface

The Virginia Institute of Marine Science (VIMS) was directed under Senate Joint Resolution 35, to conduct a study of tidal shoreline management in Virginia. The resolution directed four specific tasks to be included in the study: "(i) review tidal shoreline management in the Commonwealth and similarly situated states; (ii) identify potential changes to the regulatory structure of tidal shoreline management to reduce the cost and time required to issue a permit; (iii) identify regulatory innovations that would increase adoption of living shorelines among shoreline landowners; and (iv) make specific recommendations to achieve the sustained protection of tidal shoreline resources."

The Center for Coastal Resources Management at VIMS was delegated the responsibility for the study. We conducted detailed reviews of the shoreline management construct of Virginia along with three states: Massachusetts (is similar to Virginia with private property ownership to low water) and neighboring North Carolina and Maryland, and a less detailed review of other coastal states. The review was to assess models for use in Virginia that address multi-jurisdictional decision-making or living shorelines or both and at the same time, look for possible complications or ineffective programmatic efforts to avoid. The review enabled the identification of possible options for time and costs savings for permit issuance and supported the identification of regulatory innovations to increase the use of living shorelines. A look at the current shoreline management structure in Virginia and the future cast of adverse resource effects due to management decisions and natural losses calls for a comprehensive approach to achieve sustainability of shoreline resources.

We would like to acknowledge Joan Salvati and Shawn Smith, DCR, Division of Chesapeake Bay Local Assistance, and Tony Watkinson and Robert Neikirk, Virginia Marine Resources Commission for assistance with this report. We also thank the local government staff that provided information on shoreline decision processes. The Center for Coastal Resources Management at the Virginia Institute of Marine Science is responsible for the content of this report and it does not reflect the formal position of any other individuals or agencies.

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Executive Summary

Virginia now confronts the challenge of enhancing its existing tidal shoreline management programs to make them more efficient and effective. The programs have developed effective protocols for dealing with their individual purviews, but two issues have emerged: the diversity of programs has become confusing for the regulated community; and the environmental outcomes have not been optimal. This report summarizes a review of these issues and presents several recommendations for program enhancements that specifically focus on making Virginia's tidal shoreline management more efficient and more effective.

The perception is that the common goals of the various regulatory programs might be more effectively promoted across the Commonwealth if there were greater uniformity in procedures and more substantive integration of guidance for the individual programs.

Opportunities to reduce cost and time associated with shoreline management programs lie mostly in providing a more predictable, transparent process. Improved coordination among management agencies can achieve time and cost saving while at the same time improving the integration of the decisions. Savings can also be promoted by addressing gaps and over-laps in the collection of program regulation and guidance that impact permitting decisions.

There are many financial incentive options to promote living shorelines that could be successful in Virginia. However, many of the options functionally reduce fees or revenues which often help off-set the cost of regulatory permit programs. These options would potentially create a fiscal issue for agencies. Permit relief in the form of exemptions, general permits, or permit preference seems to be a viable option which if properly crafted, offers time and cost savings to property owners and permitting authorities. Depending upon the form that such relief might take, regulatory or legislative action is probably necessary.

Virginia does not have an official position on the use of living shorelines for erosion protection. A statement of policy that identifies a preference for the use of existing or enhanced natural shoreline habitats for erosion protection would provide recognition that living shoreline designs are a desirable approach for many of the Commonwealth's tidal areas.

Recommendations

1. Virginia should develop integrated guidance for management of tidal shoreline systems. The guidance should identify preferred shoreline management approaches for the shoreline types found in Virginia. The intent should be for all regulatory authorities with purview over activities along Virginia's tidal shorelines to use the guidance to achieve greater collective efficiency and effectiveness in management of the Commonwealth's resources. Development of the guidance should be a cooperative effort involving the Department of Conversation and Recreation, the Virginia Marine Resources Commission, and the Virginia Institute of Marine Science.

2. Virginia should conduct a study to identify and assess any potential regulatory issues associated with development and implementation of integrated guidance for tidal shoreline management should be conducted.

3. Virginia should officially identify a preference for living shoreline designs as a management strategy for tidal shoreline systems. The policy could be articulated in the form of legislation, executive order, or regulation. However, a regulatory preference promulgated by one agency does not guarantee the same for other management entities. This might, therefore, fall short of establishing a unifying focus for regulatory programs that could improve efficiency and effectiveness of the Commonwealth's shoreline management efforts. For this reason, a legislative or executive action would be preferable.

4. Virginia should develop and implement a general permit for living shorelines. The permit development process should involve the Department of Conversation and Recreation, the Virginia Marine Resources Commission, and the Virginia Institute of Marine Science, with technical assistance from other shoreline management entities as necessary. The process should be coordinated with the U.S. Army Corps of Engineers to avoid conflicts with their permitting requirements.

5. Virginia should advance the efforts currently underway at VIMS to develop and promulgate comprehensive coastal resource management plans for all Tidewater localities. The plans should be specifically designed to support integrated management of current tidal shoreline resources, and should also provide information to support local planning efforts to adapt to changing conditions in the coastal zone, including sea level rise.

6. Virginia should promote the education of both public officials and the general public regarding the need for integrated shoreline management. Success in managing the risks to both human and natural resources will require both regulators and the regulated community to understand the issues and adjust expectations for what is possible and what is appropriate along Virginia's shorelines.

Tidal Shoreline Management in Virginia

Introduction

Virginia first passed legislation to protect tidal shoreline resources in 1972. The Tidal Wetlands Act specifically focused on tidal marshes which were understood to provide a variety of valuable services in coastal ecosystems. Since that time, amendments to the Tidal Wetlands Act (TWA), the Coastal Primary Sand Dune and Beaches Act, Subaqueous Lands permitting and the Chesapeake Bay Preservation Act have been used to provide regulatory oversight to all portions of shoreline systems from the uplands to the adjacent shallow waters. All of these changes have been in response to the growing understanding of the importance of natural shoreline systems for maintenance of water quality and support of aquatic life.

In their natural condition, tidal shoreline systems play an important role in the ecology of the entire coastal ecosystem. Tidal shoreline systems include the upland area immediately along the shoreline (riparian area), the intertidal area (marshes and beaches that extend from the riparian area to the low water mark), and the nearshore subaqueous lands (shallow aquatic environment adjacent to the shore). In combination these elements of tidal shorelines can affect water quality by taking up and sequestering nutrients, sediments and pollutants carried in runoff and groundwater from the uplands. They are also important as habitat for a wide variety of plants and animals, providing food and cover for many organisms at critical stages of their life cycle. Naturally vegetated shoreline systems are effective at controlling erosion and buffering uplands from storm damage. In their natural state these systems have a capacity to respond to changes in the environment, such as sea level rise, while maintaining many of the functions that make them valuable to society.

The Current Issues

The regulatory programs Virginia has enacted for management of shoreline systems are all focused on sustaining the capacity of the systems to perform the many valuable functions that have been identified. However, because the understanding of these systems has evolved in steps, the regulatory structure Virginia uses has also been developed in steps. The result is an assemblage of programs with individual, but overlapping interests, and approaches that are not always effectively coordinated. The consequences of this regulatory framework have not always been desirable. Despite careful development and implementation by the responsible agencies at state and local levels, the permitting process is not always easily understood by the regulated community, and the environmental outcomes from multiple review and decision processes have not always been optimal.

Despite the regulatory attention to protection of shoreline resources, Virginia continues to lose tidal wetlands, beaches and natural riparian vegetation. Impacts arise as a result of both human and natural causes.

While erosion and sea level rise are responsible for some of the losses, the most dramatic changes have resulted from human activities. With the expansion of regulatory coverage over the past several decades, most of these impacts have resulted from activities that were permitted. Some of these impacts have been approved after a finding that the benefits outweigh the detriments. Other impacts have been a result of regulatory conundrums created when overlapping programs do not have coordinated visions of the best strategy for managing a shoreline element.

Filling, clearing, and armoring shorelines for many different reasons have resulted in cumulative impacts to riparian areas and 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 about 42 acres (Duhring 2004). Similarly, the current trend for riparian vegetation is toward loss of natural cover to development.

The cumulative losses of tidal wetlands and riparian vegetation 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).

Virginia now confronts the challenge of enhancing its existing tidal shoreline management programs to make them more efficient and effective. The programs have developed effective protocols for dealing with their individual purviews, but two issues have emerged: the diversity of programs has become confusing for the regulated community; and the environmental outcomes have not been optimal. This report summarizes a review of these issues and presents several recommendations for program enhancements that specifically focus on making Virginia's tidal shoreline management more efficient and more effective.

Review of Virginia's Shoreline Management Construct

Virginia is one of several states that manage shoreline resources with a variety of regulatory authorities implemented at multiple levels of government.

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 Virginia Marine Resources Commission (VMRC) with the

option for Tidewater localities to assume the primary 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 was 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 the erosion; absorption of silt and pollutants; and provision of recreational and aesthetic opportunities. Currently, the ordinance is administered by 34 counties and cities, and 2 towns. Twelve Tidewater localities have not adopted the ordinance and the Virginia Marine Resources Commission (VMRC) acts as the permitting authority for those locales.

Marine Resources Commission administers a permit program designed to regulate encroachments in, on, under or over the State-owned submerged lands. These lands, also known as subaqueous lands, are those lands channelward of mean low water, lying under tidal waters and those lands below ordinary high water on non-tidal waterways not held privately by grant. The permit program, as established by the General Assembly, requires that the Commission shall be guided by the provisions of Article XI, Section 1 of the Constitution of Virginia and the Public Trust Doctrine. The Commission is directed to also consider economic and ecological effects on marine and fisheries resources of the Commonwealth, tidal wetlands, adjacent and nearby properties, water quality and submerged aquatic vegetation. This authority is implemented through a regulatory program that requires permits for activities impacting subaqueous lands. The VMRC conducts public interest reviews for proposed projects and makes the permitting decisions.

Operating under the same state-local program model as the Tidal Wetlands Act, the Coastal Primary Sand Dune Act was passed in 1980 (Va. Code §28.2-1400 et seq.). Eight localities were included in the 1980 Act: the Counties of Accomack, Northampton, Mathews, Lancaster, and Northumberland; and the Cities of Virginia Beach, Norfolk, and Hampton. According to the legislation, sand dunes and beaches provide valuable functions: they serve as protective barriers from flooding and erosion; provide an essential source of natural sand; provide important habitat for coastal fauna; and enhance the scenic and recreational attractiveness of Virginia's coastal area. The reach of the Act was significantly modified during the 2008 Session of the General Assembly. The list of local governments authorized to administer the Act was expanded to include all of Tidewater Virginia as defined in § 28.2-100 of the Virginia Code. Currently, 16 localities administer the Act, with VMRC acting as the permitting authority for beach and dune projects in the remaining jurisdictions.

In 1988, the Chesapeake Bay Preservation Act was passed (Va. Code §10.1-2100 thru 10.1-2116). The law covers all Tidewater localities, and provides an option for all other localities in the Commonwealth to adopt the program as well. The purpose of the Act is to "protect and improve the water quality of the Chesapeake Bay, its tributaries, and other state waters by minimizing the effects of human activity upon these waters….". 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 Resource Protection Areas (RPAs). RPAs include tidal wetlands, tidal shores and a 100-foot buffer protecting those features. Importantly, shoreline erosion structures are a permitted activity within the RPA, provided the design of the structure(s) is based on the best technical advice. The

comprehensive plan provisions of the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations) further require local governments to establish and maintain an information base from which policy choices are made about future land use and development that will protect the quality of state waters. Among the required information are shoreline and stream bank erosion problems. Consistent with the above provisions, many tidewater local governments currently have local policies on shoreline erosion issues. As another state-local program, the Department of Conservation and Recreation provides technical assistance to localities and performs local program reviews to ensure compliance with Bay Act requirements.

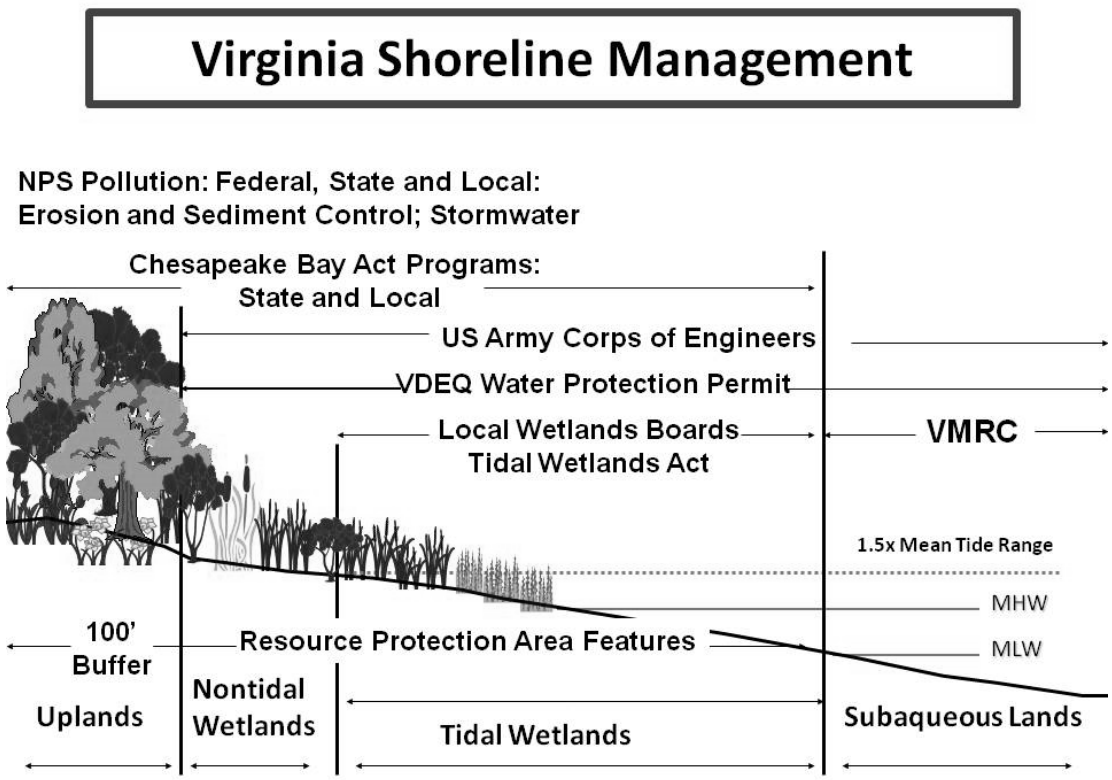

Figure 1. Schematic of Management Authorities along Virginia Tidal Shoreline.

The landscape of authorities that direct development along the shoreline in Virginia is not limited to the Tidal Wetlands Act, Coastal Primary Sand Dune and Beaches Act, Chesapeake Bay Preservation Act and Subaqueous lands management. A more complete view of the potential authorities making decisions regarding tidal shorelines is shown in Figure 1. Pragmatically, very few projects require detailed reviews from all of these entities. In some cases, a permit issued by one authority triggers a no-permit necessary finding or expedited permit issuance from another. Nevertheless any project may be reviewed by all. All these programs share a common general goal of maintenance or improvement of the environmental condition along Virginia's shores and adjacent waters.

Missing from this Figure are the state and federal agencies that play a role in advising the regulatory authorities. These entities include: the Virginia Institute of Marine Science with a mandate for general advisory service and specific responsibilities under the Tidal Wetlands Act: the Virginia Department of Game and Inland Fisheries: Virginia's Department of Historic Resources; the federal National Resources Conservation Service; the U.S. Fish and Wildlife Service; and the National Marine Fisheries Service.

Many of these shoreline permit/review processes are state-local programs administered at the local level. As a result, much of the decision-making responsibility falls to local governments (See Figure 2).

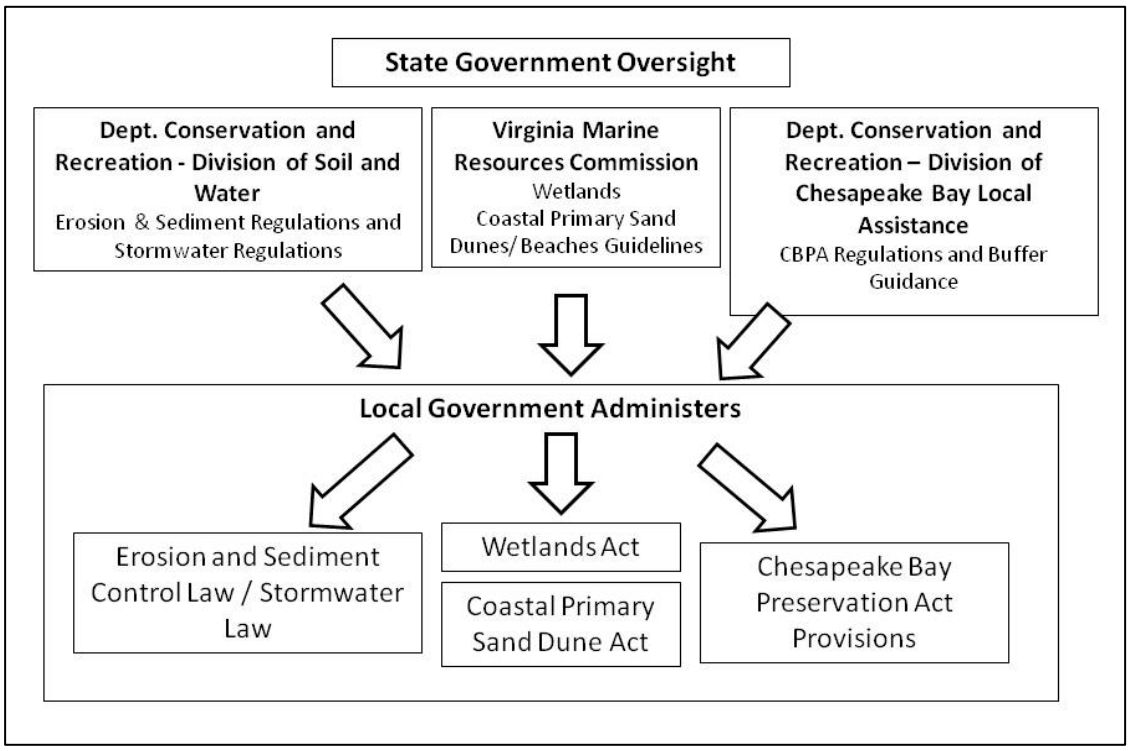

Figure 2. State- Local Shoreline Management interface

Regulations and guidance for each individual program are promulgated by responsible state agency. Much of this guidance is intended to direct processes and provide criteria for decision-making by local governments. Almost all of the guidance is narrowly focused and program specific, with little specific reference to coordination with other programs. There is a perception by decision-makers, shoreline contractors and the general public, that the guidance, when considered in the whole, has gaps, overlaps, and can even be interpreted to have elements that are at cross-purposes to each other.

The lack of integration in guidance for the various programs can and does result in inconsistent decision outcomes within and among localities. This variable outcome is also a result of the diversity of strategies local governments use to implement the multiple programs. Variation among localities is found in:

- The order in which permits or reviews occur. Some localities will routinely hear applications for wetland permits before considering the related CBPA permits for the same project. Others reverse the process, and some have no set protocol for sequencing considerations.
- The composition of the hearing authority for individual programs. All local Wetlands Boards must be either 5 or 7 member citizen boards, but some localities use the Wetlands Board as the local CBPA authority as well. Others have entirely different boards constituted for that purpose. Others make CBPA decisions administratively, with county staff handling the review and permitting decisions (figure 3).
- The source and extent of the local program support staff. There is great diversity in the ability of localities to staff the operations of local programs. Some localities have no dedicated staff, with wetlands and CBPA programs simply two of many assignments for a single individual. Others have a dedicated staff member for each program, but in some cases they are part of the same local government department and in others they come from entirely separate departments. The variation in staffing is most distinct between urban and rural localities. Rural localities typically have far fewer resources to dedicate to shoreline management programs even when the activity level is comparatively high (figure 4).

Local Government	Established a Separate CBPA Board	Wetland and Chesapeake Bay Board Members	Who makes Chesapeake Bay Act decisions
Accomack	No	Different	Administration and Board of Zoning Appeals
Chesapeake	Yes	Same	Administration and CBPA Board
Gloucester	Yes	Same	CBPA Board
Hampton	Yes	Different	Zoning Administrator and Chesapeake Bay Review Committee (staff and one citizen)
Isle of Wight	No	Different	Planning Commission and Board of Supervisors
JCC	Yes	Same	Administration and CBPA Board
Lancaster	No	Different	Administration and Board of Supervisors
Mathews	Yes	Different	Administration and Board of Zoning Appeals
New Kent		Same	Administration and C BPA Board
Newport News	Yes	Different	Administration and Board of Zoning Appeals
Norfolk	Yes	Different	Administration and Board of Zoning Appeals
Northampton	Yes	Different	Administration and Board of Zoning Appeals
Poquoson	Yes	Different	Environmental Development Plan Review Committee (EDPRC) (staff and citizen Board and BZA
Westmoreland	Yes	Different	Planning Commission
York	Yes	Different	Administration and CBPA Board

Figure 3. Table of Wetlands Board and Chesapeake Bay Board membership

Local Government	Chesapeake Bay Act Staff Department	Wetlands Board Staff Department	Same staff person(s) for both
Accomack	Planning	Building and Zoning	No
Chesapeake	Planning	Development and Permits, Zoning	No
Gloucester	Environmental Programs, Codes Compliance	Environmental Programs, Codes Compliance	Yes
Hampton	Codes Compliance, Public Works, Planning	Codes Compliance	No
Isle of Wight	Planning and Zoning	Planning and Zoning	Yes
James City County	Development Management, Environmental Division	Development Management, Environmental Division	No
Lancaster	Planning and Land Use	Planning and Land Use	Yes
Mathews	Dept. of Planning & Zoning	Dept. of Planning & Zoning	Yes
New Kent	Environmental Division, Community Development	Environmental Division, Community Development	Yes
Newport News	Dept of Engineering	Dept of Engineering	No
Norfolk	Planning	Planning	No
Northampton	Planning and Zoning	Planning and Zoning	Yes
Poquoson	Community Development Department/Planning and others	Community Development Department/Planning	some overlap
Westmoreland	SAA	Land Use Office	Yes
York	Environmental and Development Services	Environmental and Development Services	No

Figure 4. Table of Wetlands Board and Chesapeake Bay Board membership

The Current Issues

Contractors and agents working in multiple localities have expressed frustration over the lack of uniformity. They are frustrated by their inability to understand and anticipate program requirements in each locality. From their perspective this all translates to costs in time and effort to shepherd a project proposal through the entire regulatory process. An additional concern raised by the regulated community, as well as advisory agencies is the impact on decision consistency that arises from procedural variability and independent programmatic guidance. The perception is that the common

goals of the various regulatory programs might be more effectively promoted across the Commonwealth if there were greater uniformity in procedures and more substantive integration of guidance for the individual programs.

Other States Shoreline Management Programs

The tidal shoreline management programs in Massachusetts, Maryland and North Carolina were reviewed in detail to assess the structure of their shoreline management programs and to identify potential models for use in Virginia. Maryland and North Carolina were chosen as neighboring states with similar types of shorelines. Massachusetts was chosen because, like Virginia, private property ownership extends to mean low water. Other state programs were reviewed for specific elements of interest to this report including strategies for sustaining shoreline resources and use of living shoreline designs.

The relative complexity of multi-jurisdictional shoreline management is not unique to Virginia. Other states, particularly Massachusetts, have comparable local, state and federal agencies administering different legislative programs effecting shoreline resources.

Massachusetts

Analogous to Virginia's Wetlands Boards, Massachusetts has volunteer citizen conservation commissions. Commissions work in tandem with the state Department of Environmental Protection (DEP). The state agency promulgates regulations under the Wetlands Protection Act (WPA) and acts as the appellate body for commission decisions. Massachusetts commissions function with a broader scope of activities (they can hire staff and acquire and hold land for conservation purposes) than Virginia's local boards. The commissions also appear to operate under a more definitive guidance for decision-making that Virginia provides its local boards. The terms of permit review and decisions are largely prescribed by the WPA, DEP regulations and policies, and court decisions. In comparison, Virginia local boards are given broad latitude to draw their conclusions on evidence presented to them. Reviewing wetland permitting in Massachusetts, Payne (1998) concluded that the local governance of natural resources was effective, efficient, and fair in large part because it operates within a prescriptive state framework. This facilitates the balance of strong private interests which are fundamentally at odds with certain public interests. Brown and Veneman (2001) claim Massachusetts has one of the strictest regulation programs in the U.S. This assertion is partially based on Massachusetts commitment to achieve no net loss of wetlands through full compensation for all wetland impacts

North Carolina

North Carolina has a multijurisdictional shoreline management process with the Department of Environment and Natural Resources-Divisions of Water Quality and Coastal Management as the state lead agencies and the Coastal Resources Commission as the regulatory authority promulgating rules for

the Coastal Area Management Act and the Dredge and Fill Act. While management of tidal wetlands is largely administered at the state level, other environmental programs, such as erosion and sediment control, and storm water management are implemented at the local level through state delegated authority. North Carolina's shoreline management construct has somewhat fewer decision-making authorities than Virginia's.

Efficiency in North Carolina's program arises not only from centralized permitting, but also through use of general permits for routine development activities. For many years the state has had general permits for shoreline revetments and bulkheads, allowing property owners to proceed with a project as long as it met certain specifications. This approach had the unintended consequence of making it relatively easy to get a permit for projects we now understand negatively impact the long term functioning of shoreline systems. In 2003, the North Carolina legislature addressed this issue by authorizing a general permit for "living shorelines." These alternative designs for shoreline stabilization incorporate the objective of retaining, and in some cases enhancing the capacity of the shoreline system to provide beneficial habitat and water quality services while simultaneously reducing the risks of erosion. The intent was to replace an implied preference for hardened shorelines with a policy preference for more natural and sustainable shoreline management practices.

Maryland

Maryland shoreline management is similar to North Carolina in that the permitting responsibility for tidal wetlands falls to state agencies. Management of the riparian buffer is accomplished in a state-local program similar to Virginia's approach under the Chesapeake Bay Preservation Act. In Maryland buffers are protected by the Critical Area Act. The Act established a state level Critical Area Commission. The Commission developed criteria for local jurisdiction development of individual Critical Area programs which entail amendments to local comprehensive plans, zoning ordinances, and subdivision regulations.

Maryland passed the Living Shoreline Protection Act in 2008. The act requires the use of nonstructural erosion protection unless the owner can demonstrate the need for a more conventional shoreline hardening approach. Regulations have yet to be approved to implement the Act. The proposed regulations have been through several formal public reviews. Difficulties have arisen in getting agreements on certain definitions and under what circumstances is the need for a conventional shoreline hardening approach valid.

Potential Cost and Time Savings

Shoreline management in Virginia involves many decision-makers with compatible, albeit slightly different resource management objectives, permit requirements, and processing timelines. Making the permitting process as efficient as possible is an objective of both the regulators and the regulated community. The benefits will accrue to all parties in terms of reduced costs. An annual review of permit

cost in Virginia indicates the fees for a permit range between 55$ and 675$ with an average cost of 255$. Anecdotal information from local governments as well as VMRC indicates that the permit fees do not cover the cost in resource and staff time spent on the typical project review. As a result there is significant motivation to achieve new levels of efficiency.

Opportunities to reduce cost and time associated with shoreline management programs lie mostly in providing a more predictable, transparent process. Improved coordination among management agencies can achieve time and cost saving while at the same time improving the integration of the decisions. Savings can also be promoted by addressing gaps and over-laps in the collection of program regulation and guidance that impact permitting decisions. Integrated guidance can be developed to coordinate all programmatic interests and promote effective shoreline management. The guidance should identify preferred management options for all the various shoreline systems found in Virginia. The guidance can provide transparency in permit decisions for the regulated community by articulating criteria for project review and approval.

Integrated guidance can make use of decision-making flow charts such as the shoreline management decision trees currently under development at CCRM/ VIMS. These tools identify the key factors leading to a recommended management decision. They also codify a management preference that promotes sustainability of tidal shoreline resources through the use of natural habitats to abate erosion.

An important step in the development of unified guidance for management of tidal shoreline systems will be identification of all the potential conflicts among the various program regulations and guidelines. In order to be effective and efficient, any conflicts, whether gaps or cross-purpose decision-making, will need to be addressed.

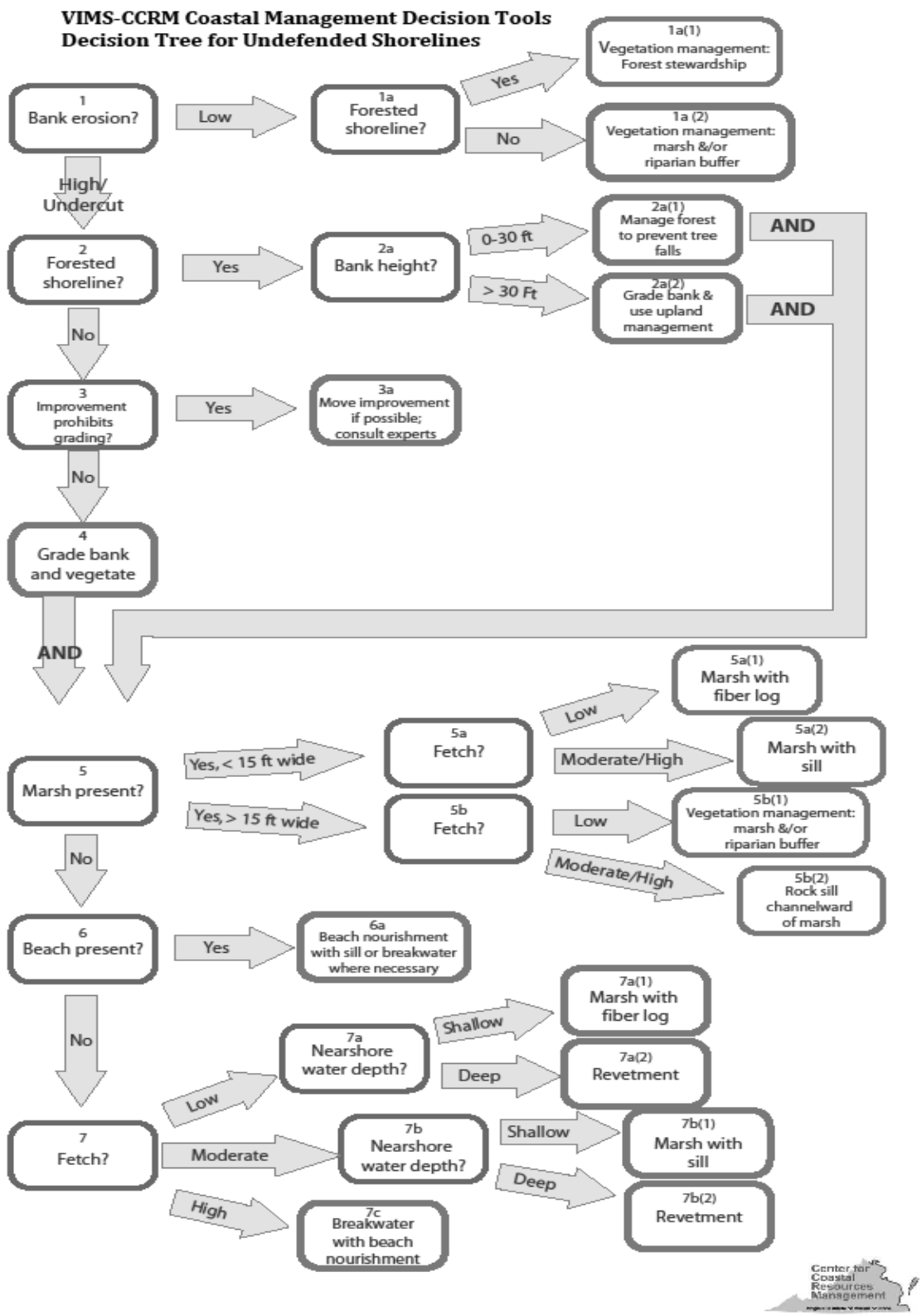

Figure 5. Decision tree for undefended Shorelines (See http://ccrm.vims.edu/decisiontree/index.html)

Recommendations

Virginia should develop integrated guidance for management of tidal shoreline systems. The guidance should identify preferred shoreline management approaches for the shoreline types found in Virginia. To the extent possible it should identify and explain the trade-offs in protection of various shoreline system elements associated with each management option. The objective is to provide a sound technical basis for coordination of all the permit decisions required by any shoreline management project. The intent should be for all regulatory authorities with purview over activities along Virginia's tidal shorelines to use the guidance to achieve greater collective efficiency and effectiveness in management of the Commonwealth's resources. Development of the guidance should be a cooperative effort involving the Department of Conversation and Recreation, the Virginia Marine Resources Commission, and the Virginia Institute of Marine Science.

A study to identify and assess any potential regulatory issues associated with development and implementation of integrated guidance for tidal shoreline management should be conducted.

Identify Regulatory Innovations to Promote Living Shorelines

Living shorelines are created or enhanced shorelines that make the best use of nature's ability to abate shoreline erosion while maintaining or improving habitat and water quality. Living shoreline treatments address erosion by providing long-term protection, restoration or enhancement of vegetated shoreline habitats through strategic placement of plants, stone, sand fill and other structural or organic materials (For a in-depth look at living shorelines ecosystem benefits, design/build information, and photographic examples, see the Center for Coastal Resources Management Living Shorelines website at: http://ccrm.vims.edu/livingshorelines/).

Application of living shoreline designs has become a widely accepted and preferred strategy for tidal shoreline management. Because they 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.

In Virginia, each of the regulatory programs managing shore resources tends to seek avoidance of impacts in areas under their jurisdiction. This preference for the status quo can be in conflict with living shoreline designs.

While not all living shoreline designs are identical, creating the necessary conditions can involve:

- grading the riparian area, disrupting or removing the natural vegetation and the associated pollutant removal capacity, and creating a conflict with local Bay Act code requirements; or
- moving design elements channelward to preserve an existing vegetated riparian area, impacting wetlands and creating a conflict with wetlands guidelines; or
- filling nearshore waters to create intertidal wetlands, creating significant conflicts with subaqueous land guidelines.

The consequence is that 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 successful promotion of living shorelines will require cooperative efforts by the regulatory and advisory authorities. Development and implementation of integrated guidance that coordinates these programmatic interests would be a necessary component.

There are many options for promotion of living shorelines in Virginia. These range from legal and regulatory requirements to public education. Havens et.al. (2006) identified a number of incentives that might be considered in Virginia. They include:

- General / Streamlined Permits
- Permit Fee Waivers
- Compensation Waivers
- Subaqueous Royalty Waivers
- Tax Assessment Reduction
- Cost Share
- Low Impact Development Credit
- Subdivision Ordinance Addition

Some of these options are already in practice in other states and Virginia. Table 1 identifies a number of the options and states using or developing them.

The options to promote living shorelines generally fall into two categories: financial and permitting relief. Financial incentives can involve waiver of permit costs or cost share for project design and construction. Cost share programs were particularly effective in Maryland and many of the projects on the ground were built with some funding support. Funding for these programs has changed dramatically, however. The cost share is no longer available, although there is still funding for zero interest loans.

Currently, opportunities for financial assistance in Virginia are limited. According to Davis and Luscher (2008), two programs that might provide some support in Virginia include: the Living Shorelines Initiative administered by the Chesapeake Bay Trust with National Oceanic and Atmospheric Administration Restoration Center, Campbell Foundation, and National Fish and Wildlife (NFWF) partners: and the Chesapeake Bay Small Watersheds Program administered by the NFWF. Both of these programs require individual private property owners to partner with a nonprofit organization.

There are many financial incentive options that could be successful in Virginia. However, many of the options functionally reduce fees or revenues which often help off-set the cost of regulatory permit programs. These options would potentially create a fiscal issue for agencies.

Permit relief in the form of exemptions, general permits, or permit preference seems to be a viable option. Permitting preference is already in use in Fairfax County, Virginia. This approach requires the applicant to demonstrate that a living shoreline project will not accomplish the desired erosion

protection goal if they propose some other project design. Essentially the living shoreline design is assumed to the appropriate choice absent a compelling argument to the contrary.

North Carolina is successfully operating a general permit program for structures placed to protect existing, or newly constructed, vegetated wetlands. The general permit language provides well-defined criteria to meet the conditions of the permit. This enables an efficient review of the application to verify if the permit criteria have been met. If the criteria are satisfied, the project is presumed to satisfy the public interest review, and approval is expedited.

Permitting relief is an option which if properly crafted, offers time and cost savings to property owners and permitting authorities. Depending upon the form that such relief might take, regulatory or legislative action is probably necessary.

Virginia does not have an official position on the use of living shorelines for erosion protection. A statement of policy that identifies a preference for the use of existing or enhanced natural shoreline habitats for erosion protection would provide recognition that living shoreline designs are a desirable approach for many of the Commonwealth's tidal areas.

Options to Promote Living Shorelines		
Approach	State(s) using Approach	Implementation/ Authority
State Legislative Requirement	Maryland[1]	Living Shoreline Protection Act 2008
State Regulation to prefer natural shorelines for erosion control	Alabama	Alabama Department of Environmental Management
General Permit	North Carolina[1,2]	N.C. Division of Coastal Management
Exemption from state permit	Northwest Florida	Department of Environmental Protection Northwest Florida
Design Assistance	Maryland	Maryland Department of the Environment (MDE)
Cost-share/low-no interest loans	North Carolina, Texas, Maryland[2]	NC Coastal Federation, various Texas entities, MDE
Water Quality Revolving Loan - Nonpoint sediment control	proposed Maryland[3]	Maryland Water Quality Financing Administration (MWQFA), a unit within MDE
Permit fee waiver	Maryland	Maryland Department of the Environment
Tax Incentives	Oregon, Virginia	Oregon Department of Fish and Wildlife, Virginia Localities
Permitting preference	Fairfax County, Virginia	Fairfax County Wetlands Board, Department of Planning and Zoning

Figure 6. Options to Promote Living Shorelines

Alabama http://www.alabamaadministrativecode.state.al.us/docs/con_/McWord220-4.pdf

Maryland 1. http://mlis.state.md.us/2008rs/chapters_noln/Ch_304_hb0973E.pdf

2. http://www.dnr.state.md.us/ccws/sec/download/SECFinancialAssistanceMatrix4-14-08.pdf

3.http://www.mde.state.md.us/programs/Water/QualityFinancing/Documents/www.mde.state.md.us/CW%20DW%20draft%20IPPS/CW%20IPPS_100810_PC%20Draft.pdf

North Carolina 1 General Permit: http://www.nccoastalmanagement.net/Hazards/7H%20Section%202400%20-%20approved%20for%20public%20hearing%2020080328.pdf

2. Legislation: http://www.ncleg.net/Sessions/2003/Bills/House/HTML/H1028v8.html

Florida https://www.flrules.org/gateway/RuleNo.asp?title=Environmental%20Resource%20Permitting%20in%20Northwest%20Florida&ID=62-346.051

Oregon http://www.dfw.state.or.us/lands/tax_overview.asp

Virginia § 58.1-3666. http://lis.virginia.gov/cgi-bin/legp604.exe?000+cod+58.1-3666

Fairfax County, Virginia http://www.fairfaxcounty.gov/dpz/environment/finallivingshoreline.pdf

Recommendations

Virginia should officially identify a preference for living shoreline designs as a management strategy for tidal shoreline systems. The policy could be articulated in the form of legislation, executive order, or regulation. However, a regulatory preference promulgated by one agency does not guarantee the same for other management entities. This might, therefore, fall short of establishing a unifying focus for regulatory programs that could improve efficiency and effectiveness of the Commonwealth's shoreline management efforts. For this reason, a legislative or executive action would be preferable.

Virginia should develop and implement a general permit for living shorelines. The permit development process should involve the Department of Conversation and Recreation, the Virginia Marine Resources Commission, and the Virginia Institute of Marine Science, with technical assistance from other shoreline management entities as necessary. The process should be coordinated with the U.S. Army Corps of Engineers to avoid conflicts with their permitting requirements. The Corps makes regular use of generalized permits in Virginia, as regional and nationwide permits, and provides one model for development of the general permit. Virginia already has one general permit in place for emergency activities in tidal wetlands, and several others for activities in subaqueous lands.

Recommendations to Achieve Sustained Protection of Tidal Shoreline Resources

Natural and human pressures on shoreline resources are great. These pressures include; the effects of shoreline hardening, losses due to erosion and land conversion and marsh drowning from relative sea level rise. 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 wetland, 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. 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 necessarily comprehensive allowing for both well informed permit decision-making in the moment as well as future planning.

One approach to comprehensive shoreline plans is under development at the Center for Coastal Resources Management at VIMS. This approach creates plans 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 and development of shoreline plans by the state could be readily incorporated to meet that requirement.

Washington State has a program of comprehensive shoreline. The Shoreline Management Act (RCW 90.58) was passed in 1971 to prevent "the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." The Act applies to tidal shorelines and adjoining lands extending about 200 feet landward of the shore. State guidelines promulgated by the Washington Department of Ecology assist local governments in developing, adopting, and amending master programs that are consistent with the policy and provisions of the act. The Act requires local governments to have shoreline master programs that govern armoring and other shoreline activities (See www.ecy.wa.gov/programs/sea/shorelines/smp/index.html).

Preservation of Virginia's tidal shoreline resources will require similar proactive efforts.

Recommendation

Virginia should advance the efforts currently underway at VIMS to develop and promulgate comprehensive coastal resource management plans for all Tidewater localities. The plans 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 adapt to changing conditions in the coastal zone, including sea level rise.

Virginia should promote the education of both public officials and the general public regarding the need for integrated shoreline management. Success in managing the risks to both human and natural resources will require both regulators and the regulated community to understand the issues and adjust expectations for what is possible and what is appropriate along Virginia's shorelines.

Acronyms

CBPA	Chesapeake Bay Preservation Act
CCRM	Center for Coastal Resources Management
Corps	United States Army Corps of Engineers
E & S	Erosion and Sediment Control
DCR	Department of Conversation and Recreation -Virginia
DCR- CBLA	Department of Conversation and Recreation, Chesapeake Bay Local Assistance - Virginia
DCR- SWC	Department of Conversation and Recreation, Soil and Water Conservation - Virginia
DEP	Department of Environmental Protection- Massachusetts
MDE	Maryland Department of the Environment
NRCS	Natural Resources Conservation Service
NPS	Non-Point Source Pollution
NWF	National Wildlife Federation
VDEQ/ DEQ	Virginia Department of Environmental Quality
VMRC	Virginia Marine Resources Commission
VIMS	Virginia Institute of Marine Science
WB	Wetlands Board - Virginia
WPA	Wetlands Protection Act - Massachusetts

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