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## Virginia's Coastal Program: Strategic Mapping of Management Goals

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# Virginia's Coastal Program: Strategic Mapping of Management Goals

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To Department of Environmental Quality  
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## INTRODUCTION

Virginia's Coastal Resources Management Program is a networked program bringing together the activities of many state agencies and institutions to achieve the overarching mission of coastal zone management. The Program's objectives were originally set out in a series of 25 goals in the 1986 Executive Order (see Appendix B) that established the Program for the Commonwealth under the federal Coastal Zone Management Act. Beginning in May of 1999, representatives of the Virginia state agencies involved with the networked Coastal Program attended a series of meetings to develop logic maps of these twenty-five goals. This document represents the final results of these efforts, which took place over a two and a half year period. The goals which were mapped are the results of early efforts to reformulate the goals to better fit today's social, economic and environmental objectives, and as such include several rewrites and one combination of two of the original goals, resulting in a total of 24 mapped Program Goals.

Each of these goals was broken down into a series of components to allow the Program to meet a threefold objective: 1) to consider an ideal plan for achieving the net result indicated by the goal; 2) to identify elements that do not yet exist but need to be developed to meet the end goals; and 3) to obtain a series of measures by which to assess progress at each step of the process of achieving the goals.

Although the process used a series of mapping charts, these have been rearranged here in outline format to facilitate readability in a printed document. Figure 1 provides a schematic for how the mapping elements fit together.

In this process, each of the Program Goals were broken down into a set of Strategic Goals, defined as the measurable end result(s) which needs to be achieved to meet the Program Goal. Under each of these are the corresponding Intermediate Goals, defined as activities that need to be undertaken to arrive at the Strategic Goals.

Associated with each of the Strategic Goals are the Existing Programs and Missing Elements that provide (or would provide, in the case of the Missing Elements) the tools to realize the Intermediate and Strategic Goals. These have been arranged under the following categories to help clarify and standardize the mapping:

1. Outreach – this category includes public information, technical support, and voluntary compliance measures
2. Regulation – legal authority and/or enforcement
3. Authority – under “Missing Elements” only – identifies need for new or enhanced regulatory authority
4. Monitoring
5. Planning /coordination – at state, local or regional level
6. Research
7. Definition of management targets – under “Missing Elements” only – includes recommendations for new policy and/or explicit definitions of management objectives

Associated with each Strategic Goal is a list of measures, aimed at providing justification of the progress the Program has made in achieving the Strategic Goal .

Finally, Reach and Context are listed at the end, and are defined as follows:

Reach – includes those people or groups whose attitudes and/or behavior we need to affect to arrive at our goal

Context – those things which influence our ability to achieve our goals, but which are beyond our control (such as weather, the economy, etc.)

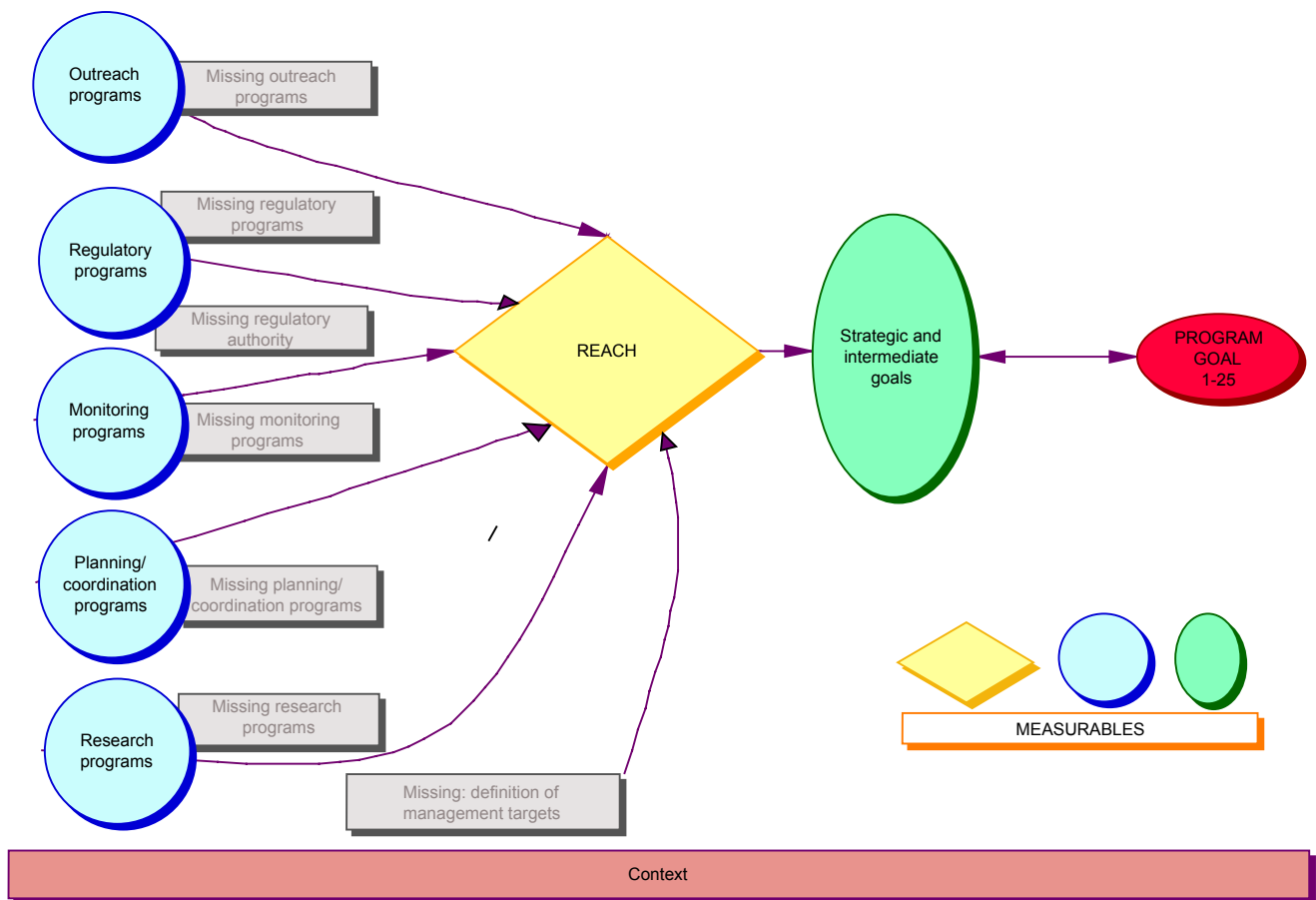


Figure 1. Conceptual diagram of the logic mapping model, in which the Existing Programs (blue circles) and missing elements (gray rectangles) affect the people and/or groups identified in Reach to produce the Strategic and Intermediate Goals associated with the Program Goals

It is our hope that these maps, compiled with such effort and consideration by the members of the Coastal Policy Team, will serve as a valuable tool for guiding the Commonwealth of Virginia in the continued protection and sustainable use of her bountiful coastal resources.

## LIST OF GOALS

- Goal 1 To maintain, protect and/or improve the coastal water quality for the growth and survival of aquatic life and water recreation uses.
- Goal 2 To reduce polluted surface and groundwater runoff to coastal waters, caused by inadequate land management practices.
- Goal 3 To prevent damage to coastal resources from hazardous materials through effective planning, management, and cleanup programs.
- Goal 4 To protect air quality
- Goal 5 To protect the public health from contaminated seafood.
- Goal 6 To preserve, increase, and protect wetlands
- Goal 7 To protect and improve submerged land habitat
- Goal 8 Minimize damage to the productivity and diversity of the marine environment resulting from the disruption of finfish and shellfish population balances.
- Goal 9 To reduce the adverse effects of sedimentation on coastal aquatic habitats
- Goal 10 Maintain and improve natural communities and preserve rare species
- Goal 11 Conserve and improve coastal sand dune systems
- Goal 12 To reduce or prevent losses of public and private property and facilities caused by shorefront erosion
- Goal 13 To protect life and property from coastal flooding and storms
- Goal 14 To promote the wise use of coastal resources for the economic benefit and employment of the citizens of the Commonwealth.
- Goal 15 To protect and maintain existing uses of estuarine waters for shellfish propagation and marketing
- Goal 16 To guide business location on coastal waters where essential to desired economic activities.
- Goal 17 To improve long-term development patterns through effective coordination of governmental planning processes
- Goal 18 To improve or maintain productive fisheries.
- Goal 19 To encourage exploration and production of oil and gas resources off the Atlantic coast
- Goal 20 To provide for the appropriate extraction of mineral resources (sand mining and shell mining) in a manner consistent with proper environmental practices.
- Goal 21 To add new and improve existing public access to coastal waters and shorefront lands for a variety of recreational uses throughout the coastal area .
- Goal 22 To provide a local government shoreline permitting process that addresses environmental issues and appropriate mitigation while providing a timely response to applicants
- Goals 23/24 To provide private citizens and public officials with technical advice necessary to make sound decisions regarding uses of and impacts on coastal resources
- Goal 25 To develop, improve and maintain base data, maps, and photoimagery, accessible and supportive of decision-makers' needs

## **1. To maintain, protect and/or improve the coastal water quality for the growth and survival of aquatic life and water recreation uses**

**Strategic Goal A:** Point and NPS loads, as well as temperature and other physical factors (salinity, etc.) at “safe” levels

### **Strategic Goal A Measures:**

- Decrease in nitrogen to safe levels
- Decrease in TSS to safe levels
- Stable temperature at appropriate level
- Increase in DO to appropriate levels
- Decrease in fecal coliforms to safe levels
- Reduction in stormwater runoff to safe levels

### **Intermediate Goals:**

1. Change public understanding of pollutants delivered to waterways /change behavior
2. Establish regulatory control and “safe levels” at point source and in waterways
3. Encourage appropriate stewardship for nutrients /micro-biologicals/runoff management at “safe” levels

### **Intermediate Goal Measures:**

- Increase in wetland area permanently protected
- Decrease in the number of wetland permits issued
- Decrease in area of wetland impacts permitted
- Increase in riparian area permanently protected
- Increase in the amount of area placed in easements of fee-simple acquisition
- Decrease in failing septic systems
- Trend in number of permits for new development
- Trend in permits for redevelopment
- Increase in number of developments using LID (Low Impact Development)
- Number of total maximum daily loads (tmdl's) implemented
- Decrease in percentage of waterways with anoxic conditions
- Increase in number of Best Management Practices (BMPs)
- Increase in number of comp plans with required environmental components
- Increase in number of comp plans implemented
- Increase in number of 5 year septic pump-outs
- Decrease in number of buffer violations
- Increase in number of agricultural conservation plans
- Increase in number of forestry BMPs
- Decrease in number of forestry violations
- Increase in percentage of reach showing improve understanding of pollutants delivered to waterways and their effects (via survey)



## **EXISTING PROGRAMS:**

### **1. Outreach**

- Adopt a stream
- Agricultural Stewardship Program  
VDACS
- Boater Education – Coast Guard
- CBC
  - Nutrient Reduction Program
  - Riparian Buffer Program
  - Toxics Reduction Program
- CBLAD
  - Education
  - Technical assistance
  - GIS
- Citizen Watershed groups
- DCR
  - Agricultural BMP's cost-share
  - Clean Marina Program
  - Conservation Reserve Enhancement Program
  - NPS Education Activities
  - NPS Grant Funds
  - NPS TMDL efforts
  - Nutrient Management Program
    - Farm Nutrient and Pesticide Application Equipment Tax Credit Program
    - Nutrient Management Certification
    - Urban Nutrient Management
  - SCS extension program
- DEQ
  - Wastewater treatment plant training
  - Pollution prevention program- DEQ
  - Point Source TMDL efforts
- VDH
  - Marina Program - education
- ERP Restoration Program
- EPA watershed academy
- HRSD municipal assistance
- HRSD Nutri-green Compost
- Stormwater- Voluntary implementation
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative
- Water quality improvement fund

## **MISSING ELEMENTS**

### **1. Outreach**

- Enhance technical and financial assistance to localities to implement the CBPA
- Expand public education using all types of media
- Expand program/methods to reduce agriculture, golf course and lawn use of chemicals
- Coordination of citizen monitoring

## 2. Regulation

- CBLAD
  - comp plan requirements
- Coast Guard Oil Spill Response Program
- DCR
  - E & S – DCR/ local
  - Non-point source pollution – Section 6217
  - Nutrient management program
  - Stormwater (State projects)
- DEQ
  - VPDES
  - Pollution abatement permits- DEQ
  - Water quality standards – DEQ
  - Groundwater Management
  - Surface Water Withdrawal Permits
  - Water Protection Permit
  - Nontidal Wetland Permit
- EPA Human Health Criteria
- Local Ordinances
- Riparian Buffer Initiative
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- TMDLs
- VDACS pesticides and groundwater program
- VDH
  - Pumpout requirements at marinas

N/A

## 3. Monitoring

- ACB citizen monitoring
- CBNERRS monitoring
- Ches. Bay monitoring – DEQ
- NOAA sediment monitoring program
- Shoreline survey - VDH
- Seawater sampling – VDH
- Polecat creek monitoring -CBLAD
- USGS water quality monitoring
- Toxic Release Inventory

## 2. Regulation

- Required use of pump-out facilities
- Implement no discharge zones
- VDH complete effort to identify/repair/replace failing septic systems
- Identify and enforce areas unsuitable for septic system placement
- Full enforcement of 5 year septic pump-out requirement
- Full enforcement of the 100' buffer/increase riparian buffers
- VDH/DEQ complete and enforce source water protection plans
- VDACS better enforcement of Ag Stewardship Act
- Mandate statewide stormwater ordinance development & implementation
- E&S full local implementation

## 3. Authority

- Develop statutory authority for impact fees and transferable development rights

## 4. Monitoring

- Develop effective/adequate monitoring of water quality throughout the coastal zone (especially seaside Eastern shore, small streams, public beaches)

- VDH monitoring program
- VIMS Shoal Water Quality Monitoring

**4. Planning/coordination -**

- CBP/DEQ water quality models
- Elizabeth River Action Plan
- CBP Environmental Endpoints
- Coastal Non-point Program
- Oyster Restoration Programs
- PDC land-use planning
- Regional Transportation Planning
- Toxics 2000 strategy
- Tributary Strategies

**5. Research**

- Comprehensive Coastal Inventory –VIMS

N/A

**5. Planning/coordination**

- Establish coordination between state programs, and state and local management programs
- Support efforts for infill development, capacity planning
- Develop shoreline management protocol

**6. Research**

- Water quality and sediment problems due to legacy contamination

**7. Definition of management targets**

- Define “safe”
- Develop “endpoints” for ocean coastal waters
- Define appropriate and sustainable water recreation uses

**Strategic Goal B:** Aquatic life showing no significant negative effects from pollution

**Strategic Goal B Measures:**

- Decrease in number of animals with lesions
- Decrease in percentage of fish cultures showing toxic levels above standards
- Decrease in number of animals stranded/dead due to pollutants
- Decrease in number of fish kills

**Intermediate Goals:**

1. Change public understanding of pollution effects on ecosystem/change behavior
2. Identify pollutants and quantify levels at which they affect organisms/reduce loads to below this point.

**Intermediate Goal Measures:**

- Decrease in number of water quality violations
- Increase in number of water quality monitoring stations (meet standards)
- Increase in percentage of reach showing improved understanding of pollutants delivered to waterways and their effects on ecosystems (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Agricultural Stewardship Program VDACS
- Boater Education – Coast Guard
- CBC
  - Nutrient Reduction Program
  - Riparian Buffer Program
  - Toxics Reduction Program
- CBLAD
  - Education
  - Technical assistance
- Citizen Watershed groups
- DCR
  - Ag. BMP's cost-share
  - Clean Marina Program
  - Conservation Reserve Enhancement Program
  - NPS Education Activities
  - NPS Grant Funds
  - NPS TMDL efforts
  - Nutrient Management Program
    - Farm Nutrient and Pesticide Application Equipment Tax Credit Program
    - Nutrient Management Certification
    - Urban Nutrient Management
  - SCS extension program

**MISSING ELEMENTS**

**1. Outreach**

- Enhance technical and financial assistance to localities to implement the CBPA
- Expand public education using all types of media

- DEQ
  - Wastewater treatment plant training
  - Pollution prevention program- DEQ
- ERP Restoration Program
- EPA watershed academy
- HRSD municipal assistance
- Stormwater- Voluntary implementation
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative
- Water quality improvement fund
- VDH Marina Program - education

## 2. Regulation

- CBLAD
  - comp plan requirements
- Coast Guard Oil Spill Response Program
- DCR
  - E & S – DCR/ local
  - Non-point source pollution – Section 319 and Section 6217
  - Nutrient management program
  - Stormwater – state agency projects
- DEQ
  - VPDES
  - Pollution abatement permits- DEQ
  - Water quality standards – DEQ
  - Groundwater Management
  - Surface Water Withdrawal Permits
  - Water Protection Permit
  - Nontidal Wetland Permit
- EPA Human Health Criteria
- Local Ordinances
- Riparian Buffer Initiative
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- TMDLs
- VDACS pesticides and groundwater program
- VDH toilet and pumpout requirements at marinas

N/A

## 2. Regulation

- VDACS better enforcement of Ag Stewardship Act
- Mandate statewide stormwater ordinance development & implementation
- E&S full local implementation

## 3. Authority

### **3. Monitoring**

- ACB citizen monitoring
- CBNERRS monitoring
- Ches. Bay monitoring – DEQ
- NOAA sediment monitoring program
- Shoreline survey – VDH
- Seawater sampling – VDH
- Polecat creek monitoring –CBLAD
- USGS water quality monitoring
- Toxic Release Inventory
- VDH monitoring program
- VIMS Shoal Water Quality Monitoring

### **4. Planning/coordination -**

- CBP water quality models
- Elizabeth River Action Plan
- CBP Environmental Endpoints
- Coastal Non-point Program
- Oyster Restoration Programs
- PDC land-use planning
- Regional Transportation Planning
- Toxics 2000 strategy
- Tributary Strategies

### **5. Research**

- Comprehensive Coastal Inventory –VIMS

### **4. Monitoring**

- Develop effective/adequate monitoring of water quality throughout the coastal zone (especially seaside Eastern shore, small streams, public beaches)
- Establish and maintain fisheries/living resource stock assessment

### **5. Planning/coordination**

- Establish coordination between state programs, and state and local management programs

### **6. Research**

- Expand understanding of water quality impacts on living resources
- Develop stream reference reach data based on physical, habitat and biological characteristics

### **7. Definition of management targets**

- Identify what species to protect/improve
- Develop “endpoints” for ocean coastal waters

N/A

**Strategic Goal C:** No beach or water closures due to pollution; no pollution-related illness in recreational users

#### **Strategic Goal C Measures:**

- Reduction in area of beach closure advisories
- Decrease in number of illness reported

**Intermediate Goals:**

1. Change public understanding of negative human health effects from pollution/change behavior
2. Quantify pollutant levels that negatively affect humans/reduce loads to below this point
3. Monitor and issue advisories on unsafe pollutant levels for recreational users

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of pollutants delivered to waterways and their effects on human health (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Adopt a stream
- Agricultural Stewardship Program VDACS
- Boater Education – Coast Guard
- CBC
  - Nutrient Reduction Program
  - Riparian Buffer Program
  - Toxics Reduction Program
- CBLAD
  - Education
  - Technical assistance
- Citizen Watershed groups
- DCR
  - Ag BMP's cost-share
  - Clean Marina Program
  - Conservation Reserve Enhancement Program
  - NPS Education
  - NPS Grant funds
  - Nutrient Management Program
    - Farm Nutrient and Pesticide Application Equipment Tax Credit Program
    - Nutrient Management Certification
    - Urban Nutrient Management
  - SCS extension program
- DEQ
  - Wastewater treatment plant training
  - Pollution prevention program- DEQ
- ERP Restoration Program
- EPA watershed academy
- HRSD municipal assistance

**MISSING ELEMENTS**

**1. Outreach**

- Enhance technical and financial assistance to localities to implement the CBPA
- Expand public education using all types of media

- Stormwater- Voluntary implementation
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative
- Water quality improvement fund
- VDH Marina Program - Education

## 2. Regulation

- CBLAD
  - comp plan requirements
- Coast Guard Oil Spill Response Program
- DCR
  - E & S – DCR/ local
  - Non-point source pollution – Section 319 and Section 6217 Nutrient management program
  - Stormwater – state projects
- DEQ
  - VPDES
  - Pollution abatement permits- DEQ
  - Water quality standards – DEQ
  - Water Protection Permit
  - Nontidal Wetland Permit
- Department of Health
- EPA Human Health Criteria
- Local Zoning
- Riparian Buffer Initiative
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- TMDLs
- VDACS pesticides and groundwater program
- VDH toilet and pumpout requirements at marinas

N/A

## 3. Monitoring

- ACB citizen monitoring
- CBNERRS monitoring
- Ches Bay monitoring – DEQ
- NOAA sediment monitoring program
- Shoreline survey - VDH
- Seawater sampling – VDH

## 2. Regulation

- Required use of pump-out facilities
- Implement no discharge zones
- VDH complete effort to identify/repair/replace failing septic systems
- Identify and enforce areas unsuitable for septic system placement
- Full enforcement of 5 year septic pump-out requirement
- Full enforcement of the 100' buffer/increase riparian buffers
- VDH/DEQ complete and enforce source water protection plans
- VDACS better enforcement of Ag Stewardship Act
- SW mandate stormwater ordinance implementation
- E&S full local implementation

## 3. Authority

## 4. Monitoring

- Develop effective/adequate monitoring of water quality throughout coastal zone (especially seaside Eastern shore, small streams, public beaches)



- Polecat creek monitoring -CBLAD
- USGS water quality monitoring
- Toxic Release Inventory
- VDH monitoring program
- VIMS Shoal Water Quality Monitoring

**4. Planning/coordination -**

- Elizabeth River Action Plan
- CBP Environmental Endpoints
- Coastal Non-point Program
- PDC land-use planning
- Toxics 2000 strategy
- Tributary Strategies

**5. Planning/coordination**

- Establish coordination between state programs, and state and local management programs

**5. Research**

- Comprehensive Coastal Inventory – VIMS

**6. Research**

- Develop data necessary to generate and implement TMDL models for coastal waters

N/A

**7. Definition of management targets**

**REACH**

1. Land owner/ occupant
2. Industrial/ municipal dischargers
3. Airshed dischargers
4. Water recreational users
5. Government decision makers
6. Land owner/ occupant
7. Industrial/ municipal dischargers
8. Airshed dischargers
9. Water recreational users
10. Government decision makers
11. Land owner/ occupant
12. Industrial/ municipal dischargers
13. Airshed dischargers
14. Water recreational users
15. Government decision makers

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT:**

1. Regulatory framework
2. Property rights

3. Access
4. Environmental/physical conditions
5. Status of the economy

**2. To reduce polluted surface and groundwater runoff to coastal waters, caused by inadequate land management practices**

**Strategic Goal A:** NPS loads at “safe” levels

**Strategic Goal A Measures:**

- Increase in number of previously impaired waters delisted within the state, from both the 303(d) and 305(b) lists

**Intermediate Goals:**

1. Change public understanding of NPS pollution effects/ change behavior
2. Identify and minimize inappropriate land use
3. Conduct Commonwealth-wide land management /stewardship for nutrients/toxics/ runoff
4. Conserve/preserve resource lands
5. Establish and implement regulatory and non-regulatory control and “safe” levels for NPS from all sources

**Intermediate Goal Measures:**

- Increase in monitoring of pollutant loads to surface and ground water
- Increase in percentage of land use under a BMP
- Increase in percentage of compliance with regulatory programs
- Increase in percentage of coastal area of state covered by watershed management programs
- Reduction in RPA variances
- Reduction in RPA violations
- Increase percent compliance with E&S law (to 100%)
- Increase in miles of forested buffer shoreline
- Increase in percentage of reach showing improved understanding of NPS pollutants delivered to waterways and their effects (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Adopt a stream
- Agricultural Stewardship Program  
VDACS
- Boater Education – Coast Guard
- CBC
  - Nutrient Reduction Program
  - Riparian Buffer Program
  - Toxics Reduction Program
- CBLAD
  - Education
  - Technical assistance
- GIS
- Citizen Watershed groups
- DCR
  - Ag BMP cost-share program

**MISSING ELEMENTS:**

**1. Outreach**

- Increased number and type of educational efforts
- Provide incentives to help people with cost share contribution in voluntary programs

- Clean Marina Program
- SEAS
- NPS Education
- NPS Grant Funds
- NPS TMDL effort
- Nutrient Management Program
  - Farm nutrient and pesticide application equipment tax credit
  - Nutrient Management Certification
  - Urban Nutrient Management
- Conservation Reserve Enhancement Program
- DEQ
- Pollution Prevention Program
- Wastewater treatment plant training
- EPA watershed academy
- ERP Restoration Program
- Farm Nutrient and Pesticide Application Equipment Tax Credit Program –
- Farm Pond Management –DGIF
- Nutri-green Compost – HRSD
- Ridefinders
- Water Quality Programs – Forestry
- Riparian Forest Buffer Initiative
- Water quality improvement fund

## 2. Regulation

- CBLAD program
- CBPA requirements
- DCR
  - Coastal nonpoint program
  - Erosion and sediment control – DCR/ local
  - Stormwater – state projects
- DEQ
  - Groundwater Management
- Nontidal Wetland Permit
  - Water Protection Permit
- Local Zoning
- Pesticides and groundwater program VDACS
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- TMDLs

## 2. Regulation

- Develop statutory authority for impact fees and transferable development rights
- CBLAD - full enforcement of the 100' buffer/full implementation of soil and water conservation plans
- VDH/DEQ - complete and enforce source water protection plans
- DCR/DEQ- enforce poultry waste regulations
- VDACS - better enforcement of Ag. Stewardship Act.
- Mandate statewide stormwater ordinance development & implementation
- E&S full local implementation
- Reduce wetland losses

N/A

### 3. Monitoring

- Alliance citizen monitoring
- CBNERRS monitoring
- DEQ Ches Bay monitoring
- VDH
  - Shoreline survey
  - Seawater sampling
- Polecat creek monitoring - CBLAD
- USGS water quality monitoring
- VIMS Shoal Water Quality Monitoring

### 4. Planning/coordination

- CB water quality models
- CBP Environmental Endpoints
- Coastal Non-point Program
- Elizabeth River Action Plan
- PDC economic development and comp plans
- Regional Transportation Planning
- State/regional/local open space plans
- Tributary Strategies

### 5. Research

- Comprehensive Coastal Inventory –VIMS

N/A

### REACH

Land owner/ occupant  
Industrial/ municipal dischargers  
Airshed dischargers

### 3. Authority

- Expand BMP's to be mandatory
- Provide flexibility in meeting stormwater requirements
- Develop local enabling authority/state leadership
- Fund DEQ to address "animal units" in smaller numbers
- Strengthen CBPA

### 4. Monitoring

- Identify fecal coliform sources
- Establish and maintain inventory of land use changes
- Monitoring of shallow ground water system (unconfined aquifer)

### 5. Planning/coordination

- Identify and regulate areas unsuitable for septic systems
- Develop local shoreland management protocol
- Establish growth management efforts
- Increase open space preservation efforts
- Coordinate with transportation planning
- Link local, state and federal programs that track land use management

### 6. Research

### 7. Definition of management targets

Water recreational users  
Government decision makers

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Regulatory framework  
Property rights  
Access  
Environmental/physical conditions  
Status of Economy

### **3. To prevent damage of coastal resources from hazardous materials through effective planning, management, and cleanup programs**

**Strategic Goal A:** Improved prevention, containment and cleanup programs for toxics/ hazmat

#### **Strategic Goal A Measures:**

- Decrease in response time to spills
- Decrease in amount of toxics released
- Increase in percentage of spill contained/cleaned up

#### **Intermediate Goals:**

1. Change public/ planners understanding of the effects of potential spills, outfalls, etc.
2. Establish effective cleanup and containment technology/ techniques to minimize hazards from toxics/ hazmat released to coastal environment
3. Create and maintain a database of hazmat, potential hazmat potential risks of hazmat

#### **Intermediate Goal Measures:**

- Increase in the number of hazardous material clean-ups, “round-ups”
- Increase in monitoring of toxic releases
- Increase in number and funding for projects to develop new cleanup technology and techniques
- Increase in percentage of reach showing improved understanding of the effects of potential spills, outfalls, etc. (via survey)

#### **EXISTING PROGRAMS:**

##### **1. Outreach**

- CBC Toxics Reduction Program
- Clean Marina Program
- ECOS state innovation programs
- ERP Restoration Program
- Farm Nutrient and Pesticide Application Equipment Tax Credit Program
- Pollution Prevention Program - DEQ
- Ridefinders
- Small Business Environmental Compliance Assistance Fund
- Virginia Environmental Excellence Program

##### **2. Regulation**

- Air Toxics Program (TRI)
- Bay Act Requirements
- Coast Guard Oil Spill Response Program
- Landfill/Landfill Closure Listings (DEQ)

#### **MISSING ELEMENTS:**

##### **1. Outreach**

- Increase education to local planners
- Identify options for incorporating P2 efforts in site plan review process, use of performance criteria, or bulk regulations

##### **2. Regulation**

- Enhanced funding and staff at DCR for floodplain mgmt

- Local Zoning
- Pesticides and groundwater program  
VDACS
- Pollution Response Program
- RCRA- DEQ
- SARA Title III
- Stormwater Management Act  
Programs- DCR/ CBLAD/ DEQ
- VDOT transportation permits
- Waste permittings

N/A

**3. Authority**

- Require local implementation of a floodplain ordinance

**3. Monitoring**

- Toxic Release Inventory
- VIMS TBT studies

**4. Monitoring**

- Update inventories of sources and sensitive environmental resources

**4. Planning/coordination**

- CBP Toxics 2000 strategy
- Local fire department/emergency management
- Regional Transportation Planning
- Virginia Department of Emergency Services Programs
- VDH Shoreline Survey - dumpsites

**5. Planning/coordination**

- Expand financial resources to address identified sources
- Develop a comprehensive risk assessment

**5. Research**

- VIMS BDE

**6. Research**

N/A

**7. Definition of management targets**

**Strategic Goal B:** Appropriate site selection and planning occurring for toxic runoff

**Strategic Goal B Measures:**

- increase in redevelopment for industrial properties
- decrease industrial development in pristine area

**Intermediate Goals:**

1. Change public/ planners understanding of the effects of potential spills, outfalls, etc
2. Establish zoning regulations for siting of potential hazmat producers
3. Promote industry standards for safeguards/ proper planning for each hazmat type



4. Advanced planning for site selection

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of the effects of potential spills, outfalls, etc. (via survey)
- Improve coordination of site selection process with environmental review

**EXISTING PROGRAMS:**

**1. Outreach**

- CBC Toxics Reduction Program
- Clean Marina Program
- ECOS state innovation programs
- ERP Restoration Program
- Farm Nutrient and Pesticide Application Equipment Tax Credit Program
- Pollution Prevention Program - DEQ
- Ridefinders
- Small Business Environmental Compliance Assistance Fund
- Virginia Environmental Excellence Program

**2. Regulation**

- Air Toxics Program (TRI)
- Bay Act Requirements
- Coast Guard Oil Spill Response Program
- Landfill/Landfill Closure Listings (DEQ)
- Local Zoning
- Pesticides and groundwater program VDACS
- Pollution Response Program
- RCRA- DEQ
- SARA Title III
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- VDOT transportation permits
- Waste permitting

N/A

**3. Monitoring**

- Toxic Release Inventory

**MISSING ELEMENTS:**

**1. Outreach**

- Increase education to local planners
- Identify options for incorporating P2 efforts in site plan review process, use of performance criteria, or bulk regulations

**2. Regulation**

- Enhanced funding and staff at DCR for floodplain management

**3. Authority**

- Enable zoning for marina development

**4. Monitoring**

- Update inventories of sources and

sensitive environmental resources

**4. Planning/coordination**

- CBP Toxics 2000 strategy
- Local fire department/emergency management
- Regional Transportation Planning
- Virginia Department of Emergency Services Programs

**5. Planning/coordination**

- Coordinate state/regional/local planning
- Develop a comprehensive risk assessment

**5. Research**

N/A

**6. Research**

**7. Definition of management targets**

**REACH**

Hazardous materials users - e.g. , industries, gas stations, farmers, truckers, shippers, dry docks, marinas, households, etc

Business decision makers

Government decision makers

Dept. of Defense

**Reach Measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Politics

NIMBY

Financial constraints

Current attitudes among decision-makers

Public awareness

#### **4. To protect air quality**

**Strategic Goal A:** Air quality at “safe” levels for human health

**Strategic Goal A Measures:**

- Reduction in number of ozone alert days
- Reduction in number of air-quality related human health incidents reported (e.g. asthma cases on high ozone days)

**Intermediate Goals:**

1. Change public understanding/ behavior
2. Identify safe levels for human health
3. Promulgate regulations and incentives for all industries to keep emissions to a safe minimum

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of air quality and its effects on human health (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- DEQ
  - Air pollution control equipment tax exemption
  - Alternative fuel programs
  - Clean Air Partners
  - Office of Pollution Prevention outreach, training and publications
  - Project XL
  - Small Business Assistance Program
- HRT regional education
- MME energy division program – incentives for renewables
- Ridefinders
- Traffix

**2. Regulation**

- DEQ
- Air check Virginia
- Air permits
- Air toxics program
- EPA non-attainment areas
- SARA Title III
- State Implementation Plan (SIP) Process
- Transportation Improvement Plan (TIP) Process
- Toxics Release Inventory

**MISSING ELEMENTS:**

**1. Outreach**

- Develop ozone alert/awareness program in tidewater
- Enhance public education on subject of air quality

**2. Regulation**

N/A

### 3. Monitoring

### 4. Planning/coordination

- Clean Air Partners
- ECOS
- State Implementation Plan (SIP) Process
- Transportation Improvement Plan (TIP) Process
- Regional Transportation Planning
- SAMI Regional Haze Program
- STAPPA- ALAPCO
- VDOT local air quality requirement for planning

### 5. Research

N/A

### 3. Authority

- Develop regulations for “mobile source” pollution

### 4. Monitoring

- Establish statewide baseline of pollutant levels

### 5. Planning/coordination

- Develop state energy conservation plan
- Coordinate state management efforts with local planning process

### 6. Research

- Quantify ecosystem impacts to support implementation of regulatory controls

### 7. Definition of management targets

**Strategic Goal B:** Air quality at “safe” levels for ecosystem effects

**Strategic Goal B Measures:**

- Reduction in pollutants released to the air (NO<sub>x</sub> and VOC)
- Decrease in acid rain deposition days
- Reduction in size of ozone maintenance for non-attainment areas

**Intermediate Goals:**

1. Change public understanding/ behavior
2. Identify safe levels for ecosystem health
3. Promulgate regulations and incentives for all industries to keep emissions to a safe minimum

**Intermediate Goal Measures:**

- Decrease in acid rain deposition days
- Reduction in size of ozone maintenance for non-attainment areas
- Increase in percentage of reach showing improved understanding of air quality and its effects on ecosystem health (via survey)

## **EXISTING PROGRAMS:**

### **1. Outreach**

- DEQ
  - Air pollution control equipment tax exemption
  - Alternative fuel programs
  - Clean Air Partners
  - Office of Pollution Prevention outreach, training and publications
  - Project XL
  - Small Business Assistance Program
- HRT regional education
- MME energy division program – incentives for renewables
- Ridefinders
- Traffix

### **2. Regulation**

- DEQ
- Air check Virginia
- Air permits
- Air toxics program
- EPA non-attainment areas
- SARA Title III
- State Implementation Plan (SIP) Process
- Transportation Improvement Plan (TIP) Process
- Toxics Release Inventory

N/A

### **3. Monitoring**

### **4. Planning/coordination**

- Clean Air Partners
- ECOS
- State Implementation Plan State (SIP) Process
- Transportation Improvement Plan (TIP) Process
- Regional Transportation Planning

## **MISSING ELEMENTS:**

### **1. Outreach**

- Identify hazards/potential hazards of “area source pollution” (lawn mowers, hairspray, etc.)
- Enhance public education on subject of air quality

### **2. Regulation**

### **3. Authority**

- Develop regulations for “mobile source” pollution

### **4. Monitoring**

- Establish statewide baseline of pollutant levels

### **5. Planning/coordination**

- Develop state energy conservation plan
- Coordinate state management efforts with local planning process
- Identify deposition rates and modify efforts to reduce nutrient inputs to surface waters

- SAMI Regional Haze Program
- STAPPA- ALAPCO
- VDOT local air quality requirement for planning

**5. Research**

**6. Research**

- Quantify ecosystem impacts to support implementation of regulatory controls

**7. Definition of management targets**

N/A

**REACH**

Public  
 Regulatory  
 Developers  
 Real Estate Agents  
 Landowners  
 Corporations  
 Watershed Associations

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Air flow patterns  
 Politics  
 Financial constraints  
 Public awareness  
 Economic development opportunities  
 Weather  
 Fire  
 Wildfires

**5. To protect the public from contaminated seafood**

**Strategic Goal A:** Prevention of contaminated seafood/beds

**Strategic Goal A Measures:**

- Reduction in number of necessary shellfish bed closures
- Reduction in number of necessary fish consumption advisories

**Intermediate Goals:**

1. Change public understanding/ behavior regarding PS and NPS pollution
1. Identify safe levels in water connected to body burdens (bio-accumulation and magnification)
2. Reduce toxics and nutrient levels to “safe” levels
3. Cleanup of beds/ waters where appropriate

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of PS and NPS pollution and its effects on seafood (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Boater Education – Coast Guard
- NPS TMDL effort
- VDH Shellfish Sanitation (National Shellfish Sanitation Program - NSSP)
- Oyster Gardening program
- Oyster Heritage program

**2. Regulation**

- Local Zoning
- TMDLs
- VMRC Enforcement
- DEQ water permits
- VDH sanitation permits, condemnations and restrictions

N/A

**3. Monitoring**

- Ches Bay monitoring – DEQ

**MISSING ELEMENTS:**

**1. Outreach**

**2. Regulation**

- Required use of pump-out facilities
- Implement no discharge zones
- VDH complete effort to identify/repair/replace failing septic systems
- Identify and enforce areas unsuitable for septic system placement
- Full enforcement of 5 year septic pump-out requirement
- Full enforcement of the 100' buffer/increase riparian buffers
- VDH/DEQ complete and enforce source water protection plans

**3. Authority**

**4. Monitoring**

- Expand monitoring of environment and

- Seawater sampling – VDH
- Shoreline survey - VDH

harvested seafood

**4. Planning/coordination**

- Clam Management Advisory Committee (VMRC)
- Coastal Non-point Program
- Commercial Fishing Advisory Board
- Shellfish Management Advisory Committee (VMRC)

**5. Planning/coordination**

- Develop toxin-dependent restoration/clean-up/project mapping

**5. Research**

- Comprehensive Coastal Inventory - VIMS

**6. Research**

N/A

**7. Definition of management targets**

**Strategic Goal B:** Effective public notification program for contaminated beds and seafood

**Strategic Goal B Measures:**

- Decrease in harvesting in contaminated beds (to 0)
- Decrease in illnesses due to ingestion of contaminated seafood (to 0)

**Intermediate Goals:**

1. Change public understanding/ behavior regarding PS and NPS pollution
2. Identify safe levels in water connected to body burdens (bio-accumulation and magnification)
3. Reduce toxics and nutrient levels to “safe” levels
4. Cleanup of beds/ waters where appropriate

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of PS and NPS pollution and its effects on seafood (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Shellfish Closure Signs – VMRC/VDH
- VDH Advisories
- Oyster Gardening program
- Oyster Heritage program

**MISSING ELEMENTS:**

**1. Outreach**

- Expand education on harvesting bans

**2. Regulation**

- EPA Human Health Criteria
- Oyster Certification
- VDH classification

**2. Regulation**



- VMRC Enforcement

N/A

### 3. Monitoring

- Ches. Bay monitoring – DEQ
- Seawater sampling – VDH
- Shoreline survey – VDH
- VDH toxic phytoplankton, shellfish toxins, pfiisteria cohort studies
- DEQ - toxic phytoplankton

### 4. Planning/coordination

### 5. Research

N/A

### 3. Authority

### 4. Monitoring

- Expand monitoring of environment and harvested seafood

### 5. Planning/coordination

### 6. Research

- Develop technology to identify and detect bio-toxins rapidly and inexpensively for closures/warnings

### 7. Definition of management targets

**Strategic Goal C:** Effective seafood inspection program

**Strategic Goal C Measures:**

- Decrease in number of illnesses related to ingestion of contaminated seafood (to 0)

**Intermediate Goals:**

1. Establish safe criteria for consumption of seafood with man-made and naturally occurring toxics and other biohazards
2. Conduct comprehensive and continuous monitoring of all facilities from dockside to retail

**Intermediate Goal Measures:**

- Increase in monitoring

**EXISTING PROGRAMS:**

#### 1. Outreach

#### 2. Regulation

- EPA Human Health Criteria
- FDA inspection
- VMRC Enforcement

N/A

**MISSING ELEMENTS:**

#### 1. Outreach

#### 2. Regulation

#### 3. Authority

- Establish EPA criteria for safe levels of

all toxins

**3. Monitoring**

**4. Monitoring**

- Expand monitoring of environment and harvested seafood

**4. Planning/coordination**

**5. Planning/coordination**

**5. Research**

**6. Research**

- Develop technology to identify and detect bio-toxins rapidly and inexpensively for closures/warnings

N/A

**7. Definition of management targets**

**REACH**

General public

Point source dischargers

Producers/users/owners of toxics

Agriculture producers

Septic tank users

Fishers

Seafood processors

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

*None identified*

## **6. To preserve, increase and protect wetlands**

**Strategic Goal A:** No net loss in wetland acreage and function

**Strategic Goal A Measures:**

- Decrease in acres lost through permitting (to 0)

**Intermediate Goals:**

1. Evaluate threats to the resource and manage for them
2. Change public understanding of wetland values
3. Minimize permitted losses
4. 100% compensation for both acreage and function

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of wetland functions and values (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Citizen Watershed groups
- VIMS Wetlands Education Program
- Wetlands Reserve Program

**2. Regulation**

- Local Zoning
- CBPA – preserving RPA wetlands
- Non-tidal Wetland Permit – DEQ
- Tidal Wetlands Act (VMRC/ local government)
- VMRC Enforcement
- Water withdrawal permits (DEQ)

N/A

**3. Monitoring**

- CBP Status and Trends
- Restoration Tracking- DGIF
- Tidal Marsh Inventories
- Permit impacts - VIMS

**4. Planning/coordination**

- CBP Environmental Endpoints
- Habitat Management Advisory Committee – VMRC

**MISSING ELEMENTS**

**1. Outreach**

**2. Regulation**

- Require complete compensation for all permitted impacts on tidal and non-tidal wetlands

**3. Authority**

- VMRC “environmental review”, not just procedural review –clarify “guidelines”

**4. Monitoring**

- Inventory/track status and trends, including natural change/loss, and restoration activities

**5. Planning/coordination**

- “Plan” to address natural wetland loss(sea level rise, barriers to inland wetland migration, water supply)

- Integrate wetland management with terrestrial system management
- Expand funding for acquisition of wetlands and adjacent lands

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

**6. Research**

**7. Definition of management targets**

- Develop management policy addressing wetland change due to sea level rise

N/A

**Strategic Goal B:** Increase in the amount of wetlands preserved

**Strategic Goal B Measures:**

- Increase in area of voluntary restoration/ creation

**Intermediate Goals:**

1. Change public understanding of wetland values
2. Evaluate threats to the resource
3. Identify wetlands to be acquired
4. Acquisition of wetland property

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of wetland functions and values (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- CBC Riparian Buffer Program
- Citizen Watershed groups
- Conservation Easements (state/ NGOs)
- Ducks Unlimited Programs
- DCR
  - Conservation Reserve Enhancement Program
  - Natural Area Preserves
  - Virginia Land Conservation Foundation
- DGIF
  - Habitat Enhancement

**MISSING ELEMENTS**

**1. Outreach**

- Expand education of landowners regarding tax incentives for voluntary protection of wetlands

- Wetland Restoration
- Restoration effort tracking and targeting
- ERP Restoration Program
- VIMS Wetlands Education Program
- Wetlands Reserve Program

**2. Regulation**

- Tidal wetlands act (VMRC)
- Non-tidal wetlands act (DEQ)

N/A

**3. Monitoring**

- CBP Status and Trends
- Tidal Marsh Inventories

**4. Planning/coordination**

- CBP Environmental Endpoints
- Elizabeth River Action Plan
- Habitat Management Advisory Committee – VMRC

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

N/A

**2. Regulation**

**3. Authority**

**4. Monitoring**

- Inventory/track status and trends, including natural change/loss and
- Restoration activities

**5. Planning/coordination**

- “Plan” to address natural wetland loss(sea level rise, barriers to inland wetland migration, water supply)
- Integrate wetland management with terrestrial system management
- Expand funding for acquisition of wetlands and adjacent lands

**6. Research**

**7. Definition of management targets**

**Strategic Goal C:** Increase in the amount of wetlands created or restored to original function and extent

**Strategic Goal C Measures:**

- Increase in acreage preserved

**Intermediate Goals:**

1. Change public understanding of wetland values

- 2. Increase voluntary wetland restoration/protection
- 3. Increase government protection and restoration efforts

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of wetland functions and values (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- CBC Habitat Restoration
- CBC Riparian Buffer Program
- Citizen Watershed groups
- Ducks Unlimited Programs
- DCR
  - Conservation Reserve Enhancement Program
  - Natural Area Preserves
  - Virginia Land Conservation Foundation
- DGIF
  - Habitat Enhancement
  - Wetland Restoration
  - Restoration effort tracking and targeting
- ERP Restoration Program
- VIMS Wetlands Education Program
- Wetlands Reserve Program

**2. Regulation**

N/A

**3. Monitoring**

- CBP Status and Trends
- Restoration Tracking- DGIF
- Tidal Marsh Inventories

**4. Planning/coordination**

- Elizabeth River Action Plan
- Habitat Management Advisory Committee – VMRC
- Restoration Planning - DGIF

**MISSING ELEMENTS**

**1. Outreach**

**2. Regulation**

**3. Authority**

**4. Monitoring**

- Inventory/track status and trends, including natural change/loss and restoration activities

**5. Planning/coordination**

- “Plan” to address natural wetland loss(sea level rise, barriers to inland wetland migration, water supply)
- Integrate wetland management with terrestrial system management

## 5. Research

- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

N/A

## 6. Research

## 7. Definition of management targets

### **REACH**

Wetland owners:

Developers

Residents

Businesses

Public Agencies

Adjacent waterway users

Building contractors

Government decision-makers

General Public

Wetland Boards

DEQ

VMRC

### **Reach measure:**

- Proportion of reach participating in outreach programs

### **CONTEXT:**

Sea level rise

Weather

Economy/ land value

Increasing coastal population

Property rights

Invasive species

Erosion

Limited funding

## **7. To protect and improve submerged land habitat**

**Strategic Goal A:** No degradation of existing submerged land habitat

**Strategic Goal A Measures:**

- Decrease in area impacted through permitting process (to 0)

**Intermediate Goals:**

1. Improve public understanding of submerged land habitat value
2. Identify and define sensitive areas
3. Minimize dredging and other disruptive activities in sensitive areas
4. Improve water clarity for SAV growth

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of submerged land habitat value (via survey)
- Decrease in sensitive area dredging (to 0)
- Increased percentage of submerged land inventoried and classified
- Increase in proportion of Tier 1 goal vegetated (to 100%)

**EXISTING PROGRAMS:**

**1. Outreach**

- Beneficial use of dredge material
- Bay Program website for benthic resources
- Baylor Grounds maps
- Citizen Watershed groups
- Clean Marina Program
- SAV maps –VIMS
- Virginia Oyster Heritage Program
- Oyster Gardening Program

**2. Regulation**

- Marine Protected Areas -VMRC
- Subaqueous Lands Permit
- VMRC Enforcement
- VMRC permitting for transplanting SAV – monitoring and tracking

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Enhance NPS education on the importance of reducing total suspended solids.
  - Stormwater
  - Erosion & sediment control
  - Runoff from roads
  - Agriculture
- Improve marina siting capabilities at the local level.

**2. Regulation**

- Remove impacts from destructive fishing activities such as dredging crabs.

**3. Authority**

- Authorize establishment of no wake zones for ecological reasons (this exists for habitat impacts and is a reason for Virginia receiving Coastal NPS Program approval)
- Shallow water use designations



**3. Monitoring**

- Permit tracking – VIMS
- Trawl Survey – live bottom type – VIMS
- SAV program – VIMS

**4. Monitoring**

- Establish/maintain inventory of submerged bottom types, sensitive areas, shallow water bathymetry, MPA’s, aquaculture activities
- Develop classification of habitat types in the Bay

**4. Planning/coordination**

- CBP Environmental Endpoints
- Habitat Management Advisory Committee – VMRC
- Submerged Minerals Management Plan

**5. Planning/coordination**

- Coordinate management of riparian lands with management of shallow submerged lands

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

**6. Research**

- Expand knowledge of values of submerged land habitat

**7. Definition of management targets**

N/A

**Strategic Goal B:** Increased preservation of existing submerged land habitat

**Strategic Goal B Measures:**

- Increase in area of submerged lands designated impact restricted areas (easements and zoning)

**Intermediate Goals:**

1. Change public understanding of submerged land habitat value
2. Preserve areas identified as important habitat - MPA’s
3. Enforce regulations to protect benthic habitat, such as no wake zones

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of submerged land habitat values (via survey)
- Increase in percent of area identified as important designated as Marine Protected Areas (to 100%)

**EXISTING PROGRAMS:**

**1. Outreach**

- Bay Program website for benthic resources
- Baylor Grounds maps
- Citizen Watershed groups
- Habitat Enhancement –
- SAV maps –VIMS

**MISSING ELEMENTS:**

**1. Outreach**

- Enhance NPS education on the importance of reducing total suspended solids.
  - Stormwater
  - Erosion & sediment control

- Virginia Oyster Heritage Program
- Oyster Gardening Program

- Runoff from roads
- Agriculture

**2. Regulation**

- Marine Protected Areas -VMRC
- VMRC Enforcement

**2. Regulation**

- Remove impacts from destructive fishing activities such as dredging crabs.

N/A

**3. Authority**

- Authorize establishment of no wake zones for ecological reasons (this exists for habitat impacts and is a reason for Virginia receiving Coastal NPS Program approval)
- Shallow water use designations

**3. Monitoring**

- VIMS SAV Study
- Crab dredge survey

**4. Monitoring**

- Establish/maintain inventory of submerged bottom types, sensitive areas, shallow water bathymetry, MPA's, aquaculture activities
- Develop classification of habitat types in the Bay

**4. Planning/coordination**

- CBP Environmental Endpoints
- Elizabeth River Action Plan
- Habitat Management Advisory Committee – VMRC

**5. Planning/coordination**

- Coordinate management of riparian lands with management of shallow submerged lands

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR
- SAV studies – VIMS
- VIMS oyster program

**6. Research**

- Expand knowledge of values of submerged land habitat

N/A

**7. Definition of management targets**

**Strategic Goal C:** Increased restoration of benthic habitat

**Strategic Goal C Measures:**

- Area of oyster restoration
- Area of SAV restoration

**Intermediate Goals:**

1. Change public understanding of submerged land habitat
2. Implement programs to restore SAV beds, reefs, etc

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of submerged land habitat values (via survey)
- Increase in the number of restoration programs
- Increase in funding for restoration programs

**EXISTING PROGRAMS:**

**1. Outreach**

- Beneficial use of dredge material
- Bay Program website for benthic resources
- Baylor Grounds maps
- CBC Habitat Restoration
- Citizen Watershed groups
- ERP Restoration Program
- Habitat Enhancement – DGIF
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- SAV maps –VIMS
- SAV Planting- CBF & VIMS
- Virginia Oyster Heritage Program
- Oyster Gardening Program

**2. Regulation**

N/A

**3. Monitoring**

- VIMS SAV Study

**4. Planning/coordination**

**MISSING ELEMENTS:**

**1. Outreach**

- Enhance NPS education on the importance of reducing total suspended solids.
  - Stormwater
  - Erosion & sediment control
  - Runoff from roads
  - Agriculture

**2. Regulation**

- Shallow water use designations

**3. Authority**

**4. Monitoring**

- Establish/maintain inventory of submerged bottom types, sensitive areas, shallow water bathymetry, MPA's, aquaculture activities
- Develop classification of habitat types in the Bay
- Track and monitor success/failure of restored SAV's and oyster reefs

**5. Planning/coordination**

- CBP Environmental Endpoints
- Elizabeth River Action Plan
- Habitat Management Advisory Committee – VMRC
- Oyster Restoration Plan
- Submerged Minerals Management Plan
- Ecoregional plan for Chesapeake Bay Lowlands – The Nature Conservancy

- Coordinate management of riparian lands with management of shallow submerged lands
- Develop comprehensive restoration effort/plan for submerged lands

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR
- SAV restoration research - VIMS

**6. Research**

- Expand knowledge of values of submerged land habitat

**7. Definition of management targets**

N/A

**REACH**

Dredgers  
 Boaters  
 Commercial fishermen  
 Waterfront property owners  
 Government decision makers at all levels  
 Public

**Reach measure:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Increasing waterway use – recreational and commercial  
 Continues prevalence of oyster diseases  
 Invasive species  
 Sedimentation

**8. Minimize damage to the productivity and diversity of the marine environment resulting from the disruption of finfish and shellfish population balances**

**Strategic Goal A:** Manage all fish and shellfish populations such that ecosystem integrity is maintained

**Strategic Goal A Measures:**

- Sustainable wild harvests (no trends)

**Intermediate Goals:**

1. Change public understanding / attitudes towards fishing pressures and the importance of ecosystem integrity
2. Bottom-up model for productivity, starting with water quality/ sea grass
3. Gain scientific understanding of comprehensive ecosystem interactions
4. Implement changes in policy and management from the single-marketed-species approach to an ecosystem approach, including EFH/MPA which account for all stages of the life cycle of exploited species
5. Restoration of EFH and stocks
6. Manage fisheries takes to an OSY ecosystem approach

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of fishing pressures and the importance of ecosystem integrity (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Boater Education – Coast Guard
- CBC Habitat Restoration
- CBC Riparian Buffer Program
- Citizen Watershed groups
- Habitat Enhancement – DGIF
- Saltwater Sport Fishing Tournament
- Sport Fishing Restoration- Dingell-Johnson VMRC/DGIF

**2. Regulation**

- DGIF
- Fisheries Regulations
- VMRC
  - Clam Broodstock Areas
  - Fisheries Regulations
  - Marine Protected Areas
  - Enforcement

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Boating groups such as Boat US.
- Commercial fisheries education

**2. Regulation**

- Shallow water use designations
- Remove impacts from destructive fishing activities such as dredging crabs.
- Disallow out of state commercial harvesters to work Virginia waters.

**3. Authority**

- Authorize establishment of Marine Protected Areas

### 3. Monitoring

- VMRC Stock Assessment
- VIMS trawl survey

### 4. Planning/coordination

- Atlantic States Marine Fisheries Plans
- Blue Crab Management Advisory Committee (VMRC)
- CBC Blue Crab Management
- CBP Environmental Endpoints
- Commercial Fishing Advisory Board
- Finfish Management Advisory Committee (VMRC)
- Oyster Restoration Plan CBF
- Recreational Fishing Advisory Board (VMRC)
- SAV Restoration - CBF

### 5. Research

- CBSAC funded projects

N/A

### 4. Monitoring

- Sea Grant Marina Advisory Service

### 5. Planning/coordination

- Establish forum for dialogue on linkages (e.g. land-use, water quality, fisheries)

### 6. Research

- Develop understanding of multi-species interactions

### 7. Definition of management targets

- Link ecosystem goals with fisheries goals
- Define “disruption”
- Establish management for bottom-up control of food-web

### REACH

Recreational fishers  
Harvesters  
Managers  
Policy makers

### Reach measure:

- Proportion of reach participating in outreach programs

### CONTEXT

Weather  
Development (habitat impacts)  
Enforcement (illegal harvests)  
Additional fisheries data  
User group conflicts  
Unbalanced allocation due to lack of data  
Differences in philosophy on what constitutes proper management

## **9. To reduce the adverse effects of suspended solids and sedimentation on coastal aquatic habitats**

**Strategic Goal A:** Sediment loads at “safe” (negligible impact) levels

### **Strategic Goal A Measures:**

- Reduction in total suspended solids
- Decrease in percentage of aquatic habitat impaired by suspended solids

### **Intermediate Goals:**

1. Change public understanding of sedimentation in waterways/change behavior
2. Establish regulatory and voluntary controls and “safe levels” for runoff and waterways
3. Conduct appropriate land stewardship for runoff management at “safe” levels

### **Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of sedimentation in waterways (via survey)
- Decrease in number of E & S violations
- Increase in number of BMPs implemented
- Increase in number of miles of protected shoreline in natural geomorphic condition
- Increase in number of miles of restored stream (geomorphic)
- Compliance of dredging activities to time of year restrictions
- Miles of riparian buffer restoration

## **EXISTING PROGRAMS:**

### **1. Outreach**

- Ag cost-share program
- Ag. BMP’s
- Alliance for Chesapeake Bay (fed. funds)
- CBC Habitat Restoration
- CBC Riparian Buffer Program
- CBF education (pass-through of funds)
- CBLAD education
- CBLAD GIS
- CBLAD Technical Assistance Program
- Citizen Watershed groups
- Clean Marina Program
- Conservation Reserve Enhancement Program –DCR
- ERP Restoration Program
- SEAS –DCR
- DCR NPS Education
- DCR Cooperative Watershed Initiative
- Water quality improvement fund

## **MISSING ELEMENTS:**

### **1. Outreach**

- Expand funding and technical assistance for Ag cost-share
- Improve compliance with Forest BMP voluntary program
- Promote buffer maintenance/restoration
- Promote environmentally friendly methods of erosion control
- Expand programs teaching/advocating use of porous pavement, etc.
- Expand E&S public education, local government training and certification effort
- Improve local government compliance with E&S program
- Provide funding for full implementation of tributary strategies

- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative

## 2. Regulation

- Bay Act Programs
- Dredging permits
- E & S – DCR/ local
- Local Zoning
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- TMDLs (point & nonpoint)
- DEQ VPDES permits
- 305(b) reports & 303(d) lists

N/A

## 3. Monitoring

- Alliance citizen monitoring
  - CBNERRS monitoring
  - Ches Bay monitoring – DEQ
  - Polecat creek monitoring
- USGS water quality monitoring

## 4. Planning/coordination

- CBP Environmental Endpoints
- Coastal Non-point Program –DCR
- Elizabeth River Action Plan
- Elizabeth River/ Lynnhaven River restoration studies
- DCR NPS pollution potential assessment

## 2. Regulation

- Improve standards for disposal of dredge spoil
- Enhance enforcement of existing standards (e.g., MS19 E&S standard to minimize downstream erosion, RPA)
- DCR/VDACS/CBLAD - enforce implementation of soil and water conservation plans
- Mandate statewide stormwater ordinance development & implementation

## 3. Authority

- Develop programs to address sediment resuspension by dredging and commercial/recreational boat traffic
- Expand requirements for settling ponds and requirements for maintaining the ponds once built
- Mandate stormwater ordinance implementation
- Develop and expand urban nutrient management effort
- Reduce development in floodplains

## 4. Monitoring

- Increase citizen monitoring and integrate with DEQ water quality program
- Develop monitoring program that coincides with BMP installation
- Expand use of biological/living resource indicators

## 5. Planning/coordination

- Establish state leadership in development of standards
- Provide funding for local implementation of programs



- DCR Cooperative Watershed Initiative
- 305(b) reports & 303(d) lists
- DCR NPS Pollution Management Plan

#### 5. Research

- CBP Water Quality Models
- Comprehensive Coastal Inventory - VIMS
- Shoreline program - VIMS

#### 6. Research

- Develop sediment budgets for Virginia waters
- Increase understanding of climactic change impacts (sea level rise, increased shoreline erosion/sedimentation, increased precipitation and runoff)

#### 7. Definition of management targets

- Define "safe"

N/A

**Strategic Goal B:** Aquatic life showing no significant negative effects from anthropogenic sedimentation

#### Strategic Goal B Measures:

- Decrease in area characterized by a depressed Index of Benthic Integrity

#### Intermediate Goals:

1. Change public understanding of sedimentation effects on ecosystems/change in behavior
2. Quantify sedimentation levels that affect organisms/ reduction in loads to this point

#### Intermediate Goal Measures:

- Increase in percentage of reach showing improved understanding of sedimentation in waterways (via survey)

#### EXISTING PROGRAMS:

##### 1. Outreach

- Ag cost-share program
- Ag. BMP's
- Alliance for Cheapeake Bay (fed. funds)
- CBC Habitat Restoration
- CBC Riparian Buffer Program
- CBF education (pass-through of funds)
- CBLAD education
- CBLAD GIS
- CBLAD Technical Assistance Program
- Citizen Watershed groups
- Clean Marina Program
- Conservation Reserve Enhancement Program –DCR
- ERP Restoration Program

#### MISSING ELEMENTS:

##### 1. Outreach

- SEAS –DCR
- DCR NPS Education
- DCR Cooperative Watershed Initiative
- Water quality improvement fund
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative

## 2. Regulation

- Bay Act Programs
- Dredging permits
- E & S – DCR/ local
- Local Zoning
- Stormwater Management Act Programs- DCR/ CBLAD/ DEQ
- TMDL (point & nonpoint)
- DEQ VPDES permits
- 305(b) reports & 303(d) lists

N/A

## 3. Monitoring

- Alliance citizen monitoring
  - CBNERRS monitoring
  - Ches Bay monitoring – DEQ
  - Polecat creek monitoring
- USGS water quality monitoring

## 4. Planning/coordination

- CBP Environmental Endpoints
- Coastal Non-point Program –DCR
- Elizabeth River Action Plan
- Elizabeth River/Lynnhaven River restoration studies

## 5. Research

- CBP Water Quality Models
- Comprehensive Coastal Inventory - VIMS

N/A

## 2. Regulation

## 3. Authority

## 4. Monitoring

- Increase in use of biological indicators
- Increase citizen monitoring and integrate with DEQ water quality program

## 5. Planning/coordination

- Establish state leadership in development of standards

## 6. Research

- Increase understanding of climactic change impacts (sea level rise, increased shoreline erosion/sedimentation, increased precipitation and runoff)

## 7. Definition of management targets

**REACH**

Land owner / occupant

Industry/ Municipal dischargers

Airshed dischargers

Water recreational users

Government decision makers

farmers

builders (contractors)

**Reach measure:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Environmental/physical conditions

Status of economy

Access

Property rights

## **10. Preserve and improve natural communities and preserve rare species**

**Strategic Goal A:** No degradation of existing natural communities and rare species habitat

**Strategic Goal A Measures:**

- No change in area extent of identified natural communities and rare species habitat

**Intermediate Goals:**

1. Change public understanding of natural communities and rare species habitat values/change behavior
2. Identify threats
3. Identify important natural communities/rare species habitat
4. Minimize construction/ disturbance in sensitive areas

**Intermediate Goal Measures:**

- Increase in area inventoried and classified for natural communities and rare species habitat
- Decrease (to 0) impacts on identified sensitive areas
- Increase in percent of local comp plans with conservation elements
- Increase in percentage of reach showing improved understanding of natural communities and rare species habitat values (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- CBC Riparian Buffer Program
- Citizen Watershed groups
- Coastal Program Land Acquisition
- Conservation Easements (state/ NGOs)
- Conservation Reserve Enhancement Program –DCR
- Local land holdings
- National Park Service
- Natural Area Preserves – DCR
- Natural Area Registry Program - DCR
- Non-profit land acquisitions (e.g., The Nature Conservancy)
- NPS education - DCR
- State Park System - DCR
- Virginia Land Conservation Foundation
- Virginia Outdoors Program
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative
- Wetlands Reserve Program

**2. Regulation**

- Army Corps of Engineers land management
- Coastal Primary Sand Dune Permits –

**MISSING ELEMENTS:**

**1. Outreach**

- Education of local governments

**2. Regulation**

VMRC

- DGIF Exotic Species Permits
- Local Zoning
- Marine Protected Areas –VMRC
- Nontidal Wetland Permit – DEQ
- SAMPS - CZMP
- Tidal Wetland Permits - VMRC
- VMRC Enforcement

N/A

**3. Monitoring**

- VIMS SAV study

**4. Planning/coordination**

- CBP Environmental Endpoints

**5. Research**

- Biota of Virginia (DGIF)
- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

N/A

**3. Authority**

**4. Monitoring**

- Identify sensitive areas
- Develop invertebrate inventories for many natural communities
- Map/define natural communities and rare species (abundance and habitat)
- Develop a status system for types of communities (like RTE) to lead to better protection of natural communities

**5. Planning/coordination**

- Develop prioritization of natural communities and rare species habitats to preserve

**6. Research**

- Identify habitat requirements of rare species

**7. Definition of management targets**

- 

**Strategic Goal B:** No additional loss /increase in populations of rare species

**Strategic Goal B Measures:**

- Increase in population inventory numbers

**Intermediate Goals:**

1. Change public understanding of rare species /change behavior
2. Identify rare species and locate populations / track/measure

3. Protect and restore rare species populations

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of rare species (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Agricultural Stewardship Program
- CBC Riparian Buffer Program
- Citizen Watershed groups
- Coastal Program Land Acquisition
- Conservation Easements (state/ NGOs)
- Conservation Reserve Enhancement Program –DCR
- Fish Stocking -DGIF
- Local land holdings
- National Park Service
- Natural Area Preserves – DCR
- Natural Area Registry Program - DCR
- Non-profit land acquisitions (e.g., The Nature Conservancy)
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- SAV Planting
- State Park System - DCR
- Virginia Land Conservation Foundation
- Virginia Outdoors Program
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative
- Wetlands Reserve Program

**2. Regulation**

- DGIF Non-game Program
- VDACS Threatened and Endangered Plant and Insect Program
- VMRC Enforcement
- Local Zoning/comp plan process

N/A

**3. Monitoring**

**MISSING ELEMENTS:**

**1. Outreach**

- Education of local governments

**2. Regulation**

**3. Authority**

**4. Monitoring**

- Identify sensitive areas
- Map/define natural communities and rare species (abundance and habitat)

**4. Planning/coordination**

- CBP Environmental Endpoints
- Finfish Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Recreational Fishing Advisory Board (VMRC)

**5. Planning/coordination**

**5. Research**

- Biota of Virginia (DGIF)
- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

**6. Research**

**7. Definition of management targets**

N/A

**Strategic Goal C:** Increased protection of existing natural communities/rare species habitat

**Strategic Goal C Measures:**

- Increase in area of land preserved for identified natural communities and rare species habitat

**Intermediate Goals:**

1. Change public understanding of natural communities/ rare species habitat value/ change behavior
2. Identify important natural communities/ rare species habitat
3. Protect existing natural communities/ rare species habitat

**Intermediate Goal Measures:**

- Increase in percentage of area inventoried and classified for natural communities and rare species habitat
- Increase in percentage of reach showing improved understanding of natural communities and rare species habitat (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Agricultural Stewardship Program
- CBC Habitat Restoration
- CBC Riparian Buffer Program
- Citizen Watershed groups
- Coastal Program Land Acquisition
- Conservation Easements (state/ NGOs)
- Conservation Reserve Enhancement Program –DCR
- Ducks Unlimited Programs

**MISSING ELEMENTS:**

**1. Outreach**

- Education of local governments

- ERP Restoration Program
- Local land holdings
- National Park Service
- Natural Area Preserves – DCR
- Natural Area Registry Program - DCR
- Non-profit land acquisitions (e.g., The Nature Conservancy)
- NPS education - DCR
- State Park System - DCR
- Virginia Land Conservation Foundation
- Virginia Outdoors Program
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative
- Wetlands Reserve Program

## 2. Regulation

- Marine Protected Areas –VMRC
- SAMPS – CZMP
- Local Zoning/comp plan process

N/A

## 3. Monitoring

- Restoration tracking- DGIF

## 4. Planning/coordination

- Chesapeake Bay Lowlands Ecoregional Plan – The Nature Conservancy
- Elizabeth River Action Plan

## 5. Research

- Biota of Virginia (DGIF)
- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

## 2. Regulation

## 3. Authority

## 4. Monitoring

- Identify sensitive areas
- Map/define natural communities and rare species (abundance and habitat)
- Develop a status system for types of communities (like RTE) to lead to better protection of natural communities

## 5. Planning/coordination

- Expand acquisition and protection of lands holding these habitats
- Develop prioritization of rare species populations to preserve
- Develop prioritization of natural communities and rare species habitats to preserve

## 6. Research

- Habitat requirements of rare species



N/A

## 7. Definition of management targets

**Strategic Goal D:** Increased restoration of natural communities/rare species habitat

**Strategic Goal D Measures:**

- Increased number of restoration projects
- Increased funding for restoration projects

**Intermediate Goals:**

1. Change public understanding of natural communities/rare species habitat value/ change behavior
2. Identify natural communities and rare species habitat in need of restoration
3. Restore natural communities and rare species

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of natural communities and rare species habitat value (via survey)
- Increase in percentage of area identified and inventoried for restoration

**EXISTING PROGRAMS:**

**1. Outreach**

- Agricultural Stewardship Program
- CBC Habitat Restoration
- CBC Riparian Buffer Program
- Citizen Watershed groups
- Coastal Program Land Acquisition
- Conservation Easements (state/ NGOs)
- Conservation Reserve Enhancement Program –DCR
- Ducks Unlimited Programs
- ERP Restoration Program
- Farm Pond Management –DGIF
- Fish Stocking -DGIF
- National Park Service
- Natural Area Preserves – DCR
- Natural Area Registry Program - DCR
- Non-profit land acquisitions (e.g., The Nature Conservancy)
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- SAV Planting
- State Park System - DCR
- Virginia Land Conservation Foundation
- Virginia Outdoors Program
- Water Quality Programs – Forestry
  - Riparian Forest Buffer Initiative

**MISSING ELEMENTS:**

**1. Outreach**

- Education of local governments

- Wetlands Reserve Program
- Wetland Restoration -DGIF

**2. Regulation**

- Army Corps of Engineers land management
- DGIF Non-game Program
- SAMPS - CZMP
- VDACS Threatened and Endangered Plant and Insect Program

N/A

**3. Monitoring**

- Restoration tracking- DGIF

**4. Planning/coordination**

- Chesapeake Bay Lowlands Ecoregional Plan – The Nature Conservancy
- Elizabeth River Action Plan
- Oyster Restoration Plan
- Restoration Planning – DGIF

**5. Research**

- Biota of Virginia (DGIF)
- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR

N/A

**REACH**

all landowners  
 local decision-makers  
 legislators  
 recreational users of natural communities

**2. Regulation**

**3. Authority**

**4. Monitoring**

- Identify sensitive areas
- Develop invertebrate inventories for many natural communities
- Map/define natural communities and rare species (abundance and habitat)
- Develop a status system for types of communities (like RTE) to lead to better protection of natural communities

**5. Planning/coordination**

**6. Research**

- Identify habitat requirements of rare species

**7. Definition of management targets**

developers and contractors  
public

**Reach measure:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Rapid conversion of natural lands

Increasing population

Increasing disconnect between humans and the natural environment

Invasive species

## **11. Conserve and improve coastal sand dune and beach systems**

**Strategic Goal A:** No net loss in coastal sand dune systems extent

### **Strategic Goal A Measures:**

- Decrease in dune area impacted through the permit process
- Decrease in dune area impacted through trampling/trespassing

### **Intermediate Goals:**

1. Change public understanding of sand dune values / change behavior (don't build on or walk on dunes)
2. Identify existing systems
3. Identify/ minimize sources of losses

### **Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of sand dune values (via survey)
- Increase in miles of shoreline inventoried for dunes
- Increase in number of dune acres preserved

### **EXISTING PROGRAMS:**

#### **1. Outreach**

- Conservation Easements (state/ NGOs)
- Local gov't initiatives (e.g., sand fencing, Christmas trees)
- Natural Area Preserves – DCR
- SEAS beach stabilization programs
- Virginia Land Conservation Foundation

#### **2. Regulation**

- Coastal Primary Sand Dune Permits – VMRC
- Barrier Islands Policy
- Local Zoning
- Marine Protected Areas –VMRC
- VMRC Enforcement

N/A

#### **3. Monitoring**

- VIMS dune monitoring program

### **MISSING ELEMENTS:**

#### **1. Outreach**

- Education on disruption of natural processes from bulkheading, seawalls, breakwaters, cuts, development, etc.

#### **2. Regulation**

- Implementation of dune buffers

#### **3. Authority**

- Regulate use of secondary dunes
- Placement of RPA behind primary dunes

#### **4. Monitoring**

- Complete inventory and mapping of primary and secondary dunes and beaches in Virginia on a regular schedule

- **Planning/coordination**
  - CBP Environmental Endpoints
- **Research**
  - Biota of Virginia
  - Comprehensive Coastal Inventory – VIMS
  - Natural Heritage Inventory- DCR
  - Shoreline program - VIMS

N/A

- 5. Planning/coordination**
- 6. Research**
  - Provide better classification of dunes, beaches and wetlands
- 7. Definition of management targets**

**Strategic Goal B:** Expand existing regulation of dune protection program to cover non-regulated sand dunes and beaches

**Strategic Goal B Measures:**

- Increase in number of dune acres under management (jurisdictional)

**Intermediate Goals:**

None identified

**Intermediate Goal Measures:**

None identified

**EXISTING PROGRAMS:**

**1. Outreach**

**2. Regulation**

- Local Zoning

N/A

**3. Monitoring**

**4. Planning/coordination**

**MISSING ELEMENTS:**

**1. Outreach**

- Develop good education materials on values of dunes and their protection/management
- Education on disruption of natural processes from bulkheading, seawalls, breakwaters, cuts, development, etc.

**2. Regulation**

- Implementation of dune buffers

**3. Authority**

- Authorize protection of secondary and riverine dunes

**4. Monitoring**

**5. Planning/coordination**

- Include beach areas as part of dune system to protect/preserve/restore

**5. Research**

- Develop funding source(s) for land preservation

**6. Research**

N/A

**7. Definition of management targets**

**Strategic Goal C:** Increase in the amount of sand dunes restored to original function and extent

**Strategic Goal C Measures:**

- Increase in dune area in impact restricted easements and zoning

**Intermediate Goals:**

- 1.Change in public understanding of sand dune values
- 2.Increase in voluntary sand dune restoration/protection
- 3.Increase in government protection and restoration efforts

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved of sand dune values (via survey)
- Increase in number of dune restoration projects
- Increase in funding for dune restoration projects

**EXISTING PROGRAMS:**

**1. Outreach**

- CBC Habitat Restoration
- Citizen Watershed groups
- Coastal Zone Enhancement Act grants
- Conservation Easements (state/ NGOs)
- ERP Restoration Program
- Local gov't initiatives (e.g, sand fencing, Christmas trees)
- SEAS beach stabilization programs
- Section 309 grants
- Natural Area Preserves – DCR
- Virginia Land Conservation Foundation

**2. Regulation**

- DGIF Non-game Program
- DGIF Exotic Species Permits
- Marine Protected Areas –VMRC
- VDACS Endangered Plant and Insect Program
- VMRC Enforcement

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Develop good education materials on values of dunes and their protection/management
- Increase incentives to preserve dunes and their natural vegetation
- Education on disruption of natural processes from bulkheading, seawalls, breakwaters, cuts, development, etc.

**2. Regulation**

**3. Authority**

**3. Monitoring**

- Restoration tracking- DGIF

**4. Planning/coordination**

- CBP Environmental Endpoints
- Elizabeth River Action Plan
- Restoration Planning - DGIF

**5. Research**

- Biota of Virginia
- Comprehensive Coastal Inventory – VIMS
- Natural Heritage Inventory- DCR
- VIMS Shoreline program

N/A

**REACH**

Beachfront land owners  
 Federal, State and local decision makers  
 Recreational beach users  
 -dune buggy owners  
 -beach combers  
 General Assembly legislators  
 Wetland Boards

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Sea level rise and erosion  
 Increasing coastal waterfront development and population  
 Private property rights

**4. Monitoring**

- Ongoing inventory and mapping of primary and secondary dunes and beaches in Virginia on a regular schedule

**5. Planning/coordination**

**6. Research**

**7. Definition of management targets**

## **12. To reduce or prevent losses of public and private property caused by shorefront erosion**

**Strategic Goal A:** Property loss through shorefront erosion reduced or prevented

**Strategic Goal A Measures:**

- Decrease in total dollar amount of property loss

**Intermediate Goals:**

1. Identify properties at risk and/or levels of risk
2. Identify and implement shorefront erosion control measures where practicable
3. Change public understanding and behavior about building in areas of erosion
4. Site public and private construction in non-erosional zones/prevent building in threatened areas

**Intermediate Goal Measures:**

- Increase in amount of area inventoried for being at risk of erosion
- Increase in percentage of reach showing improved understanding of risks of building in areas of erosion (via survey)
- Decrease in number of permits for reconstruction
- Increase in percent of shoreline covered by management plans
- Decrease in number of CBPA violations
- Decrease in total value of infrastructure at risk

**EXISTING PROGRAMS:**

**1. Outreach**

- Citizen Watershed groups
- Corps technical assistance
- Land acquisition programs of high risk areas
- PDC local comp plans
- DCR
  - Community Education
  - Flood Prevention Protection Fund
  - Floodplain Management Program
  - Public Beach Board
  - SEAS
- Riparian restoration programs
- Floodplain maps
- National Flood Insurance Program
- CBLAD technical assistance

**2. Regulation**

- E & S – DCR/ local
- Local Zoning
- CBPA & Regulations
- Floodplain statute
- Virginia Building Code

**MISSING ELEMENTS:**

**1. Outreach**

- Increase programs to improve public awareness of erosion rates and risks
- Identify/recognize erosion as a hazard in flood insurance programs
- Eliminate existing incentives to develop in high erosion areas
- Education on disruption of natural processes from bulkheading, seawalls, breakwaters, etc.
- Increase number of citizen watershed groups

**2. Regulation**

- Implement full protection of primary dune systems
- Increase funding and staff for floodplain management
- Increase RPA enforcement/adherence



N/A

to guidelines

**3. Authority**

- Redirect activities that would significantly affect either natural erosion or accretion areas
- Mandate stormwater ordinance development & implementation
- Authorize protection of secondary dune systems
- prevent/reduce development in high risk areas

**3. Monitoring**

**4. Monitoring**

- Identify natural erosion and accretion areas.

**4. Planning/coordination**

- Barrier island policy
- Local government comprehensive plans
- Coastal Non-point Program

**5. Planning/coordination**

- Increase interagency and program integration and coordination
- Establish state leadership program addressing this issue

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- FEMA/Corps national shoreline erosion studies

**6. Research**

- Increase knowledge of the environmental impacts of different stabilization techniques

N/A

**7. Definition of management targets**

- Develop state policy on shoreline hardening

**REACH**

Land owners/ occupants (includes developers and governments)

Recreational and commercial boating (no wake zones, etc.)

Government decision makers

Realtors

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Private property rights

Environmental setting

Economics of land value

### **13. To protect life and property from coastal flooding and storms**

**Strategic Goal A:** Reduced number of death and injuries during coastal flooding and storm events

**Strategic Goal A Measures:**

- Decrease in number of deaths and injuries attributed to coastal flooding and storm events

**Intermediate Goals:**

1. Change in public understanding of the risks due to coastal flooding and storms/ change behavior
2. Regulate construction in coastal at-risk areas (including building codes and zoning)
3. Implement effective evacuation strategies and routes
4. Where appropriate, build structures to mitigate intensity of storm/flooding effects, such as flood containment and erosion control

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of risks of coastal flooding and storms (via survey)
- Increase in number of evacuation and/or mitigation projects
- Increase in funding for evacuation and/or mitigation projects
- Increase in percentage of at-risk area removed from development zoning

**EXISTING PROGRAMS:**

**1. Outreach**

- Citizen Watershed groups
- Dept of Emergency Management
- DCR
  - Community Education
  - Flood Prevention Protection
  - Floodplain Management
  - Public Beach Board
  - SEAS
  - Riparian restoration programs
  - Floodplain maps
- National Flood Insurance Program

**2. Regulation**

- Building code
- Coastal Primary Sand Dune Permits - VMRC
- FEMA Programs
- Local zoning
- CBPA and Regulations

**MISSING ELEMENTS:**

**1. Outreach**

- Develop shoreland management tool
- Education on disruption of natural processes from bulkheading, seawalls, breakwaters, etc.
- Increase number of citizen watershed groups

**2. Regulation**

- Increase riparian buffers (full 100' buffer implementation and enforcement)

**3. Authority**

- Prevent development in floodplain from non-dependent use
- Implement mandatory stormwater management to reduce impacts of no or

N/A

management to reduce impacts of no or ineffective management of runoff

**3. Monitoring**

- VIMS dune monitoring

**4. Planning/coordination**

- Department of Emergency Management programs
- HRPDC regional emergency management

**5. Research**

N/A

**4. Monitoring**

- Inventory coastal areas at risk due to coastal flooding/storms (database or GIS) - further refinement of FEMA maps.

**5. Planning/coordination**

- Establish state leadership for planning and risk reduction
- Increase/establish local/state coordination in planning and regulation to reduce risks

**6. Research**

**7. Definition of management targets**

**Strategic Goal B:** Reduced property damage as a result of coastal flooding and storms

**Strategic Goal B Measures:**

- Decrease in monetary value of destruction and/or damage due to coastal flooding and storms

**Intermediate Goals:**

1. Change public understanding of risks due to coastal flooding and storms/ change behavior
2. Regulate construction in coastal at-risk areas (including building codes and zoning)
3. Where appropriate, build structures to mitigate intensity of storm/flooding effects, such as flood containment and erosion control

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of risks of coastal flooding and storms (via survey)
- Increase in percentage of coastal zone inventoried and identified for at-risk areas (including the monetary value at risk)
- Decrease in total property value at risk

**EXISTING PROGRAMS:**

**1. Outreach**

- Citizen Watershed groups
- DCR
  - Community Education
  - Flood Prevention Protection Fund
  - Floodplain Management

**MISSING ELEMENTS:**

**1. Outreach**

- Develop shoreland management tool
- Education on disruption of natural processes from bulkheading, seawalls, breakwaters, etc.
- Increase citizen watershed groups

- Public Beach Board
- SEAS
- Riparian restoration programs
- Floodplain maps
- National Flood Insurance Program

**2. Regulation**

- Building code
- Coastal Primary Sand Dune Permits - VMRC
- FEMA Programs
- Local zoning
- CBPA & Regulations

N/A

**3. Monitoring**

- 

**4. Planning/coordination**

- Department of Emergency Services programs
- HRPDC regional emergency management

**5. Research**

- Dune project

N/A

**REACH**

Coastal residents

Legislators

Tourists

Evacuation decision-makers

Insurance industry

**2. Regulation**

- Increase riparian buffers (full 100' buffer implementation and enforcement)

**3. Authority**

- Prevent development in floodplain from non-dependent use
- Implement mandatory stormwater management to reduce impacts of no or ineffective management of runoff

**4. Monitoring**

- Inventory coastal areas at risk due to coastal flooding/storms (database or GIS) - further refinement of FEMA maps.

**5. Planning/coordination**

- Establish state leadership for planning and risk reduction
- 8. Increase/establish local/state coordination in planning and regulation to reduce risks

**6. Research**

**7. Definition of management targets**

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT:**

Politics

Private property rights

Limited highway evacuation capacity

Insurance requirements

Natural disasters

**14. To promote the appropriate use of coastal resources for the benefit of the citizens of the Commonwealth**

**Strategic Goal A:** Provide a stable, sustainable marine dependent economy which does not jeopardize the near or long-term availability of our natural resources, aesthetic values and the health of our ecosystems

**Strategic Goal A Measures:**

- No decrease in natural resource availability coupled with a stable or improving economic situation

**Intermediate Goals:**

1. Quantify coastal resources: population levels and ecosystem interactions
2. Identify demands on resources and situations in which extraction/use is feasible without jeopardizing near or long-term sustainability (economic and ecological)
3. Establish and implement plans for retaining ecosystem integrity while minimizing negative socioeconomic impacts
4. Implement the precautionary principle: act when possible where the greatest margin of error favors preservation of the resource

**Intermediate Goal Measures:**

- Increase in percentage of coastal resources inventoried and classified for use
- Increase in percentage of resources under management plans
- Increase in percentage of Democrats in the General Assembly

**EXISTING PROGRAMS:**

**1. Outreach**

- Clean Marina Program
- Coastal Birding and Wildlife Trail
- Economic Development Partners GIS
- Land Renewal Program – DEQ
- Saltwater Sport Fishing Tournament
- DCR NPS education
- DCR Public Access
- DCR Parks & Recreation
- Chesapeake Bay Program
- Public Beach Board

**2. Regulation**

- Permitting programs
- Local Zoning
- Fisheries Regulations - VMRC

N/A

**3. Monitoring**

- VIMS trawl survey, dredge survey,

**MISSING ELEMENTS:**

**1. Outreach**

- Increase understanding of the link between environmental and economic condition

**2. Regulation**

**3. Authority**

- Bay zoning

**4. Monitoring**

- Develop and maintain inventory of

spat set survey, SAV program, coastal inventory, wetlands and shoreline programs

environmental and resource conditions

**4. Planning/coordination**

- Commercial Fishing Advisory Board

**5. Planning/coordination**

**5. Research**

- VIMS' overall mission

**6. Research**

N/A

**7. Definition of management targets**

- Need definition of economic values of natural resources (aesthetic, recreational use, etc)

**REACH**

General public, especially populace of the coastal zone

Coastal Resource Managers

Policy makers

RCP's

PDC's

Economic Development Partners

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Land use decisions within the watershed

Lack of good fisheries data

Policies within the watershed inconsistent with wise use

Political will

**15. To protect and maintain existing uses of estuarine waters for shellfish propagation and harvesting**

**Strategic Goal A:** Clean shellfish waters and benthic habitats for growth and harvesting

**Strategic Goal A Measures:**

- Decrease in area of shellfish closure

**Intermediate Goals:**

1. Change public understanding/behavior regarding PS and NPS pollution
2. Reduce pathogens, toxics and nutrient levels to “safe levels” in waters affecting shellfish
3. Clean up beds/waters when and where appropriate

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of point and non-point source pollution as it affects shellfish (via survey)
- Increase in percentage of impaired waters with implemented TMDL’s (to 100%)

**EXISTING PROGRAMS:**

**1. Outreach**

- BMP’s
- Clean Marina Program
- Virginia Oyster Heritage Program
- Water quality improvement fund
- VDH Shellfish Sanitation Program
- NPS programs – DCR (Coastal Nonpoint Program, 319)
- Oyster Gardening Program
- Chesapeake Bay Program
- CBF efforts

**2. Regulation**

- Erosion and Sedimentation programs - DCR
- Marine Protected Areas –VMRC
- Sewage/septic tank clean-up programs
- TMDLs (point & nonpoint)
- VDH sanitation permits
- DEQ water discharge permits (cumulative and secondary impacts consideration)

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Improve technical guidance and support for BMP implementation
- Provide WQIF funds

**2. Regulation**

- Shallow water use designations

**3. Authority**

- Develop state authority to direct/manage impacts from riparian land uses



**3. Monitoring**

- Alliance citizen monitoring
- Seawater sampling – VDH
- Shoreline survey - VDH
- DEQ water quality monitoring

**4. Planning/coordination**

- Clam Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Shellfish Management Advisory Committee (VMRC)

**5. Research**

- VIMS ABC, Sea Grant

**4. Monitoring**

- Identify sources of contaminants, fecal coliforms

**5. Planning/coordination**

- map sensitive areas or areas w/ potential sensitivity to pollution

**6. Research**

- Identify mechanisms for controlling wildlife fecal coliform
- Identify link between land-use and water quality

**7. Definition of management targets**

N/A

**Strategic Goal B:** Healthy and productive natural shellfish beds

**Strategic Goal B Measures:**

- Increase in amount of shellfish marketed (to OSY)
- Increase in areal and temporal extent of monitoring

**Intermediate Goals:**

1. Address disease and related water quality issues for all shellfish beds
2. Continuously monitor population health and establish and regulate takes in special management areas (unimproved waters and relaying)

**Intermediate Goal Measures:**

- *None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- BMP's
- Clean Marina Program
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- Virginia Oyster Heritage Program
- Water quality improvement fund
- VDH Shellfish Sanitation Program
- NPS programs – DCR (Coastal

**MISSING ELEMENTS:**

**1. Outreach**

- Provide WQIF funds

- Nonpoint Program, 319)
- Oyster Gardening Program
- Chesapeake Bay Program

**2. Regulation**

- Erosion and Sedimentation programs - DCR
- Marine Protected Areas –VMRC
- Sewage/septic tank clean-up programs
- TMDLs (point & nonpoint)
- VDH sanitation permits
- DEQ water discharge permits (cumulative and secondary impacts consideration)
- Baylor grounds

N/A

**3. Monitoring**

- Alliance citizen monitoring
- Seawater sampling – VDH
- Shoreline survey - VDH
- DEQ water quality monitoring

**4. Planning/coordination**

- Clam Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Shellfish Management Advisory Committee (VMRC)

**5. Research**

- VIMS disease research

N/A

**2. Regulation**

**3. Authority**

- Develop state authority to direct/manage impacts from riparian land uses

**4. Monitoring**

- Identify sources of contaminants, fecal coliforms

**5. Planning/coordination**

**6. Research**

- Identify mechanisms for controlling wildlife fecal coliform
- Identify link between land-use and water quality

**7. Definition of management targets**

**Strategic Goal C:** Maintain productive, clean, and environmentally-friendly aquaculture facilities

**Strategic Goal C Measures:**

- Increase (to 100%) percentage of aquaculture facilities meeting state health and environmental requirements
- Increase in amounts of marketed aquaculture products

**Intermediate Goals:**

1. Establish criteria/health and environmental standards and licensing for shellfish aquaculture facilities
2. Conduct comprehensive and continuous monitoring of all shellfish aquaculture facilities and the surrounding environment

**Intermediate Goal Measures:**

- Increase in marketed aquaculture products

**EXISTING PROGRAMS:**

**1. Outreach**

- Virginia Oyster Heritage Program
- CZMA Section 309 funding

**2. Regulation**

- VDH certification for shellfish sales

N/A

**3. Monitoring**

- VDH shoreline survey
- VDH seawater monitoring

**4. Planning/coordination**

- Clam Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Shellfish Management Advisory Committee (VMRC)

**5. Research**

- Sea Grant

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Improve technical guidance and support for BMP implementation

**2. Regulation**

**3. Authority**

**4. Monitoring**

- Inventory aquaculture facilities/activities

**5. Planning/coordination**

- map sensitive areas or areas w/ potential sensitivity to pollution

**6. Research**

**7. Definition of management targets**

**REACH**

Harvesters

Policy makers

Managers

General Public

Industries affecting water quality

Riparian landowners

Agriculture

Developers, etc.

DEQ/Health

Local landfills

local health departments

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Weather

Political will

Land-use decisions

Fecal coliforms from wildlife

**16. To guide business location on coastal waters where essential to desired economic activities**

**Strategic Goal A:** New business development in coastal areas limited to water -dependent or water-enhanced activities which will minimally impact environmental setting

**Strategic Goal A Measures:**

- Decrease in number of RPA violations

**Intermediate Goals:**

1. Identify business activities considered dependent upon coastal location
2. Identification of coastal resource elements (fisheries, habitats, etc.)
3. Classify economic use opportunities for coastal areas by sensitivity of coastal resources to development types
4. Change public/planners/decision makers behavior/ understanding of coastal resources and development's long term effects
5. Regulate building in coastal areas according to 1 and 2
6. Coordinate permitting and planning

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of coastal resources and development's long term effects (via survey)
- Increase in percentage of coastal zone inventoried and classified for appropriate use

**EXISTING PROGRAMS:**

**1. Outreach**

- Shoreland planning 309 grants
- VEDP site search
- DCR-Floodplain management
- Shellfish Programs

**2. Regulation**

- Local Zoning
- VWPP, designation of impaired waters, DEQ
- CBPA/Regulations
- Building Code
- Floodplain management

N/A

**3. Monitoring**

- DEQ water quality monitoring
- VIMS Wetlands Program permit tracking

**MISSING ELEMENTS:**

**1. Outreach**

- Develop adequate technical and financial assistance to localities to meet this goal.

**2. Regulation**

- Authorize and fund enforcement resources (permit compliance)

**3. Authority**

- Develop shallow water use planning/management (aquatic resource zoning)

**4. Monitoring**

**4. Planning/coordination**

- CBLAD coastal lands management
- Elizabeth River Action Plan
- PDC Comp plans
- Transportation planning
- 305(b) report & 303(d) list

**5. Planning/coordination**

- Provide incentives to localities that zone appropriately
- Develop guidance for shoreland planning
- Coordinate state and local regulatory programs

**5. Research**

- Comprehensive Coastal Inventory – VIMS

**6. Research**

- Develop tool for siting marinas, aquaculture and other shallow water uses

N/A

**7. Definition of management targets**

**Strategic Goal B:** Zoning of existing structures when they become available on the market to be used for water dependent or water enhanced activities, with consideration given to economic and environmental suitability of government property purchase and restoration to natural communities

**Strategic Goal B Measures:**

- Decrease in number of RPA violations

**Intermediate Goals:**

1. Identify business activities considered dependent upon coastal location
2. Classify economic use opportunities for coastal areas by sensitivity of coastal resources to development types
3. Change in public/planners/decision makers behavior/ understanding or coastal resources and development’s long term effects
4. Regulate re-use in coastal areas according to 1 and 2

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of coastal resources and development’s long term effects (via survey)
- Increase in percentage of existing developed coastal areas that are classified for redevelopment

**EXISTING PROGRAMS:**

**1. Outreach**

- Shoreland planning 309 grants
- VEDP site search
- DCR-Floodplain management
- Shellfish Programs

**2. Regulation**

**MISSING ELEMENTS:**

**1. Outreach**

- Develop adequate technical and financial assistance to localities to meet this goal

**2. Regulation**

- Local Zoning
- VWPP, designation of impaired waters, DEQ
- CBPA/Regulations
- Building Code
- Floodplain management

N/A

### 3. Monitoring

- DEQ water quality monitoring

### 4. Planning/coordination

- CBLAD coastal lands management
- Elizabeth River Action Plan
- PDC Comp plans
- Transportation planning
- 305(b) report & 303(d) list

### 5. Research

- Comprehensive Coastal Inventory – VIMS
- Sea Grant

N/A

## REACH

Public

Regulators

Developers

Real Estate Agents

Governmental Planners

Economic Development Officers

Chamber of Commerce

Corporations

### Reach measures:

- Proportion of reach participating in outreach programs

- Authorize and fund enforcement resources

### 3. Authority

- Develop shallow water use planning/management (aquatic resource zoning)
- Provide statutory authority for use of impact fees

### 4. Monitoring

### 5. Planning/coordination

- Provide incentives to localities that zone appropriately
- Develop guidance for shoreland planning
- Coordinate state and local regulatory programs

### 6. Research

- Develop tool for siting marinas, aquaculture and other shallow water uses

### 7. Definition of management targets

- Define “desired” economic activities

## **CONTEXT**

Politics

Local government revenue limits

Differing interpretations of what is “necessary” or “appropriate”

Zoning ordinances



**17. To improve long-term development patterns through effective coordination of governmental planning processes**

**Strategic Goal A:** Coordination of planning and zoning at state, local, regional and federal levels to incorporate environmental protection with economic sustainability

**Strategic Goal A Measures:**

- Increase in percent and number of local comp plans with integrated consideration of coastal resources

**Intermediate Goals:**

1. Better knowledge of land resources
2. Steer development into desirable areas
3. Sustainable building practices
4. Coordination Mechanism
5. Transportation planning consistent with development and environmental protection plans
6. Market VA's "Quality of Life"
7. Regional open space plans
8. State-wide planning process
9. Identify framework of goals for open-space preservation and use based on environmental sensitivity at all scales of space/government
10. Compensate localities that have identified greater amount of critical areas targeted for preservation for the subsequent loss in revenues
11. Encourage eco-friendly uses

**Intermediate Goal Measures:**

- Increase in percentage of total land area inventoried and categorized for appropriate land use according to environmental parameters

**EXISTING PROGRAMS:**

**1. Outreach**

- Building America
- Citizen Watershed groups
- DEQ land renewal program
- EDP GIS
- Rebuild America
- VDACS and tourism marketing
- Virginia Housing and Environmental Network
- Virginia Land Conservation Foundation
- Virginia Outdoors Foundation
- Virginia Outdoors Plan
- Virginia Sustainable Futures Conference
- Low Impact Development Workshops-CBLAD

**MISSING ELEMENTS:**

**1. Outreach**

- Expand outreach on brownfield redevelopment incentives
- Expand technical assistance and funding for local/regional planning
- Identify/expand incentives for smart growth

## 2. Regulation

- Bay Act
- Local Zoning
- Source water protection
- Water withdrawal permits
- DEQ water discharge permits (consideration of cumulative & secondary impacts)

N/A

## 3. Monitoring

### 4. Planning/coordination

- CBLAD comprehensive plan requirements
- PDC planning

## 2. Regulation

### 3. Authority

- Identify and authorize a lead agency for coordination of planning processes
- Enact enabling legislation for local programs to preserve sensitive land(s)
- Provide management tools to local governments for control of development (e.g. impact fees)
- Mandate statewide stormwater ordinance development & implementation

### 4. Monitoring

- Develop and maintain a comprehensive environmental database (GIS) to support local/regional planning

### 5. Planning/coordination

- Establish effective coordination/communication between local and state governments
- Support/implement comprehensive regional planning
- Support/implement capacity planning efforts
- Establish State leadership in planning through development of a state-wide planning process (conservation, preservation, water use, transportation, development)
- Establish effective coordination between Chesapeake Bay Program and Virginia Coastal Program
- Support effort to update soil survey
- State-wide consistency between localities

**5. Research**

- Comprehensive Coastal Inventory – VIMS
- Heritage resource identification process
- VGIN
- EAGLE

**6. Research**

- Identify customer base for available information

**7. Definition of management targets**

N/A

**REACH**

Public  
Legislators  
Government Planners  
Developers

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Old fashioned development desires (“cookie cutter” among buyers)  
Financing restraints/constraints  
Legal constraints  
Politics

**18. To improve and maintain productive and ecologically sound fisheries**

**Strategic Goal A:** Maintain clean waters (refer to goal 1 and 2)

**Strategic Goal A Measures:**

- Increased percentage of impaired waters with implemented TMDLs

**Intermediate Goals:**

1. Change public understanding/behavior regarding PS and NPS pollution
2. Reduce toxics and nutrient levels to identified ‘safe’ levels in all waters
3. Clean up benthic habitat/waters when appropriate

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding point and non-point source pollution (via survey)

**EXISTING PROGRAMS:**

**1. Outreach**

- Adopt a stream
- Citizen Watershed groups
- HR Storm
- HR Clean
- Virginia Marine Science Museum
- Chesapeake Bay Program
- DCR NPS education

**2. Regulation**

- VMRC fisheries regulations
- TMDL (point & nonpoint)
- DEQ water discharge permits

N/A

**3. Monitoring**

- VIMS SAV Study

**4. Planning/coordination**

- CBP Environmental Endpoints
- Oyster Restoration Plan
- Atlantic States Marine Fisheries Plans

**5. Research**

- VIMS enhanced monitoring

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Enhance DCR NPS education effort to incorporate/reflect fisheries information

**2. Regulation**

- shallow water use designations

**3. Authority**

**4. Monitoring**

- Detailed effort surveys
- Better fishery-independent data

**5. Planning/coordination**

**6. Research**

**7. Definition of management targets**

- Expand knowledge of habitat requirements and causes of habitat

degradation

**Strategic Goal B:** Maintain healthy and productive essential fish habitat.

**Strategic Goal B Measures:**

- Increase in area of SAV
- Decrease in area of wetland loss

**Intermediate Goals:**

1. Establish EFH for all harvested species and their prey
2. Identify threats to EFH
3. Protect EFH for all harvested species and their prey

**Intermediate Goal Measures:**

*None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- Adopt a stream
- Citizen Watershed groups
- Habitat Suitability Indexes
- HR Storm
- HR Clean
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- Sea Grant
- Sport Fishing Restoration- Dingell-Johnson - VMRC/DGIF
- VIMS matrix on harvested shellfish data
- Virginia Marine Science Museum
- Sea Grant Marine Advisory Service

**2. Regulation**

- VMRC
  - Marine Protected Areas
  - Fisheries Regulations
  - VMRC Enforcement
- DGIF
  - Fisheries Regulations

N/A

**MISSING ELEMENTS:**

**1. Outreach**

- Develop certification program to encourage public to eat sustainably harvested seafood (e.g. “dolphin safe”)
- Promote development of sustainable fisheries for under-utilized species (e.g. croaker)

**2. Regulation**

**3. Authority**

- Restructure state regulatory authority (VMRC) to reduce socio-economic impacts on harvest quota decisions

### 3. Monitoring

- VIMS SAV studies, trawl survey, bottom type

### 4. Planning/coordination

- Atlantic States Marine Fisheries Plans
- Bay Program Ecosystem Management
- Blue Crab Management Advisory Committee (VMRC)
- Clam Management Advisory Committee (VMRC)
- CBC Blue Crab Management
- CBP Environmental Endpoints
- Commercial Fishing Advisory Board
- Finfish Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Recreational Fishing Advisory Board (VMRC)
- Shellfish Management Advisory Committee (VMRC)

### 5. Research

N/A

### 4. Monitoring

- Inventory bottom type and essential habitats
- Map and monitor restoration efforts

### 5. Planning/coordination

### 6. Research

- Expand knowledge of habitat requirements and causes of habitat degradation

### 7. Definition of management targets

**Strategic Goal C:** Maintain food web dynamics

**Strategic Goal C Measures:**

- Increase in number of adopted and implemented multi-species management plans

*There are no intermediate goals identified*

**EXISTING PROGRAMS:**

#### 1. Outreach

- Fish Stocking -DGIF
- Governor's Fishing Tournament
- Habitat Suitability Indexes
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- Sea Grant
- Sport Fishing Restoration- Dingell-

**MISSING ELEMENTS:**

#### 1. Outreach

- Promote development of sustainable fisheries for under-utilized species

Johnson - VMRC/DGIF

- VIMS matrix on harvested shellfish data
- Virginia Marine Science Museum

## **2. Regulation**

- VMRC
  - Fisheries Regulations
  - VMRC Enforcement
- DGIF
  - Fisheries Regulations

N/A

## **3. Monitoring**

- VMRC Stock Assessment

## **4. Planning/coordination**

- Atlantic States Marine Fisheries Plans
- Bay Program Ecosystem Management
- Blue Crab Management Advisory Committee (VMRC)
- Clam Management Advisory Committee (VMRC)
- CBC Blue Crab Management
- CBP Environmental Endpoints
- Commercial Fishing Advisory Board
- Finfish Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Recreational Fishing Advisory Board (VMRC)
- Shellfish Management Advisory Committee (VMRC)

## **5. Research**

N/A

## **2. Regulation**

## **3. Authority**

- Restructure state regulatory authority (VMRC) to reduce socio-economic impacts on harvest quota decisions

## **4. Monitoring**

- Develop/maintain excellent fishery and fishery-independent data for all species

## **5. Planning/coordination**

## **6. Research**

- Expand knowledge of habitat requirements and causes of habitat degradation

## **7. Definition of management targets**

**Strategic Goal D:** Catch limited to OSY

**Strategic Goal D Measures:**

- Decrease in number of commercial species not harvested at OSY
- Decrease in number of fisheries management plan violations

**Intermediate Goals:**

1. Establish and regulate takes for all harvested species
2. Continuously monitor population health for all harvested species
3. Increase in percentage of reach showing improved understanding of fishing pressures and the importance of ecosystem integrity (via survey)

**Intermediate Goal Measures:**

*None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- Governor’s Fishing Tournament
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- Saltwater Sport Fishing Tournament
- Sea Grant
- Sport Fishing Restoration- Dingell-Johnson - VMRC/DGIF
- VIMS matrix on harvested shellfish data
- Virginia Marine Science Museum

**2. Regulation**

- VMRC
  - Fisheries Regulations
  - VMRC Enforcement
- DGIF
  - Fisheries Regulations

N/A

**3. Monitoring**

- VMRC Stock Assessment
- VIMS trawl, dredge, oyster surveys

**4. Planning/coordination**

**MISSING ELEMENTS:**

**1. Outreach**

**2. Regulation**

- Limit/remove non-Virginia commercial boats from harvesting in Virginia waters

**3. Authority**

- Restructure state regulatory authority (VMRC) to reduce socio-economic impacts on harvest quota decisions

**4. Monitoring**

- Develop/maintain excellent fishery and fishery-independent data for all species

**5. Planning/coordination**



- Atlantic States Marine Fisheries Plans
- Bay Program Ecosystem Management
- Blue Crab Management Advisory Committee (VMRC)
- Clam Management Advisory Committee (VMRC)
- CBC Blue Crab Management
- CBP Environmental Endpoints
- Commercial Fishing Advisory Board
- Finfish Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Recreational Fishing Advisory Board (VMRC)
- Shellfish Management Advisory Committee (VMRC)

#### 5. Research

- VIMS stock assessment

#### 6. Research

#### 7. Definition of management targets

**Strategic Goal E:** Maintain productive, clean and environmentally-friendly aquaculture

**Strategic Goal E Measures:**

- Increase in the amount of fish and shellfish produced and marketed from aquaculture facilities
- Decrease in the number of aquaculture facilities violating state health and environmental requirements

**Intermediate Goals**

1. Change rec. and commercial understanding of “responsible fishing” practices
2. Establish criteria/health and environmental standards and licensing for aquaculture facilities
3. Conduct comprehensive and continuous monitoring of all aquaculture facilities and the surrounding environment

**Intermediate Goal Measures:**

*None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- DEQ- VCP

**MISSING ELEMENTS:**

**1. Outreach**

- Develop and implement programs to change fishing ethics (consider Maine model)

**2. Regulation**

- VMRC
  - Fisheries Regulations
  - VMRC Enforcement
- DGIF
  - Fisheries Regulations

N/A

**3. Monitoring**

**4. Planning/coordination**

- Blue Crab Management Advisory Committee (VMRC)
- Clam Management Advisory Committee (VMRC)
- Shellfish Management Advisory Committee (VMRC)

**5. Research**

N/A

**2. Regulation**

**3. Authority**

- Bay zoning

**4. Monitoring**

**5. Planning/coordination**

**6. Research**

- Expand knowledge of habitat requirements and causes of habitat degradation

**7. Definition of management targets**

**Strategic Goal F:** Minimize non-harvest mortalities (e.g., by-catch, catch/release)

**Strategic Goal F Measures:**

- Decrease in the amount of non-harvested mortalities

**Intermediate Goals:**

1. Identify sources of non-harvest mortalities
2. Manage for non-harvesting mortalities

**Intermediate Goal Measures:**

*None identified*

## **EXISTING PROGRAMS:**

### **1. Outreach**

- Governor's Fishing Tournament
- Oyster Reef Restoration- CBF
- Oyster Reef Restoration- VMRC
- Saltwater Sport Fishing Tournament
- Sea Grant
- Sport Fishing Restoration- Dingell-Johnson - VMRC/DGIF
- Virginia Marine Science Museum

### **2. Regulation**

- VMRC
  - Fisheries Regulations
  - VMRC Enforcement
- DGIF
  - Fisheries Regulations

N/A

### **3. Monitoring**

### **4. Planning/coordination**

- Atlantic States Marine Fisheries Plans
- Bay Program Ecosystem Management
- Blue Crab Management Advisory Committee (VMRC)
- Clam Management Advisory Committee (VMRC)
- CBC Blue Crab Management
- CBP Environmental Endpoints
- Commercial Fishing Advisory Board
- Finfish Management Advisory Committee (VMRC)
- Oyster Restoration Plan
- Recreational Fishing Advisory Board (VMRC)
- Shellfish Management Advisory Committee (VMRC)

### **5. Research**

## **MISSING ELEMENTS:**

### **1. Outreach**

- Develop and implement programs to change fishing ethics (consider Maine model)
- Promote development of sustainable fisheries for under-utilized species (e.g. croaker)

### **2. Regulation.**

### **3. Authority**

### **4. Monitoring**

- Develop/maintain excellent fishery and fishery-independent data for all species

### **5. Planning/coordination**

### **6. Research**

- Identify sources of non-fishery mortality

- Expand knowledge of habitat requirements and causes of habitat degradation

N/A

## **7. Definition of management targets**

### **REACH**

Harvesters/Processors

Managers/ Policy makers

Farmer (livestock and crop)

Septic tank users

### **Reach measures:**

- Proportion of reach participating in outreach programs

### **CONTEXT**

Market demand

Weather

Natural fluctuations

**19. To encourage exploration and production of oil and gas resources off the Atlantic coast.**

**Strategic Goal A:** Increased exploration and subsequent production of oil and gas resources off the Atlantic Coast

**Strategic Goal A Measures:**

- Increase in amount of programs aimed at oil and gas exploration and production off the Atlantic Coast
- Increase in funding for oil and gas exploration and production off the Atlantic Coast

**Intermediate Goals:**

1. Identify reserves
2. Develop zoning map of coastal waters to include EFH and areas of ecological importance, to include disaster scenario analysis based on petrological research and understanding of local currents and potential weather conditions
3. Regulate and enforce restrictions on extraction based on zoning maps and disaster scenario analyses
4. Provide incentives to extraction companies
5. Develop competitive process for drilling rights

**Intermediate Goal Measures:**

- Increase in percentage of shelf inventoried and zoned for potential oil and gas production

**EXISTING PROGRAMS:**

**1. Outreach**

- VEDP

**2. Regulation**

- DMME
- VMRC

N/A

**3. Monitoring**

**4. Planning/coordination**

9. Submerged Minerals Management Plan

**MISSING ELEMENTS:**

**1. Outreach**

**2. Regulation**

- Develop state guidelines for exploration and production of off-shore resources
- Develop guidelines for zoning state-owned bottomlands
- Revise process for obtaining drilling rights

**3. Authority**

**4. Monitoring**

- Inventory of off-shore resources

**5. Planning/coordination**

- Develop state policy/plan for onshore infrastructure needed to support offshore extraction
- Identify the entities/organizations that

need to be involved

**5. Research**

N/A

**REACH**

Energy Industry  
Politicians

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Environmental issues  
Geographic/weather setting  
Resource demand

**6. Research**

- Develop alternative energy

**7. Definition of management targets**

**20. To provide for the appropriate extraction of mineral resources (e.g. sand mining and shell mining) in a manner consistent with proper environmental practices**

**Strategic Goal A:** Effective extraction of resources without environmental damage

**Strategic Goal A Measures:**

- Increase in percent permit compliance for mineral extraction projects (to 100%)

**Intermediate Goals:**

1. Identify reserves of sand and shell
2. Develop zoning maps of coastal waters to include EFH and areas of ecological importance, as well as location and extent of mineral resources to determine appropriate areas of extraction
3. Develop and use technology that will allow extraction while minimizing impact to aquatic life (e.g., turtle excluder devices, etc.)
4. Regulate and enforce restrictions based on # 1 and # 2

**Intermediate Goal Measures:**

- Increase in percentage of area inventoried and identified for potential extraction
- Decrease in number of endangered animals killed by mining protects (to 0)

**EXISTING PROGRAMS:**

**1. Outreach**

- Shell deposit maps

**2. Regulation**

- Local Zoning
- Time of year restrictions
- VMRC submerged lands permitting
- DMME

N/A

**3. Monitoring**

- VIMS plume study of shell mining

**4. Planning/coordination**

- Beneficial use of dredge material
- Submerged Minerals Management Plan
- Public beach board

**MISSING ELEMENTS:**

**1. Outreach**

- shallow water use designations
- evaluate need for increased site inspections

**3. Authority**

- 

**4. Monitoring**

- Inventory subaqueous lands (e.g., bottom types and critical habitats)

**5. Planning/coordination**

- Coordinate agencies/programs addressing subaqueous land uses
- Identify and manage terrestrial mining activities impacting subaqueous lands
- Implement latest technologies for minimizing impacts
- Identify options for improving surface water quality and/or instream & riparian habitats

## 5. Research

N/A

## 6. Research

### 7. Definition of management targets

- Define wise use of sand and shell

### REACH

Local government beach boards

Mining industry

NMFS

Corps of Engineers

USGS

MME

Hampton Roads localities wanting sand

VOHP/Jim Wesson wanting shell for reef restoration

MMS

### Reach measures:

- Proportion of reach participating in outreach programs

### CONTEXT

Increased need for sand for beach Increasing demand for titanium golf clubs

Technological advances in mining apparatus



**21. To add new and improve existing public access to coastal waters and shorefront lands for a variety of recreational and educational uses throughout the coastal area**

**Strategic Goal A.** Increased number and quality of public access sites

(30% increase in sites by 2010; 500 miles of designated water trails by 2005)

**Strategic Goal A Measures:**

- Increase in number of water access sites
  - Boat ramps
  - public piers
  - waterfront parks
  - beaches

**Intermediate Goals:**

1. Assess need for new access sites and upgrades by local demand and type of demand
2. Increased buy-in /understanding of public access issues by public and public officials
3. Acquire land, build and upgrade facilities at appropriate sites

**Intermediate Goal Measures:**

- Increase in percentage of reach showing improved understanding of public access issues (via survey)
- Increase in funding for acquisition and upgrades
- Increase in number of projects to upgrade facilities

**EXISTING PROGRAMS:**

**1. Outreach**

- Adopt a stream
- Boater Education – Coast Guard
- Boating Access Program – DGIF
- Chesapeake Bay program
- DCR-Cooperative Watershed Initiative
- Clean Marinas Program
- Citizen Watershed groups
- Coastal Birding and Wildlife Trail
- CZM grants
- DCR access sites
- Fall River Renaissance
- Natural Heritage Area Sites
- NOAA/NERRS Coastal training initiative
- NPS gateways
- Operation Spruce-Up/Fall River Renaissance
- Public Access Tax reduction
- Public Beach Board- DCR
- Saltwater Sport Fishing Tournament
- T-21 enhancement program
- Virginia Coastal and Estuarine Research Reserves

**MISSING ELEMENTS:**

**1. Outreach**

- Expand promotion of existing programs

- Virginia Land Conservation Foundation
- Virginia Naturally

**2. Regulation**

- Local Zoning
- Local comp plans
- CBPA/Regulations

N/A

**3. Monitoring**

- Public beach – VIMS

**4. Planning/coordination**

- Bay Access Plan
- Bay Public Access Survey
- Virginia Outdoors Fund
- Virginia Outdoors Plan (DCR)
- Public Beach Board (DCR)

**5. Research**

- Economic benefit analysis
- Assess economic benefit

N/A

**2. Regulation**

**3. Authority**

- Develop new and enhance existing mechanisms to protect/maintain areas
- Expand funding mechanisms for access development/maintenance
- Develop regional public access authority

**4. Monitoring**

- Inventory/monitor riparian land ownership

**5. Planning/coordination**

- Develop regional/local master plans for access addressing all types of use (e.g. intensive recreational to preserved natural areas)
- Address changing natural conditions in access/use management
- Collaborate with local authorities (e.g. police) for site management

**6. Research**

- Develop economic benefit analysis

**7. Definition of management targets**

- Develop a functional definition of “access” to guide goal setting (use types and requirements)

**REACH**

Governmental and private shorefront property owners (not just as owners, but also as acquirers, planners and monitors)

Decision makers- general assembly

General public

Developers, consultants, contractors  
Science/Research community  
Military  
Other states  
Tourist groups (e.g. Assateague Coastal Trust  
Schools/students  
Local government service staff  
Non-profit groups/citizen groups

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

NIMBY attitude  
Fear of crime  
Maintenance and Management  
Use conflicts  
Increasing costs of shoreline property

**22. To provide a riparian permitting process, coordinated at all government levels, that addresses environmental issues and appropriate mitigation while providing a timely response to applicants**

**Strategic Goal A.** Permitting handled by local government

**Strategic Goal A Measures:**

- Increase in percentage of localities taking over permitting (to 100%)

**Intermediate Goals:**

1. Develop shoreline permitting strategy and regulations to be adopted by local governments
2. Provide necessary data, information, and training for local government to assess permit applications
3. Provide incentives for local governments to take on permitting responsibility

**Intermediate Goal Measures:**

*None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- Marina guidelines
- Mitigation/compensation guidelines
- SEAS
- VIMS educational programs
- Watershed based regional offices - DCR
- Wetland and dunes guidelines
- DOF Riparian Restoration effort
- Chesapeake Bay Program
- Conservation Reserve Enhancement Program

**2. Regulation**

- CBLAD
- Dunes permitting
- Subaqueous lands permitting
- Local Zoning
- Non-tidal wetlands program - DEQ
- Tidal Wetlands Act (VMRC/ local gov't)

N/A

**3. Monitoring**

- VIMS permit tracking

**MISSING ELEMENTS:**

**1. Outreach**

- Develop compensation/mitigation guidance/standards for local governments
- Enhance education materials to explain shoreline changes that can occur from improper use of bulkheads, breakwaters, sea walls, etc.

**2. Regulation**

- Identify options for improving surface water quality and/or instream & riparian habitats
- Full implementation and enforcement of CBPA 100' buffer requirement

**3. Authority**

- Require local implementation of state standards for regulatory processes (include state oversight)

**4. Monitoring**

- Track increase/decrease in habitat

**4. Planning/coordination**

- Chesapeake Bay Agreement 2000

**5. Research**

- Comprehensive Coastal Inventory – VIMS

N/A

**5. Planning/coordination**

- Use regional technical staff to supplement local staff
- Develop shoreland planning protocol

**6. Research**

**7. Definition of management targets**

**Strategic Goal B:** Maintain or increase level of environmental protection in permitting process

**Strategic Goal B Measures:**

- Decrease in permitted impacts

**Intermediate Goals:**

1. Provide guidance to localities based on best available science for assessing impacts and setting up mitigation program
2. Monitor impacts from existing shoreline construction
3. Promulgate regulations regarding specific types of shoreline activities

**Intermediate Goal Measures:**

- Increase in percentage of area inventoried and classified by coastal conditions for use in permitting
- Increase in number of research programs addressing impacts from existing shoreline construction

**EXISTING PROGRAMS:**

**1. Outreach**

- Marina guidelines
- Mitigation/compensation guidelines
- SEAS
- VIMS educational programs
- Watershed based regional offices – DCR
- Wetland and dunes guidelines

**2. Regulation**

- CBLAD
- Dunes permitting
- Subaqueous lands permitting
- Local Zoning
- Non-tidal wetlands program – DEQ
- Tidal Wetlands Act (VMRC/ local

**MISSING ELEMENTS:**

**1. Outreach**

- Develop compensation/mitigation guidance/standards for local governments
- Expand regional technical support staffs to assist local governments (consider PDCs)
- Enhance education materials to explain shoreline changes that can occur from improper use of bulkheads, breakwaters, sea walls, etc.

**2. Regulation**

- Move to web-based regulatory programs to enhance coordination and efficiency
- Expand regional technical resources for regulatory program support (e.g. PDCs as mitigation bank managers)

government)

10. Identify options for improving surface water quality and/or instream & riparian habitats

11. Full implementation and enforcement of CBPA 100' buffer requirement

N/A

**3. Authority**

- Require engineering review of coastal structures
- Require local implementation of state standards for regulatory processes (include state oversight)

**3. Monitoring**

- VIMS permit tracking

**4. Monitoring**

- Track increase/decrease in habitat

**4. Planning/coordination**

- Chesapeake Bay Agreement 2000

**5. Planning/coordination**

- Use regional technical staff to supplement local staff
- Develop resource management plans for all localities (e.g., wetlands preservation)
- Develop shoreland planning protocol

**5. Research**

- Comprehensive Coastal Inventory - VIMS

**6. Research**

- Expand knowledge of development impacts on coastal systems (particularly shoreline structures, and riparian land use conversions)

N/A

**7. Definition of management targets**

**Strategic Goal C:** Response to shoreline permit applications done in a timely manner.

**Strategic Goal C Measures:**

- Decrease in time of permit assessment completion

**Intermediate Goals:**

1. Assess efficiency of permitting process, eliminate unnecessary delays
2. Educate public on proper permit application procedure
3. Provide adequate staffing to handle permit case loads

**Intermediate Goal Measures:**

- Increase in number of outreach programs for permitting procedure education
- Increase in percentage of permits completed in desired timeline

**EXISTING PROGRAMS:**

**1. Outreach**

- Marina guidelines
- Mitigation/compensation guidelines
- SEAS
- VIMS educational programs
- Watershed based regional offices - DCR
- Wetland and dunes guidelines

**2. Regulation**

- CBLAD
- Dunes permitting
- Subaqueous lands permitting
- Local Zoning
- Non-tidal wetlands program - DEQ
- Tidal Wetlands Act (VMRC/ local gov't)

N/A

**3. Monitoring**

**4. Planning/coordination**

- Chesapeake Bay Agreement 2000

**5. Research**

- Comprehensive Coastal Inventory - VIMS

N/A

**MISSING ELEMENTS:**

**1. Outreach**

**2. Regulation**

- Move to web-based regulatory programs to enhance coordination and efficiency
- Identify options for improving surface water quality and/or instream & riparian habitats
- Full implementation and enforcement of CBPA 100' buffer requirement

**3. Authority**

**4. Monitoring**

**5. Planning/coordination**

- Use regional technical staff to supplement local staff

**6. Research**

**7. Definition of management targets**

**Strategic Goal D:** Appropriate mitigation process to compensate for losses.

**Strategic Goal D Measures:**

- Increase in Mitigation compliance
  - Area as built v/s required
  - type as built v/s required

*There are no intermediate goals identified*

## **EXISTING PROGRAMS:**

### **1. Outreach**

- Marina guidelines
- Mitigation/compensation guidelines
- SEAS
- VIMS educational programs
- Watershed based regional offices - DCR
- Wetland and dunes guidelines

### **2. Regulation**

- CBLAD
- Dunes permitting
- Subaqueous lands permitting
- Local Zoning
- Non-tidal wetlands program - DEQ
- Tidal Wetlands Act (VMRC/ local gov't)

N/A

### **3. Monitoring**

### **4. Planning/coordination**

- Chesapeake Bay Agreement 2000

### **5. Research**

- Comprehensive Coastal Inventory - VIMS

## **MISSING ELEMENTS:**

### **1. Outreach**

- Develop compensation/mitigation guidance/standards for local governments
- Expand regional technical support staffs to assist local governments (consider PDCs)

### **2. Regulation**

- Expand regional technical resources for regulatory program support (e.g. PDCs as mitigation bank managers)
- Identify options for improving surface water quality and/or instream & riparian habitats
- Full implementation and enforcement of CBPA 100' buffer requirement

### **3. Authority**

- Increase use of in-lieu fees for mitigation/compensation
- Require local implementation of state standards for regulatory processes (include state oversight)

### **4. Monitoring**

- Track increase/decrease in habitat

### **5. Planning/coordination**

- Ensure compensation of cumulative impacts through management/coordination of individual project requirements
- Develop shoreland planning protocol

### **6. Research**

- Expand knowledge of development impacts on coastal systems (particularly shoreline structures, and riparian land



use conversions).

N/A

## 7. Definition of management targets

### **REACH**

Public officials

Voters

Shoreline property owners

Developers, consultants, contractors

Wetland boards

### **Reach measures:**

- Proportion of reach participating in outreach programs

### **CONTEXT**

Sea level rise

Erosion

Subsidence

Water withdrawal

Politics

Private property rights

Funding levels

Population growth

**23/24 To provide private citizens and public officials with technical advice and education necessary to make sound decisions regarding uses of and impacts on coastal resources**

**Strategic Goal A:** Technical advice delivered to citizen and public decision makers as and when they need it to make appropriate decisions on coastal resource use

**Strategic Goal A Measures:**

- Survey of coastal managers to assess technical advice and education needs and adequacy of current availability

**Intermediate Goals:**

1. Assess resource use for technical assistance needs
2. Provide appropriate publications, notifications, classes, etc as necessary
3. Ensure sufficient number of qualified staff available to handle technical assistance needs on a case by case basis
4. Ensure accessibility to technical advice personnel and information

**Intermediate Goal Measures:**

*None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- Boater Education – Coast Guard
- CBLAD education
  - training
  - publications
  - Low impact development workshops
- CBLAD GIS
- CBLAD Technical Assistance Program
- Chesapeake Bay Program
- Citizen Watershed groups
- Coastal Program
- Conservation Reserve Enhancement Program –DCR
- DOF-Harvesting and BMP implementation activities
- E&S DCR
- CBNERRS educational programs
- NPS education - DCR
- SEAS –DCR
- SWM – DCR
- Clean Marina Technical Assistance Program
- State/local environmental ed. programs
- Sustainable Futures Conference –DEQ
- VIMS education programs

**MISSING ELEMENTS:**

**1. Outreach**

- Develop programs for delivery of current environmental condition information, impact assessment (environmental and economic) regulatory protocols
- Expand use of computer and internet delivery mechanisms
- Increase use of print and broadcast media

**2. Regulation**

N/A

**3. Monitoring**

- Alliance citizen monitoring
- CBNERRS monitoring
- Ches Bay monitoring – DEQ
- Polecat creek monitoring
- USGS water quality monitoring
- Virginia Environmental Quality Indicators
- VIMS Shoal Water Quality Monitoring
- VIMS permit tracking

**4. Planning/coordination**

- CBP water quality models
- Environmental Impact Review – DEQ
- Soil and Water Conservation Districts
- Submerged Minerals Management Plan
- Virginia Outdoors Plan
- Wetlands Boards

**5. Research**

- Comprehensive Coastal Inventory - VIMS
- Natural Heritage Inventory- DCR
- SAV Maps- VIMS

N/A

**REACH**

Public

Public officials

Decision makers

Developers, consultants, contractors

**2. Regulation**

**3. Authority**

- Reduce number of activities exempt from permitting/review
- Increase use of in-lieu fees for mitigation/compensation

**4. Monitoring**

**5. Planning/coordination**

- Move to web-based regulatory programs to enhance agency coordination and efficiency

**6. Research**

- Expand knowledge of ecological values of shallow waters and riparian habitats
- Expand knowledge of development impacts on coastal systems (particularly shoreline structures, and riparian land-use conversions)

**7. Definition of management targets**

Media  
Research Community  
Landowners  
Tourists  
Real estate community  
Wetland Boards  
Newspaper reporters

**Reach measures:**

- Proportion of reach participating in outreach programs

**CONTEXT**

Use conflicts  
Political reality  
Private property rights

**25. To develop, improve and maintain base data, maps, and photoimagery, accessible and supportive of decision-makers' needs**

**Strategic Goal A:** Necessary support data available to make informed decisions regarding coastal resource use

**Strategic Goal A Measures:**

- Survey of coastal managers to assess data needs and adequacy of existing availability

**Intermediate Goals:**

1. Determine types of data necessary for addressing coastal resource management needs
2. Establish repository library
3. Determine appropriateness, comprehensiveness, adequacy and “up-to-date-ness” of existing data and materials
4. Engage the necessary resources to provide needed data and materials

**Intermediate Goal Measures:**

*None identified*

**EXISTING PROGRAMS:**

**1. Outreach**

- CBLAD GIS
- DCR- DNH partnerships with agencies and localities for resource maps
- EDP digital/GIS data
- Fish and wildlife Information Service – DGIF
- NGO databases- Native Plant Society, Herp. society, etc
- PDC GIS network
- VGIN
- Virginia Outdoors Plan planning process and maps

**2. Regulation**

N/A

**3. Monitoring**

- Alliance citizen monitoring
- CBNERRS monitoring
- Ches Bay monitoring – DEQ
- Polecat creek monitoring
- USGS water quality monitoring
- VIMS Shoal Water Quality Monitoring

**MISSING ELEMENTS:**

**1. Outreach**

- Develop effective distributive system for serving data

**2. Regulation**

**3. Authority**

**4. Monitoring**

- Design and implement routine base data

**4. Planning/coordination**

- CBP water quality models

**5. Planning/coordination**

- Establish/manage data acquisition programs (address scale, accuracy, funding and infrastructure)
- Develop protocols for distributed data system (metadata, use policies)
- Develop and maintain interagency cooperation

**5. Research**

- Biota of Virginia
- Comprehensive Coastal Inventory –VIMS
- Wetlands Program - VIMS
- Conservation Management Institute databases
- Natural Heritage Information Management Program- DCR
- SAV Maps – VIMS
- VGIN

**6. Research**

N/A

**7. Definition of management targets**

**REACH**

Decision makers (need to show how powerful the tools are)

Builders/developers/ contractors/consultants

Public

Private consulting firms

Local Government

Database/map producers

Agencies:

VDOT

VEDP

DEQ monitoring

MME

VMRC

DCR

VGIN

VIMS

UVA

VA Tech

ODU

**Reach measures:**

- Proportion of reach participating in outreach programs

## **CONTEXT**

Lack of funding

Lack of coordination – need to share capabilities ( not enough resources for everyone to have)

Lack of understanding – what is the value of collecting the data

Intellectual property issues

## **APPENDIX A**



The following list of measures is a compilation of all the strategic and intermediate measures from the 25 goals. The measures have been divided into two categories: performance indicators which may be used to assess the management, or processes integral to the management, of coastal resources; and, outcome measures (the results of the management efforts). There are a total of 61 performance measures and 72 outcome measures. The performance measures are further divided into categories based on the type of process involved, and the outcome measures are divided into categories based on the affected resource.

## Measures

### Performance Indicators

#### **Implementation**

Number of total maximum daily loads (tmdl's) implemented (goal 1,2,15,18)  
Increase in number and extent of comp plans with integrated consideration of coastal resources (goals 1,10,17)  
Increase in number of comp plans implemented (1)  
Reduction in RPA variances (2)  
Increase in number of Best Management Practices (BMPs) (goal 1,2,9)  
Increase in percentage of spill contained/cleaned up (3)  
Increase in the number of hazardous material clean-ups, "round-ups" (3)

#### **Permitting**

Decrease in the number of wetland permits issued (goal 1,6)  
Decrease in area of wetland impacts permitted (goal 1,6,18,20)  
Decrease in submerged land area impacted through permitting process (to 0) (7,20)  
Decrease in sensitive area dredging (to 0) (7)  
Compliance of dredging activities to time of year restrictions (7)  
Decreasing trend in number of permits for new development (1,3)  
Increasing trend in permits for redevelopment (1)  
Increase in number of developments using LID (Low Impact Development) (1)  
Decrease in number of permits for reconstruction after loss due to erosive conditions (or events) (12)  
Decrease in dune area impacted through the permit process (11)  
Increase in number of dune acres under management (jurisdictional) (11)

#### **Compliance**

Decrease in number of RPA violations (goal 1,2,12,16)  
Increase in percentage of compliance with environmental regulatory programs (2)  
Increase percent compliance with E&S law (to 100%) (goals 2,9)  
Increase in compliance with wetland mitigation plans (6)  
Increase Number of 5 year septic pump-outs (1)  
Increase in percent permit compliance for mineral extraction projects (to 100%) (20)

Decrease in number of forestry violations (1)  
Decrease in number of water quality violations (1)

### **Planning**

Increase in number of agricultural conservation plans (1)  
Increase in percent of shoreline covered by management plans (12)  
Increase in percentage of coastal zone inventoried and classified for environmental and economic parameters (6,7,10,11,12,13,14,16,17,19,20)  
Increase in percentage of area identified and inventoried for restoration (10)  
Increase in percentage of resources under management plans (14)  
Increase in number of flood evacuation and/or mitigation projects (13)  
Increase in number of adopted and implemented multi-species management plans (8,18)  
Increase in percentage of coastal area of state covered by watershed management programs (2)  
Improve coordination of site selection process with environmental review (3)

### **Monitoring**

Increase in water quality monitoring (areal and temporal) (goal 1,2,15)  
Increase in monitoring of toxic releases (3)  
Increase in monitoring of shellfish health (5)

### **Funding**

Increase in number and funding for projects to develop new cleanup technology and techniques (3)  
Increase in funding for submerged lands restoration programs (7)  
Increase in funding for (flood) evacuation and/or mitigation projects (13)  
Increase in funding for oil and gas exploration and production off the Atlantic Coast (19)  
Increase in funding for acquisition and upgrades (of recreational property) (21)  
Increase in funding for habitat restoration projects (10)  
Increase in funding for dune restoration projects (11)

### **Preservation**

Increase in number of dune acres preserved (11)  
Increase in the amount of (coastal) area preserved in easements or fee-simple acquisition (1)  
Increase in wetland area permanently protected (goal 1,6)  
Increase in riparian area permanently protected (1)  
Increase in area of submerged lands designated impact restricted areas (easements and zoning) (7)  
Increase in number of miles of protected shoreline in natural geomorphic condition (9)  
Increase in area of land preserved for identified natural communities and rare species habitat (10)  
Increase in dune area in impact restricted easements and zoning (11)

### **Restoration**

Increase in the number of submerged lands restoration programs (7)  
Increased number of habitat restoration projects (10)

Increase in area of voluntary wetland restoration/ creation (6)  
Increase in area of oyster restoration (7,18)  
Increase in area of SAV restoration (7)  
Increase in number of miles of restored stream (geomorphic) (9)

### **Education / Outreach**

Proportion of reach participating in outreach programs (1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25)  
Increase in number of outreach programs for permitting procedure education (22)

## **Outcome Indicators**

### **Water**

Increase in waters meeting standards (1,2)  
Decrease in nitrogen to safe levels (1)  
Decrease in TSS to safe levels (1)  
Stable temperature at appropriate level (1)  
Increase in DO (areal and temporal extent) to appropriate levels (1)  
Decrease in fecal coliforms to safe levels (1)  
Reduction in total suspended solids (goal 1,2,9)  
Reduction in stormwater runoff to safe levels (1)  
Decrease in failing septic systems (1)  
Decrease in percentage of aquatic habitat impaired by suspended solids (9)  
Decrease in area characterized by a depressed Index of Benthic Integrity (9)

### **Air**

Reduction in number of ozone alert days (4)  
Reduction in pollutants released to the air (NO<sub>x</sub> and VOC) (4)  
Decrease in acid rain deposition days (4)  
Reduction in size of ozone maintenance for non-attainment areas (4)

### **Humans**

Reduction in area of beach closure advisories (1)  
Decrease in number of human illness reported due to exposure to unsafe waters (1)  
Reduction in number of necessary fish consumption advisories (1)  
Decrease in illnesses due to ingestion of contaminated seafood (to 0) (1)  
Reduction in number of air-quality related human health incidents reported (e.g. asthma cases on high ozone days) (4)  
Decrease in number of deaths and injuries attributed to coastal flooding and storm events (13)  
Decrease in total dollar amount of property loss due to erosion (12)  
Decrease in monetary value of destruction and/or damage due to coastal flooding and storms (13)

Decrease in total property value at risk (12,13)  
Increase in percentage of at-risk area removed from development zoning (13)  
Increase in number of water access sites (Boat ramps, piers, parks, beaches) (21)  
Increase in number of projects to upgrade facilities (21)  
Increase in percentage of localities taking over permitting (to 100%) (22)  
Increase in percentage of permits completed in desired timeline (22)

### **Reach Perception Measures**

Increase in percentage of reach showing improved understanding of pollutants delivered to waterways and their effects on human health (via survey) (1)  
Increase in percentage of reach showing improved understanding of pollutants delivered to waterways and their effects on ecosystems (via survey) (1,2)  
Increase in percentage of reach showing improved understanding of NPS pollutants delivered to waterways and their effects (via survey) (2)  
Increase in percentage of reach showing improved understanding of PS and NPS pollution and its effects on seafood (via survey) (goals 1,2,5,18)  
Increase in percentage of reach showing improved understanding of the effects of potential spills, outfalls, etc. (via survey) (3)  
Increase in percentage of reach showing improved understanding of air quality and its effects on ecosystem health (via survey) (4)  
Increase in percentage of reach showing improved understanding of wetland functions and values (via survey) (6)  
Increase in percentage of reach showing improved understanding of submerged land habitat value (via survey) (7)  
Increase in percentage of reach showing improved understanding of fishing pressures and the importance of ecosystem integrity (via survey) (8,18)  
Increase in percentage of reach showing improved understanding of sedimentation in waterways (via survey) (9)  
Increase in percentage of reach showing improved understanding of natural communities and rare species habitat values (via survey) (10)  
Increase in percentage of reach showing improved understanding of natural communities and rare species habitat values (via survey) (10)  
Increase in percentage of reach showing improved understanding of sand dune values (via survey) (11)  
Increase in percentage of reach showing improved understanding of risks of building in areas of erosion (via survey) (12)  
Increase in percentage of reach showing improved understanding of risks of coastal flooding and storms (via survey) (13)  
Increase in percentage of reach showing improved understanding of coastal resources and development's long term effects (via survey) (16)  
Increase in percentage of reach showing improved understanding of public access issues (via survey) (21)  
Survey of coastal managers to assess technical advice and education needs and adequacy of current availability (23,24)  
Survey of coastal managers to assess data needs and adequacy of existing availability (25)

### **Living Resources**

- Decrease in number of animals with lesions (1)
- Decrease in number of animals/fish stranded/dead due to water quality (1)
- Decrease in percentage of fish cultures showing toxic levels above standards (1)
- Increase in percent of area identified as important designated as Marine Protected Areas (to 100%) (7)
- Increase in miles of forested buffer shoreline (goals 2,9)
- Increase in SAV acreage (1, 7,18)
- Decrease in dune area impacted through trampling/trespassing (11)
- Decrease in area adversely affected by toxicants and hazardous waste (number of sites and areal extent) (3)
- Decrease in response time to spills (3)
- Decrease in amount of toxics released (3)
- No change in area extent of identified natural communities and rare species habitat (10)
- Increase in population inventory numbers (RTE) (10)
- Decrease (to 0) impacts on identified sensitive habitat areas (7)
- No decrease in natural resource availability coupled with a stable or improving economic situation (14)
- Decrease industrial development in pristine area (14)
- Reduction in number and area of shellfish bed closures (5,15)
- Decrease in harvesting in contaminated shellfish beds (to 0) (5,15)
- Increase (to 100%) percentage of aquaculture facilities meeting state health and environmental requirements (15,18)
- Increase in amounts of marketed aquaculture products (15,18)
- Decrease in the amount of non-harvested mortalities (18)
- Decrease in number of commercial species not harvested at OSY (15,18)
- Sustainable wild harvests (no trends) (18)
- Increase in amount of programs aimed at oil and gas exploration and production off the Atlantic Coast (19)
- Decrease in number of endangered animals killed by mining protects (to 0) (20)
- Increase in number of research programs addressing impacts from existing shoreline construction (22)

## **Appendix B**