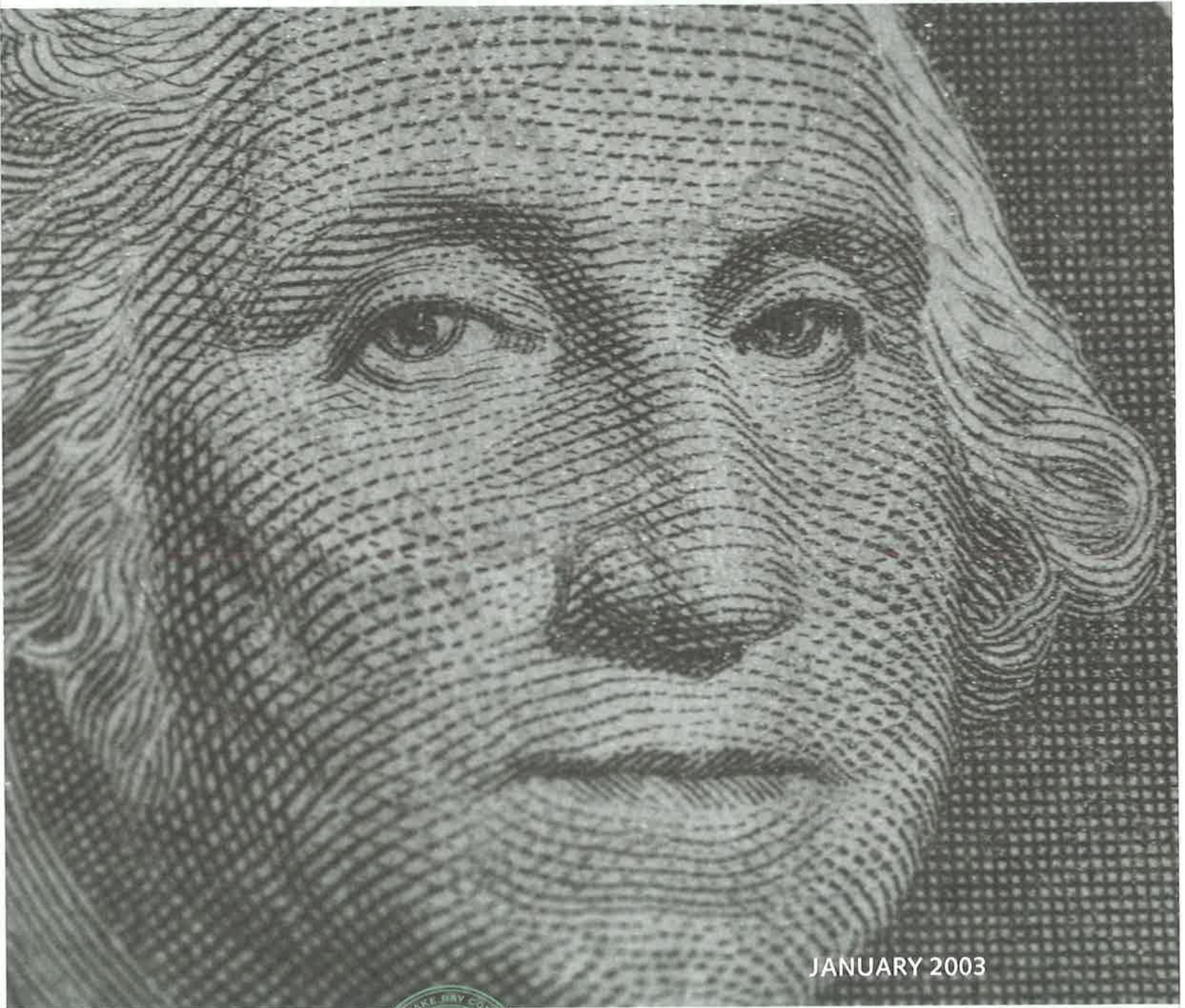


# The Cost of a Clean Bay

*Assessing Funding Needs  
Throughout the Watershed*



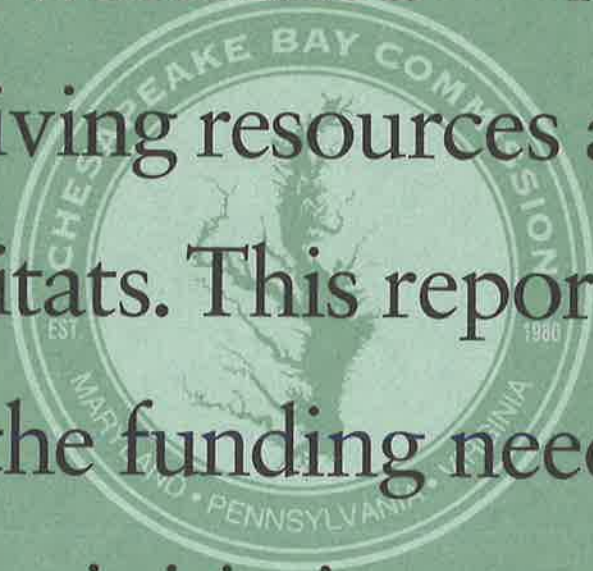
JANUARY 2003



CHESAPEAKE BAY COMMISSION  
*Policy for the Bay*



*Chesapeake 2000* lists more than 100 actions deemed essential to protect and restore the Bay's watershed — its water quality, living resources and vital habitats. This report assesses the funding needed to meet these initiatives and suggests opportunities both to enhance future income and to spend existing funds wisely.



The Cost Of A  
Clean Bay:  
*Assessing  
Funding Needs  
Throughout the  
Watershed*

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## CHAPTER 1

# Introduction

**T**HE CHESAPEAKE BAY COMMISSION is a leader in the restoration of the Chesapeake Bay. As a tri-state legislative assembly representing Maryland, Pennsylvania and Virginia, it was created to coordinate Bay-related policy across state lines and to develop shared solutions.

In 2000, the Commission, along with Maryland, Pennsylvania, Virginia, the District of Columbia, and the U.S. Environmental Protection Agency, signed *Chesapeake 2000* — a regional agreement that reaffirms earlier partnerships while furthering and better defining new initiatives needed to protect and restore the Chesapeake Bay's ecosystem. *Chesapeake 2000*, known as "C2K," now serves as the blueprint for restoration in the region, acting as a guidepost for policy and budgetary activities in the region.

The Commission is now focused on two broad missions: ensuring that policies, regulations and laws are in place to implement *Chesapeake 2000* and finding the funds to get the job done.

In 2002, under the leadership of Chairman Russ Fairchild (R–Pa. House of Representatives), the Commission launched a fiscal analysis of C2K in order to accurately quantify the financial needs associated with a clean Bay — some \$18.7 billion over the next eight years — and to rally the necessary financial support to close a funding gap of nearly \$13 billion. While these numbers are staggering, they must be put in context: The Everglades restoration will cost more than \$15 billion for an area less than one-third the size of the Bay watershed. Furthermore, in 1989, the value of the Bay was estimated at \$678 billion (in 1987 dollars). Clearly, the estimates seem reasonable given the challenges. The question is: Where do we find the funds?

### How the Data Were Collected

**W**orking cooperatively with the states, a comprehensive Baywide estimate of the costs to fulfill the 100-plus goals of the agreement and the likely funding sources to



## The Cost of a Clean Bay

### The Big Picture

<b>Total projected cost</b>	<b>\$18.7 billion</b>
<b>Total projected income</b>	<b>\$5.9 billion</b>
<b>Unfunded gap</b>	<b>\$12.8 billion</b>

Introduction

### Unfunded Gap by State

<b>Maryland</b>	<b>\$2.9 billion</b>
<b>Pennsylvania</b>	<b>\$4.8 billion</b>
<b>Virginia</b>	<b>\$5.1 billion</b>

cover those costs were developed over a six-month period. While other cost estimates have previously been made, this report exceeds those in scope and detail, and is the first of its kind in evaluating the funding gaps associated with meeting the C2K commitments.

This analysis deals with an ecosystem extremely vast and complex, rendering our projections vulnerable to changing conditions and technologies. These are the best numbers we have, but they should not be the last. The estimates contained in this report provide a picture in time. They must be viewed as a fairly accurate estimate — but *only* an estimate. The numbers are subject to change and we welcome any attempt at improvement.

Developing a set of assumptions that were compatible between, and acceptable to, all the states was one of the more challenging aspects of this effort. From the start, we recognized that there would be differences in assumptions regarding the steps necessary to achieve, and the approach needed to accomplish, each goal. With the cooperation of numerous federal and state

colleagues, common ground was won, and the resulting analytical assumptions, while not identical, are similar and comparable.

We hope that this analysis will increase awareness of the support needed to accomplish the goals of the agreement and assist in the development of cost-effective strategies to protect and restore the living resources and vital habitats of the Bay.

Our report contains the following data:

- Cost estimates for achieving the 100-plus commitments for FY 2003-2010 by agreement subcategory. These cost estimates were by fund source and were identified based on historical knowledge of fund sources available in previous years, including:
  - State General
  - State Special
  - State Reimbursable
  - State Capital
  - Federal
  - Local
  - Non-Government



- Anticipated revenue estimates for FY 2003–2010 by agreement subcategory for each fund source, as listed above.
- Basic assumptions used to determine costs and income.

Cost and income data were collected during the summer and fall of 2002 from Pennsylvania and Virginia. Maryland published a financial analysis in February 2002; these findings were incorporated in their entirety, with some changes to reflect more recent information. The District of Columbia was not included because it is not a member of the Commission and its policies and budget are beyond the reach of our members. However, the CBC-developed format is available to the District at any time so that they may develop estimates of their own.

## How the Data Are Organized

The charts and spreadsheets that follow show cost and income information organized by the five major categories and 22 subcategories in the Bay Agreement. In many cases, this information was compiled at the individual commitment level and then aggregated into one of the 22 subcategories. Our effort was intended to be as precise as possible at the subcategory level and was not meant to put a cost to each and every commitment.

The five major categories are:

1. Living Resource Protection and Restoration
2. Vital Habitat Protection and Restoration
3. Water Quality Protection and Restoration
4. Sound Land Use
5. Stewardship and Community Engagement

The 22 subcategories fall within these major categories. For example, Oysters, Exotic Species, Fish Passage, Multi-Species Management, and Crabs are the five subcategories comprising the first major category: Living Resource Protection and Restoration.

State spreadsheets showing cost and income information by C2K subcategory and funding source are shown in Appendix A. The text of all commitments contained in the Agreement is provided in Appendix B.

## Interpretation of Results

### Cost estimates are subject to change

In any budgeting process, long-term out-year cost and income projections are among the most difficult to make. If projections for one or two out-years seem tenuous, then eight-year projections are very risky. One only has to look at both the national and regional economies during the last couple of years to recognize how uncertain projections can be and how quickly they change. Even though the exact amounts may change, this report provides insight into the magnitude and distribution of costs and associated funding shortfalls. It gives all those involved an additional critical tool for the task that lies ahead and allows planning and debate to be structured in a way that helps form sound environmental and public policy.

### Cost assumptions

Every projection was based on the states' assumptions concerning the actions required to attain each commitment. These assumptions, which form the supporting framework for our work, have been compiled by the Commission and are available on our web site: [www.chesbay.state.va.us](http://www.chesbay.state.va.us).

Costs to meet the nutrient and sediment goals of the agreement, which are the single largest cost factor for C2K, were developed in part through the use of data being developed concurrently for the Bay Program as part of the Use Attainability Analysis Technical Support (UAATS). A Use Attainability Analysis is required under the Clean Water Act whenever a water quality standard is made less restrictive. As part of the analysis, states must show scientific, technical, economic or other reasons why the standards cannot be met.

Since *Chesapeake 2000* commits the region to new, and far more stringent, water quality goals, there is an effort underway to revise the standards — strengthening them in the shallows and mid-depth waters while relaxing them in deep areas where scientists have determined them to be unachievable. State and federal Bay officials decided to provide costs and screening level economic analysis to address the new, more stringent water quality standards currently under development for the Chesapeake Bay.

The UAATS calculates costs to the public and private sectors based upon a mix of best management practices (BMPs) that reduce nutrient and sediment loads to the Bay and its rivers. Working with the states, the Bay Program developed three alternative levels (tiers) of BMP implementation in order to evaluate costs and pollution sediment load reductions. Because Tier 3 appears to most closely achieve the necessary reductions, Tier 3 costs for Pennsylvania and Virginia have been used in our analysis.

Since Maryland had conducted an earlier, independent analysis that is generally comparable to Tier 3, their previous cost estimates to meet the nutrient and sediment commitments were used in this report, with one exception — their original septic system estimate was adjusted downward to reflect the estimate of the UAATS.

A direct comparison between our estimates and those of the UAATS is not possible. While we captured all capital costs during the eight-year period remaining on the agreement, the UAATS model reports the data over a longer time frame, typically a financing period for the capital projects. For operating and maintenance costs, we used the estimates provided by Maryland in their earlier report; for Pennsylvania and Virginia, we used the estimates provided by the UAATS.

In the final analysis, the Commission report provides a basic summary of the cost of

implementing C2K and the anticipated income at the time of this publication. It does not, in any way, address the financing of these costs. Those are decisions that loom in the near future.

### **Commitment interaction**

Even though each commitment was calculated independently of all the others, we recognize there may be cost efficiencies resulting from the completion of various commitments. For example, stormwater management reduces stream erosion, thereby reducing stream restoration costs. Gauging the impact of these efficiencies would be extremely difficult and was outside the scope and time frame of this analysis. But we are mindful that such efficiencies might reduce the total cost of implementing the agreement.

### **All costs and sources of funds included**

Estimates for local governments and the private sector are based on the states' knowledge of their programs and level of participation. We recognize these costs and income estimates are basic and subject to fine tuning/adjustments by those sectors. In addition, some commitments involve more than one agency or group; to avoid duplication, every attempt was made to ensure that the costs and the source of the funds were properly identified.

### **Cost containment**

Budget assumptions for FY 2003 and FY 2004 may not include adjustments resulting from cost containment imposed by the states as a means of addressing expected shortfalls for these years.

### **Rounding**

Totals may not add due to rounding.

CHAPTER 2

**Results:**  
*Projected Costs  
 and Income,  
 2003–2010*

**Projected Funding Needs by State**

While the costs of meeting C2K are fairly consistent across the states, projected income over the 8-year period is significantly less in Pennsylvania and Virginia. This results in an especially large funding gap for Virginia and Pennsylvania, where 84 percent and 77 percent, respectively, of projected C2K costs are unfunded. All of the states face significant shortfalls, ranging from \$2.9 billion in Maryland to \$4.8 billion in Pennsylvania and \$5.1 billion in Virginia.

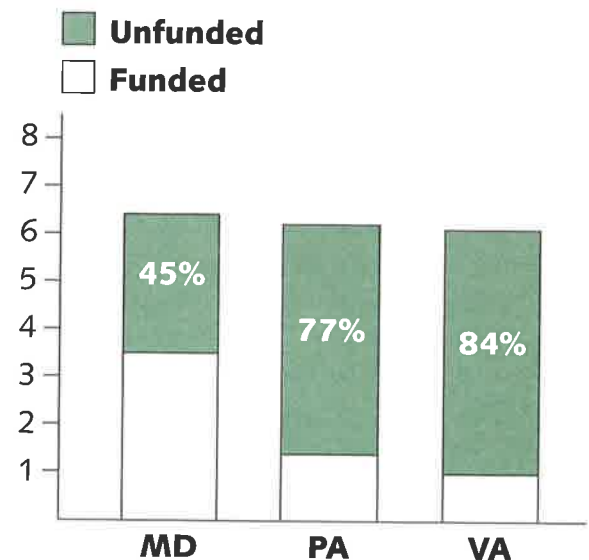


**The Cost of a Clean Bay**

Projected C2K Funding Needs, by State, 2003–10 (in billions of dollars)

	<b>MD</b>	<b>PA</b>	<b>VA</b>	<b>Total</b>
Costs	6.4	6.2	6.1	18.7
Income	3.5	1.4	1.0	5.9
<b>Funding gap</b>	<b>2.9</b>	<b>4.8</b>	<b>5.1</b>	<b>12.8</b>

Projected C2K Funding Gaps By State, 2003–10 (In billions of dollars)





## Projected Costs and Income by C2K Category

Looking across the major subject categories, both overall costs and funding gaps are the highest for attaining our water quality goals. These goals represent 60 percent of the total \$18.7 billion required Baywide, and are also the highest cost component for each of the states. The driving factor behind these costs is the C2K goal of reducing nutrient and sediment loads to levels sufficient to remove the Bay from the federally-imposed list of “Impaired Waters.” The



### The Cost of a Clean Bay

Projected State C2K Costs and Income, by Category (in billions of dollars)

	MD	PA	VA	Total
<b>I. Living Resources</b>				
Cost	0.1	1.2	0.1	1.4
Income	0.1	0.1	0.1	0.2
<b>II. Vital Habitat</b>				
Cost	0.4	0.5	0.1	1.0
Income	0.2	0.2	0.1	0.5
<b>III. Water Quality</b>				
Cost	3.9	3.1	4.5	11.5
Income	1.7	0.2	0.2	2.1
<b>IV. Land Use</b>				
Cost	1.5	1.4	1.3	4.2
Income	1.5	0.9	0.7	3.1
<b>V. Community Engagement</b>				
Cost	0.5	0.1	0.1	0.7
Income	0.1	0.1	0.1	0.1

reported costs include estimates for nutrient and sediment reductions from agricultural lands, septic systems, new and retrofitted stormwater measures, as well as upgrades to wastewater treatment plants. Our analysis reveals that point source controls (i.e., for wastewater treatment plants) are one-half the cost of nonpoint source controls on average throughout the watershed.

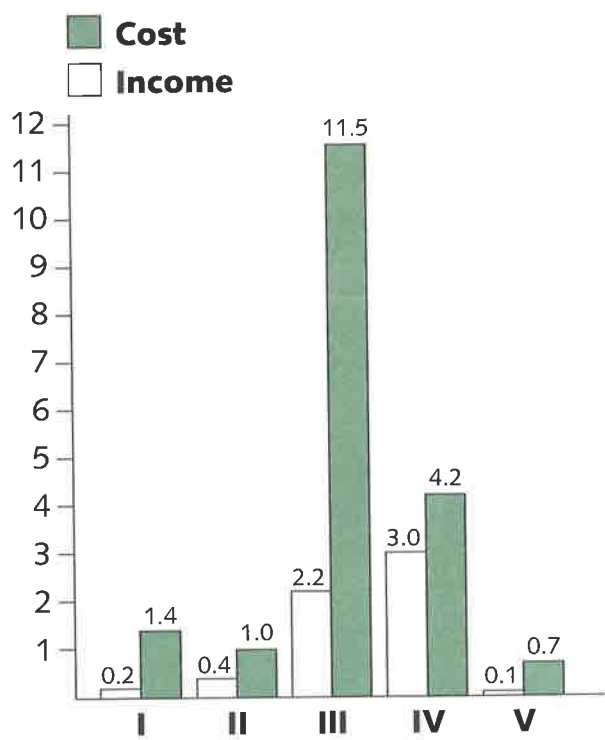
Funding gaps associated with the commitments addressing living resources, vital habitats and community engagement are comparatively low among the states. However, in Pennsylvania, a large funding need associated

Projected Costs and Income, 2003–2010



### The Cost of a Clean Bay

Projected Baywide C2K Costs and Income, by Category (in billions of dollars)

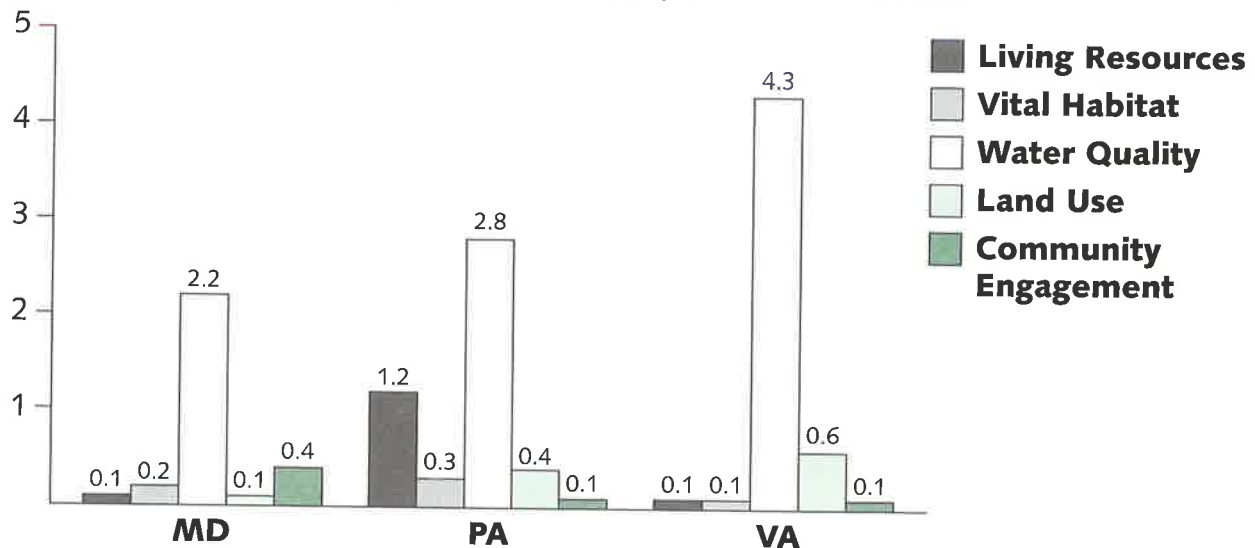




## The Cost of a Clean Bay

Projected C2K Funding Gaps, by State and Category (in billions of dollars)

*Projected Costs and Income, 2003–2010*



with living resources involves removal of chemical blockages due to acid mine drainage and abandoned mine reclamation. Five sites along the west branch of the Susquehanna River, encompassing about 7,700 square miles of drainage area, require remediation at an estimated cost of over \$1 billion.

### Projected Costs and Income by Funding Source

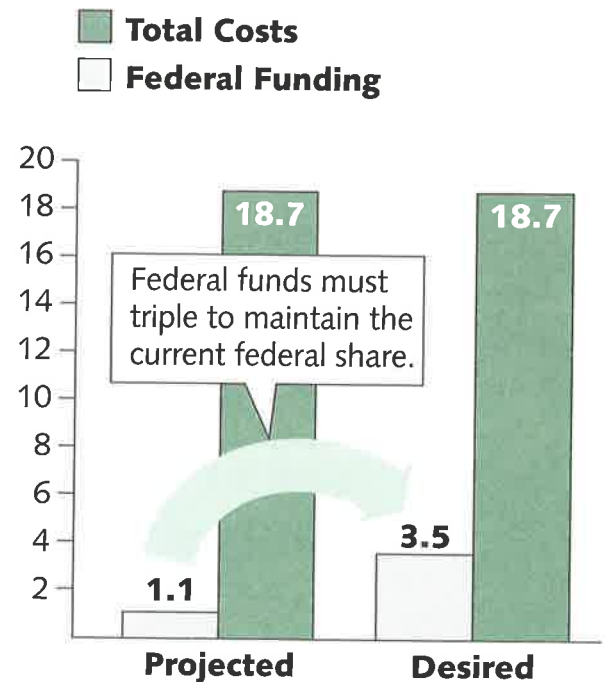
An important part of this analysis was the identification of the mix of funding sources for meeting C2K goals. To a large extent, the projections of future income over the 8-year period were based upon the mix and level of funding in prior years. Based upon past patterns, the federal government can be expected to contribute \$1.1 billion, representing 18 percent of the total \$5.9 billion in projected income received over the 8-year period. This income is not distributed evenly across the states.

Looking at the projected costs for meeting C2K by 2010, the costs projected to be carried by



## The Cost of a Clean Bay

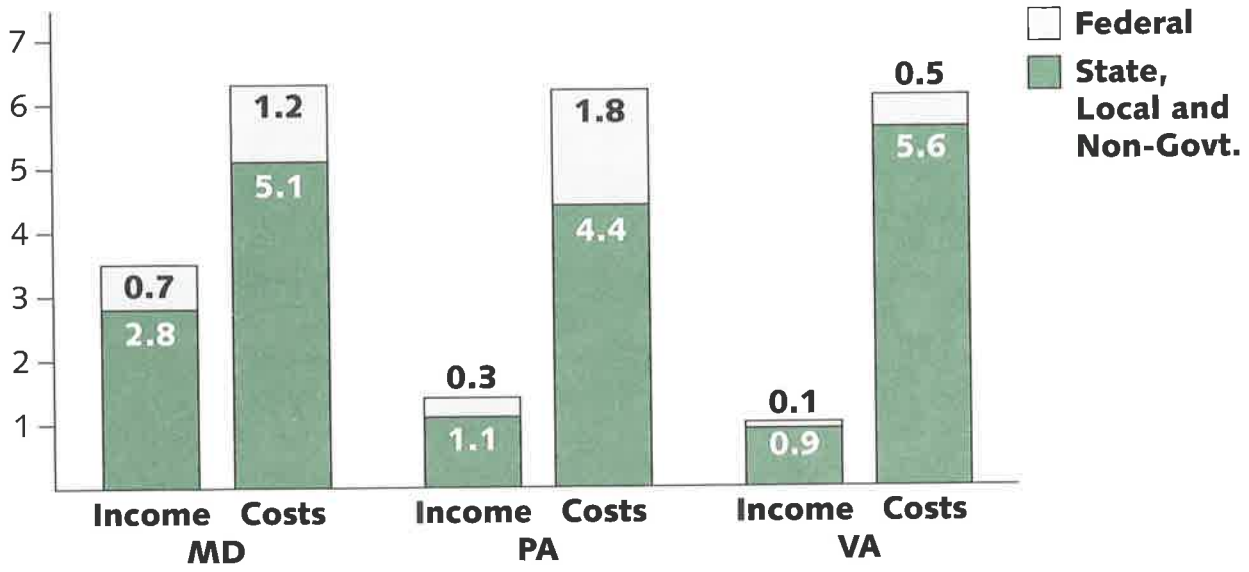
Federal Support as a Percentage of Total C2K Costs (in billions of dollars)





# The Cost of a Clean Bay

Projected C2K Costs and Income, by Funding Source (in billions of dollars)



*Projected Costs and Income, 2003-2010*

the federal government are \$3.5 billion, or approximately 18 percent of the \$18.7 billion in total costs. These costs vary from a low of 9 percent of total C2K costs in Virginia to 19 percent in Maryland and 29 percent in Pennsylvania.

If current patterns continue, and the federal government provides an estimated \$1.1 billion toward the Bay cleanup by 2010, this will

address only 6 percent of total costs for the region. To maintain its existing share of funding for C2K, the federal contribution needs to triple.

Similarly, state and local governments and the private sector must increase their support. Even if the federal government increases its Bay-related funding to cover the estimated \$3.5 billion in projected federal costs, a bill of \$15.3 billion would still remain.

## CHAPTER 3

# Policy Implications and Conclusions

### Strategic Funding: Maximizing Environmental Benefits

**R**ealistically, opportunities for enhanced funding will not be sufficient in the next few years to address all of our C2K needs. It is, therefore, crucial that we target all available funds to maximize environmental benefits. This analysis provides a tool for state policymakers to evaluate their income and spending projections and to develop a strategic plan.

First and foremost, understanding the price tag should not diminish our drive or our expectations. C2K goals were established based on best scientific knowledge. This fiscal analysis provides a cost component to the equation. As our understanding of the pollutant reduction potential of various BMPs expands, we are able to develop measures of cost-effectiveness. Furthermore, modeling results may indicate that a phased approach to meeting key goals is warranted, i.e., achieving water quality improvements may be seen as a prerequisite to the success of certain living resource restoration efforts.

We project \$5.9 billion of income over the next 8 years. What can be accomplished with that money? Probably a lot . . . and even more, if we spend the money wisely.

### Fiscal Responsibility: Starting With Prevention and Protection

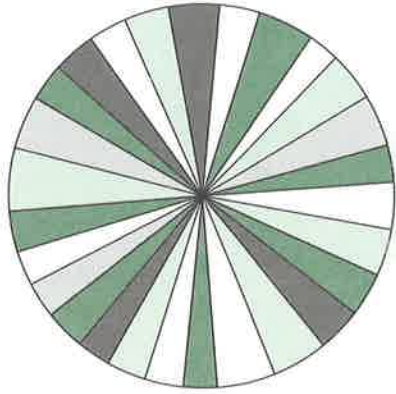
**T**he costs of stream, riparian forest buffer and wetland restoration highlight the burden placed upon state and local governments when resources are allowed to be degraded or destroyed, or when improper safeguards are installed. As we work to replicate the natural ecosystems that have been lost, common sense dictates that we must be vigilant in protecting existing resources from a similar fate.

This underscores the need for full implementation and enforcement of existing laws and programs. It also suggests a targeting of

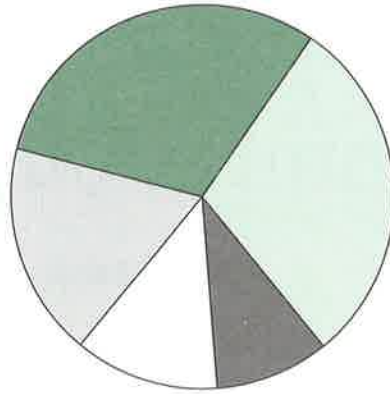




## Do we become more selective, and target keystone commitments . . .



**Strategic Spending**



*Policy Implications and Conclusions*

## . . . providing a logical spending sequence over time?

funds to permanently protect sensitive ecological resource lands.

The importance of natural systems in retaining and filtering pollutants cannot be underestimated, from either an environmental or economic perspective. A study by a national organization, American Forests, of urban tree loss in the D.C. metropolitan region calculated the pollution control benefits provided by its existing urban forest. The metropolitan D.C. area's trees remove 20 million pounds of pollutants from the air each year, a benefit worth \$50 million annually. The ability of trees to absorb stormwater, lessen erosion and reduce peak flow was also analyzed. Urban trees were estimated to retain 949 million cubic feet of water. If these trees were lost and replaced by impervious surfaces, building equivalent retention facilities would cost the region \$4.7 billion.

With stormwater retrofit costs estimated at more than \$2.5 billion across the watershed,

state and local governments must incorporate this kind of analysis into their strategic planning.

Another consideration in protecting the region's "green infrastructure" involves the costs imposed by our land development patterns. Urban sprawl imposes burdensome costs on localities to provide road and school construction, sewer, fire and police services. A 1998 Prince William County, Virginia, report estimated that each new home in the area's low-density fringes cost that locality \$1,600 more than was returned in taxes and other revenues. A recent study by the Chesapeake Bay Foundation reports that, in 1996, Carroll County, Maryland, paid out \$1.22 in services for every \$1 collected from residential property taxes. These development patterns, fueled by population increases in the region, constitute one of the greatest challenges to the Bay restoration effort. Educating the public and municipal planning and zoning officials about the interrelated

“Understanding the cost of a clean Bay should not compromise our goals or diminish our progress.”

*Policy  
Implications  
and  
Conclusions*

**Chesapeake Bay Commission Chairman Russ Fairchild (R-Pa.)**

environmental and economic costs of sprawl must be a priority.

### **Federal Funding: Maximizing the Partnership**

Federal funding is a critical component of C2K accomplishments throughout the watershed to date and the involvement of the federal agencies must be lauded. Overall, the federal government has provided about one-fifth of the expenditures going to C2K activities.

Garnering the necessary political support to provide new federal dollars will require the collective efforts of all Bay program partners. Opportunities exist for enhanced funding

through a variety of federal programs and appropriations bills that address: air and stormwater impacts from transportation; agricultural conservation measures; nutrient reduction upgrades to wastewater treatment plants; shoreline stabilization; environmental education and more.

At a minimum, state and local governments should better utilize existing federal funding programs. Significant discrepancies were reported among the states for federal funding of key watershed programs. These discrepancies should be investigated by the states in order to take full advantage of federal funds available to our region.



## The Bottom Line

- ✓ Despite the short-term fiscal challenges in the region, we must take action to secure the needed funding over the next eight years.
- ✓ Inaction is potentially more costly. Delaying Bay-related expenditures today will result in cleanup costs far in excess of what we have projected.
- ✓ Pollution prevention is far less costly than pollution cleanup. Reducing nutrient and sediment loads must be our highest priority.
- ✓ The value of the watershed's natural filters is immense. Forests, urban tree cover, wetlands, underwater grasses and oysters provide free pollution control services that are costly to replicate with man-made technology.
- ✓ In the near term, we must at least maintain existing programs and funding levels, while identifying new sources of state, local and private funds needed over the eight-year period. Public support and political will are essential.
- ✓ Efforts among the states and within the Bay Program must be strengthened and coordinated to pursue new federal funding opportunities, but we recognize and accept that most of the needed funds will come from the three Bay states and the District of Columbia.
- ✓ The costs of C2K commitments addressing sprawl were the most difficult to calculate. The success of efforts to direct new growth and to minimize the environmental impacts of the watershed's land use patterns will strongly influence future cleanup and restoration costs.

*Policy  
Implications  
and  
Conclusions*

APPENDIX A

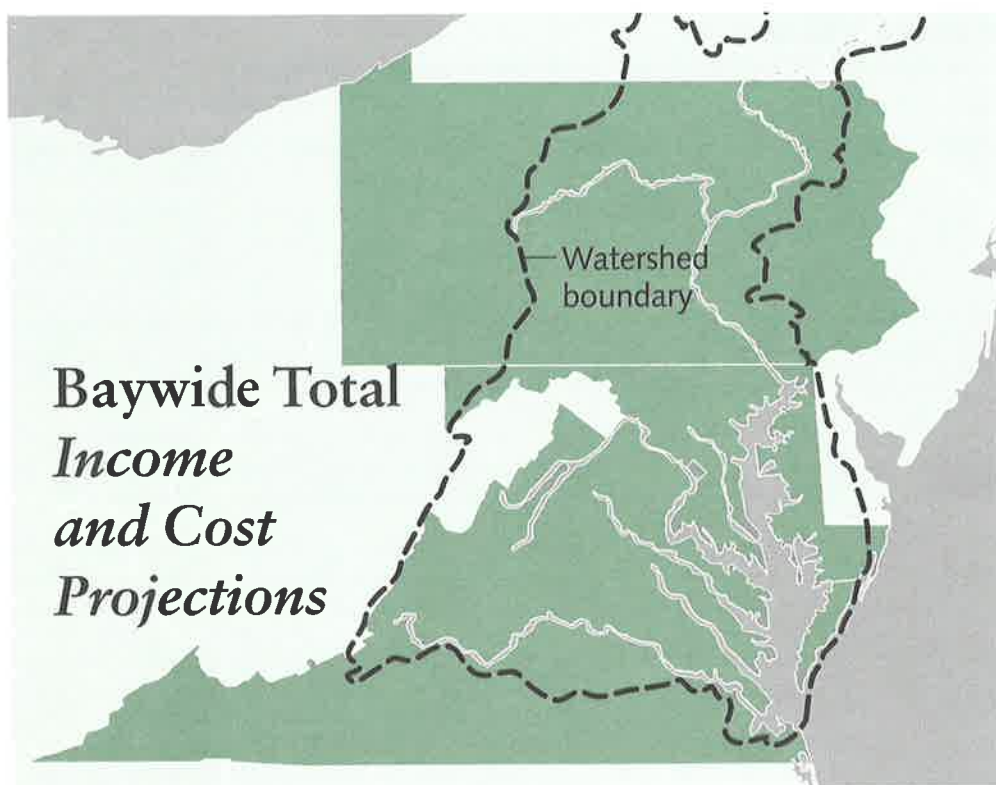
## Costs and Income by C2K Category and Funding Source, 2003–2010

Detailed cost and income information is shown in spreadsheets for the 22 subcategories and five major categories within C2K. Baywide totals are presented first, followed by each state's summary. The spreadsheets show a breakdown of cost and income, by the likely source of funds, which will be needed to achieve the commitments within the subcategory. The funds are shown with the following breakdowns:

- State General Funds
- State Special Funds
- State Capital Budget
- State Other (reimbursable)
- Federal Funds
- Local Funds
- Non-government Funds (including the private business sector, individuals, and non-profit organizations).

Income estimates in the local government and non-government budget categories have been provided only where there was an extensive history of a local or non-government contribution.





### GOAL 1.0 Living Resource Protection and Restoration

Income and cost projections, by revenue source, for Living Resource Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>Oysters</b>								
Income 03-10	90.4	13.6	4.8	12	24	35.2	0.8	0
Cost 03-10	111.6	27.7	6.1	12.1	25.7	39.2	0.8	0
<b>Exotic Species</b>								
Income 03-10	11.1	0.9	4	0	0	6.2	0	0
Cost 03-10	21	9.8	4	0	0	7.2	0	0
<b>Fish Passage &amp; Migratory &amp; Resident Fish</b>								
Income 03-10	52	1.9	8.3	0	9.8	24.5	1.3	6.4
Cost 03-10	1245.5	1.5	21.2	0.8	5	1184.1	1.3	31.6
<b>Multi-species Management</b>								
Income 03-10	6.7	0.2	1	0.6	0	4.9	0	0
Cost 03-10	11.9	2.9	3.4	0.6	0	5	0	0
<b>Crabs</b>								
Income 03-10	10.3	3.8	2.2	0	0	3.5	0	0.8
Cost 03-10	19.6	9.3	4	0	0	5	0	1.3
<b>1.0 Total</b>								
Income 03-10	170.5	20.4	20.3	12.6	33.8	74.3	2.1	7.2
Cost 03-10	1409.6	51.2	38.7	13.5	30.7	1240.5	2.1	32.9

## GOAL 2.0 Vital Habitat Protection and Restoration

Income and cost projections, by revenue source, for Vital Habitat Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>Submerged Aquatic Vegetation</b>								
Income 03-10	6.6	2.1	1.7	0	0	2.8	0	0
Cost 03-10	39.8	23.2	3.6	0	0	13	0	0
<b>Watershed</b>								
Income 03-10	222.1	10.7	0.1	135.2	0	57.7	1.6	16.8
Cost 03-10	633.5	93.4	0	233.6	0	218.2	28.8	59.5
<b>Wetlands</b>								
Income 03-10	115.2	49.1	9.2	0.9	0.9	51.9	1.6	1.6
Cost 03-10	245.7	73.7	41.7	0.8	37.6	82.3	1.6	8
<b>Forests</b>								
Income 03-10	96.7	24.9	1.1	2.7	19.9	34	11.2	2.9
Cost 03-10	109.1	35	1.4	2.7	19.9	34.9	12.3	0
<b>2.0 Total</b>								
Income 03-10	440.6	86.8	12.1	138.8	20.8	146.4	14.4	21.3
Cost 03-10	1028.1	225.3	46.7	237.1	57.5	348.4	42.7	70.4

Appendix A

## GOAL 3.0 Water Quality Protection and Restoration

Income and cost projections, by revenue source for Water Quality Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>Nutrients and Sediments</b>								
Income 03-10	1899	347.4	44.9	0	240.2	665.5	300.8	300.2
Cost 03-10	10807.5	1233.4	46.6	0	958.6	1739.3	5341.6	1488
<b>Chemical Contaminants</b>								
Income 03-10	149	76.1	33.1	0.8	0	39	0	0
Cost 03-10	515.2	86.1	34.7	45.8	300	48.6	0	0
<b>Priority Urban Waters</b>								
Income 03-10	17.1	8.8	0	0	0	8.3	0	0
Cost 03-10	44.8	13.8	0	17.4	0	12.3	1.3	0
<b>Air Pollution</b>								
Income 03-10	82.8	18.7	51.3	0	0	12.8	0	0
Cost 03-10	82.8	18.7	51.3	0	0	12.8	0	0
<b>Boat Discharge</b>								
Income 03-10	7.2	0	1.6	0	0	4.8	0	0.8
Cost 03-10	8.1	0.3	1.9	0.6	0	4.8	0	0.5
<b>3.0 Total</b>								
Income 03-10	2155.1	451	130.9	0.8	240.2	730.4	300.8	301
Cost 03-10	11458.4	1352.3	134.5	63.8	1258.6	1817.8	5342.9	1488.5

**GOAL 4.0 Sound Land Use**

Income and cost projections, by revenue source, for Sound Land Use (in millions of dollars)

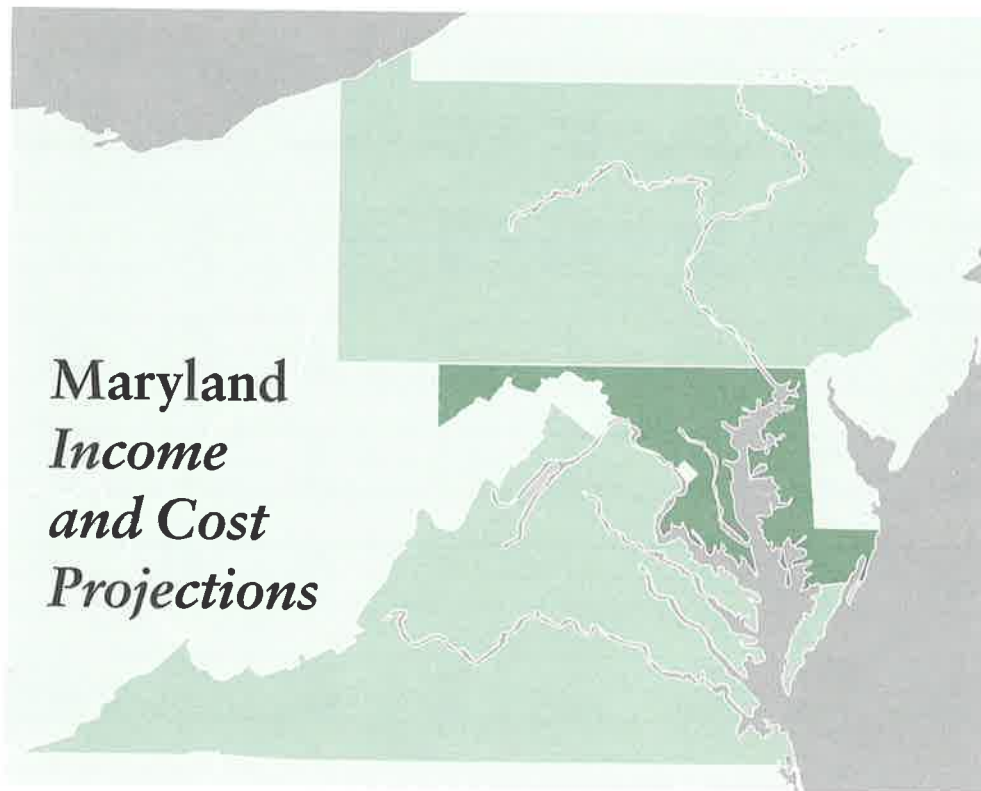
	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>Land Conservation</b>								
Income 03-10	1072.7	98.2	374.6	236.5	148	47.9	167.5	0
Cost 03-10	1773	17.6	367.7	1033.6	100	73.5	180.6	0
<b>Development, Redevelopment, Revitalization</b>								
Income 03-10	591.8	147.5	196.1	0.8	12.8	44.1	165.2	25.3
Cost 03-10	974.9	259	208.7	32	1.6	43.1	165.2	265.3
<b>Transportation</b>								
Income 03-10	1305.1	29.5	1275.2	0	0	0.4	0	0
Cost 03-10	1305.1	29.5	1275.2	0	0	0.4	0	0
<b>Public Access</b>								
Income 03-10	76.6	2.1	42	0.1	0.8	10.8	20.8	0
Cost 03-10	107.3	2.1	53	0.1	7.1	19.3	25.7	0
<b>4.0 Total</b>								
Income 03-10	3046.2	277.3	1887.9	237.4	161.6	103.2	353.5	25.3
Cost 03-10	4160.3	308.2	1904.6	1065.7	108.7	136.3	371.5	265.3

Appendix A

**GOAL 5.0 Stewardship and Community Engagement**

Income and cost projections, by revenue source, for Stewardship and Community Engagement (in millions of dollars)

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>Education and Outreach</b>								
Income 03-10	22.3	21	0.3	0	0	1	0	0
Cost 03-10	148.2	140.6	0.5	0.2	0	6.9	0	0
<b>Community Engagement</b>								
Income 03-10	26.7	11.6	0	5.6	0	4.2	2.4	2.9
Cost 03-10	112.1	82.8	0.3	15.6	0	3.7	2.6	7.1
<b>Government by Example</b>								
Income 03-10	12.6	6.2	2.4	5.6	0	2.4	0	0.8
Cost 03-10	401.3	7.2	5	0.2	267.4	2.4	119.1	0
<b>Partnerships</b>								
Income 03-10	0.1	0.1	0	0	0	0	0	0
Cost 03-10	0.1	0.1	0	0	0	0	0	0
<b>5.0 Total</b>								
Income 03-10	61.7	38.9	2.7	5.6	0	7.6	2.4	3.7
Cost 03-10	661.7	230.7	5.8	16	267.4	13	121.7	7.1



### GOAL 1.0 Living Resource Protection and Restoration

Income and cost projections, by revenue source, for Living Resource Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>.1 Oysters</b>								
Income 03-10	64	8	4	12	24	16	0	0
Cost 03-10	71.6	8.5	5.3	12.1	25.7	20	0	0
<b>1.2 Exotic Species</b>								
Income 03-10	11	0.8	4	0	0	6.2	0	0
Cost 03-10	13	2	4	0	0	7	0	0
<b>1.3 Fish Passage &amp; Migratory &amp; Resident Fish</b>								
Income 03-10	14.4	0.8	2.4	0	4.8	4.8	0	1.6
Cost 03-10	23.9	0.4	10	0.2	0	11.5	0	1.8
<b>1.4 Multi-species Management</b>								
Income 03-10	0.8	0	0	0	0	0.8	0	0
Cost 03-10	1.7	0.8	0	0	0	0.9	0	0
<b>1.5 Crabs</b>								
Income 03-10	8	2.4	1.6	0	0	3.2	0	0.8
Cost 03-10	11.7	5.6	1.6	0	0	3.2	0	1.3
<b>1.0 Total</b>								
Income 03-10	98.2	12	12	12	28.8	31	0	2.4
Cost 03-10	121.9	17.3	20.9	12.3	25.7	42.6	0	3.1



**GOAL 2.0 Vital Habitat Protection and Restoration**

Income and cost projections, by revenue source, for Vital Habitat Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>2.1 Submerged Aquatic Vegetation</b>								
Income 03-10	1.6	0.8	0	0	0	0.8	0	0
Cost 03-10	29.1	20.4	0	0	0	8.7	0	0
<b>2.2 Watersheds</b>								
Income 03-10	10.4	5.6	0	0	0	3.2	1.6	0
Cost 03-10	110.6	12.1	0	0	0	69.5	28.8	0.2
<b>2.3 Wetlands</b>								
Income 03-10	80.9	24.6	9.2	0.9	0.9	42.1	1.6	1.6
Cost 03-10	157.6	24	16	0.8	37.6	69.6	1.6	8
<b>2.4 Forests</b>								
Income 03-10	92.7	24.9	1.1	0	19.9	32.8	11.2	2.8
Cost 03-10	99.1	28.8	1.4	0	19.9	33.9	12.3	2.8
<b>2.0 Total</b>								
Income 03-10	185.6	55.9	10.3	0.9	20.8	78.9	14.4	4.4
Cost 03-10	396.4	85.3	17.4	0.8	57.5	181.7	42.7	11

Appendix A

**GOAL 3.0 Water Quality Protection and Restoration**

Income and cost projections, by revenue source for Water Quality Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>3.1 Nutrients and Sediments</b>								
Income 03-10	1537.2	161.6	19.2	0	240.2	515.2	300.8	300.2
Cost 03-10	3384.2	405.2	20.9	0	907.7	926.2	588.7	535.5
<b>3.2 Chemical Contaminants</b>								
Income 03-10	109.6	56	25.6	0.8	0	27.2	0	0
Cost 03-10	464.9	56.3	27.2	45.8	300	35.6	0	0
<b>3.3 Priority Urban Waters</b>								
Income 03-10	8.8	8.8	0	0	0	0	0	0
Cost 03-10	30.2	8.8	0	17.4	0	4	0	0
<b>3.4 Air Pollution</b>								
Income 03-10	0.4	0	0.3	0	0	0.1	0	0
Cost 03-10	0.4	0	0.3	0	0	0.1	0	0
<b>3.5 Boat Discharge</b>								
Income 03-10	7.2	0	1.6	0	0	4.8	0	0.8
Cost 03-10	8.1	0.3	1.9	0.6	0	4.8	0	0.5
<b>3.0 Total</b>								
Income 03-10	1663.2	226.4	46.7	0.8	240.2	547.3	300.8	301
Cost 03-10	3887.8	470.6	50.3	63.8	1207.7	970.7	588.7	536

**GOAL 4.0 Sound Land Use**

Income and cost projections, by revenue source, for Sound Land Use (in millions of dollars)

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>4.1 Land Conservation</b>								
Income 03-10	535.1	80.6	321	0	133	0.5	0	0
Cost 03-10	541.6	0	321.3	91.6	85	26.1	17.6	0
<b>4.2 Development, Redevelopment and Revitalization</b>								
Income 03-10	28	8	4	0.8	12.8	2.4	0	0
Cost 03-10	53.2	12	6.2	32	1.6	1.4	0	0
<b>4.3 Transportation</b>								
Income 03-10	846.5	0	846.5	0	0	0	0	0
Cost 03-10	846.5	0	846.5	0	0	0	0	0
<b>4.4 Public Access</b>								
Income 03-10	58.4	0	38.4	0	0.8	2.4	16.8	0
Cost 03-10	66	0	43	0	2.1	2.4	18.5	0
<b>4.0 Total</b>								
Income 03-10	1468	88.6	1209.9	0.8	146.6	5.3	16.8	0
Cost 03-10	1507.3	12	1217	123.6	88.7	29.9	36.1	0

Appendix A

**GOAL 5.0 Stewardship and Community Engagement**

Income and cost projections, by revenue source, for Stewardship and Community Engagement (in millions of dollars)

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>5.1 Education and Outreach</b>								
Income 03-10	17.6	17.6	0	0	0	0	0	0
Cost 03-10	49	42.7	0.2	0.2	0	5.9	0	0
<b>5.2 Community Engagement</b>								
Income 03-10	7.2	0.8	0	0	0	3.2	2.4	0.8
Cost 03-10	12.4	4.6	0.3	0.3	0	3.7	2.6	0.9
<b>5.3 Government by Example</b>								
Income 03-10	9.6	3.2	2.4	0	0	2.4	0	0.8
Cost 03-10	398.3	4.2	5	0.2	267.4	2.4	119.1	0
<b>5.4 Partnerships</b>								
Income 03-10	0.1	0.1	0	0	0	0	0	0
Cost 03-10	0.1	0.1	0	0	0	0	0	0
<b>5.0 Total</b>								
Income 03-10	34.5	21.7	2.4	0	0	5.6	2.4	1.6
Cost 03-10	459.8	51.6	5.5	0.7	267.4	12	121.7	0.9

# Pennsylvania Income and Cost Projections

Appendix A

## GOAL 1.0 Living Resource Protection and Restoration

Income and cost projections, by revenue source, for Living Resource Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>1.1 Oysters</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	0	0	0	0	0	0	0	0
<b>1.2 Exotic Species</b>								
Income 03-10	0.1	0.1	0	0	0	0	0	0
Cost 03-10	3.2	3	0	0	0	0.2	0	0
<b>1.3 Fish Passage &amp; Migratory &amp; Resident Fish</b>								
Income 03-10	17.1	1.1	1.7	0	5	3.4	1.3	4.8
Cost 03-10	1189	1.1	1.7	0	5	1150.1	1.3	29.8
<b>1.4 Multi-species Management</b>								
Income 03-10	0.1	0	0.1	0	0	0	0	0
Cost 03-10	0.1	0	0.1	0	0	0	0	0
<b>1.5 Crabs</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	0	0	0	0	0	0	0	0
<b>1.0 Total</b>								
Income 03-10	17.3	1.2	1.8	0	5	3.4	1.3	4.8
Cost 03-10	1192.3	4.1	1.8	0	5	1150.3	1.3	29.8

**GOAL 2.0 Vital Habitat Protection And Restoration**

Income and cost projections, by revenue source, for Vital Habitat Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>2.1 Submerged Aquatic Vegetation</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	0	0	0	0	0	0	0	0
<b>2.2 Watersheds</b>								
Income 03-10	207.2	0.8	0	135.2	0	54.4	0	16.8
Cost 03-10	442.6	1	0	233.6	0	148.7	0	59.3
<b>2.3 Wetlands</b>								
Income 03-10	13	13	0	0	0	0	0	0
Cost 03-10	38.7	13	25.7	0	0	0	0	0
<b>2.4 Forests</b>								
Income 03-10	3.8	0	0	2.7	0	1	0	0.1
Cost 03-10	3.8	0	0	2.7	0	1	0	0.1
<b>2.0 Total</b>								
Income 03-10	224	13.8	0	137.9	0	55.4	0	16.9
Cost 03-10	485.1	14	25.7	236.3	0	149.7	0	59.4

Appendix A

**GOAL 3.0 Water Quality Protection and Restoration**

Income and cost projections, by revenue source, for Water Quality Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>3.1 Nutrients and Sediments</b>								
Income 03-10	246.5	115	0	0	0	131.5	0	0
Cost 03-10	3067.8	410.7	0	0	0	411.2	1764.1	481.8
<b>3.2 Chemical Contaminants</b>								
Income 03-10	1	0.2	0	0	0	0.8	0	0
Cost 03-10	4	2	0	0	0	2	0	0
<b>3.3 Priority Urban Waters</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	0	0	0	0	0	0	0	0
<b>3.4 Air Pollution</b>								
Income 03-10	1.8	0	1.3	0	0	0.5	0	0
Cost 03-10	1.8	0	1.3	0	0	0.5	0	0
<b>3.5 Boat Discharge</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	0	0	0	0	0	0	0	0
<b>3.0 Total</b>								
Income 03-10	249.3	115.2	1.3	0	0	132.8	0	0
Cost 03-10	3073.6	412.7	1.3	0	0	413.7	1764.1	481.8



**GOAL 4.0 Sound Land Use**

Income and cost projections, by revenue source, for Sound Land Use (in millions of dollars)

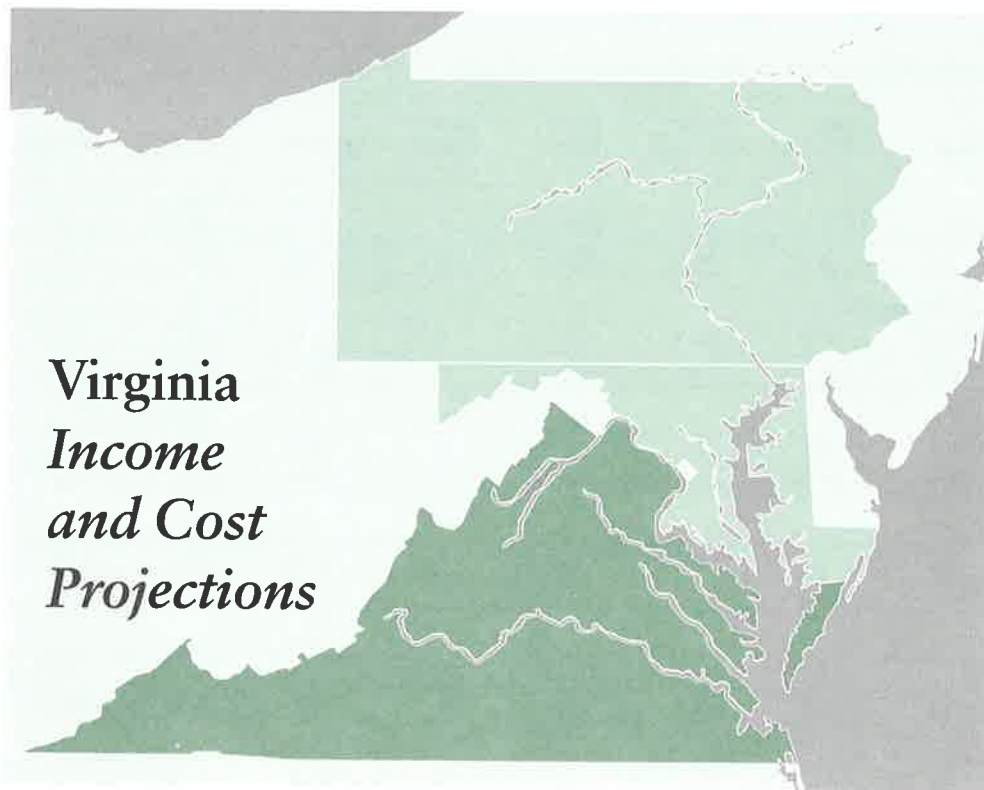
	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>4.1 Land Conservation</b>								
Income 03-10	489	0	52.7	231	0	37.8	167.5	0
Cost 03-10	634.8	0	45.5	388.5	0	37.8	163	0
<b>4.2 Development, Redevelopment and Revitalization</b>								
Income 03-10	395.7	120.5	60.9	0	0	23.8	165.2	25.3
Cost 03-10	690.8	165.2	71.3	0	0	23.8	165.2	265.3
<b>4.3 Transportation</b>								
Income 03-10	29.9	29.5	0	0	0	0.4	0	0
Cost 03-10	29.9	29.5	0	0	0	0.4	0	0
<b>4.4 Public Access</b>								
Income 03-10	2.6	2.1	0	0.1	0	0.4	0	0
Cost 03-10	4.3	2.1	0	0.1	0	0.4	1.7	0
<b>4.0 Total</b>								
Income 03-10	917.2	152.1	113.6	231.1	0	62.4	332.7	25.3
Cost 03-10	1359.8	196.8	116.8	388.6	0	62.4	329.9	265.3

Appendix A

**GOAL 5.0 Stewardship and Community Engagement**

Income and cost projections, by revenue source, for Stewardship and Community Engagement (in millions of dollars)

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>5.1 Education and Outreach</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	54.1	54.1	0	0	0	0	0	0
<b>5.2 Community Engagement</b>								
Income 03-10	13.9	6.2	0	5.6	0	0	0	2.1
Cost 03-10	35.6	14.1	0	15.3	0	0	0	6.2
<b>5.3 Government by Example</b>								
Income 03-10	3	3	0	0	0	0	0	0
Cost 03-10	3	3	0	0	0	0	0	0
<b>5.4 Partnerships</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	0	0	0	0	0	0	0	0
<b>5.0 Total</b>								
Income 03-10	16.9	9.2	0	5.6	0	0	0	2.1
Cost 03-10	92.7	71.2	0	15.3	0	0	0	6.2



## Virginia Income and Cost Projections

### GOAL 1.0 Living Resource Protection and Restoration

Income and cost projections, by revenue source, for Living Resource Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>1.1 Oysters</b>								
Income 03-10	26.4	5.6	0.8	0	0	19.2	0.8	0
Cost 03-10	40	19.2	0.8	0	0	19.2	0.8	0
<b>1.2 Exotic Species</b>								
Income 03-10	0	0	0	0	0	0	0	0
Cost 03-10	4.8	4.8	0	0	0	0	0	0
<b>1.3 Fish Passage &amp; Migratory &amp; Resident Fish</b>								
Income 03-10	20.5	0	4.2	0	0	16.3	0	0
Cost 03-10	32.6	0	9.5	0.6	0	22.5	0	0
<b>1.4 Multi-species Management</b>								
Income 03-10	5.8	0.2	0.9	0.6	0	4.1	0	0
Cost 03-10	10.1	2.1	3.3	0.6	0	4.1	0	0
<b>1.5 Crabs</b>								
Income 03-10	2.3	1.4	0.6	0	0	0.3	0	0
Cost 03-10	7.9	3.7	2.4	0	0	1.8	0	0
<b>1.0 Total</b>								
Income 03-10	55	7.2	6.5	0.6	0	39.9	0.8	0
Cost 03-10	95.4	29.8	16	1.2	0	47.6	0.8	0

## GOAL 2.0 Vital Habitat Protection and Restoration

Income and cost projections, by revenue source, for Vital Habitat Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>2.1 Submerged Aquatic Vegetation</b>								
Income 03-10	5	1.3	1.7	0	0	2	0	0
Cost 03-10	10.7	2.8	3.6	0	0	4.3	0	0
<b>2.2 Watersheds</b>								
Income 03-10	4.5	4.3	0.1	0	0	0.1	0	0
Cost 03-10	80.3	80.3	0	0	0	0	0	0
<b>2.3 Wetlands</b>								
Income 03-10	21.3	11.5	0	0	0	9.8	0	0
Cost 03-10	49.4	36.7	0	0	0	12.7	0	0
<b>2.4 Forests</b>								
Income 03-10	0.2	0	0	0	0	0.2	0	0
Cost 03-10	6.2	6.2	0	0	0	0	0	0
<b>2.0 Total</b>								
Income 03-10	31	17.1	1.8	0	0	12.1	0	0
Cost 03-10	146.6	126	3.6	0	0	17	0	0

Appendix A

## GOAL 3.0 Water Quality Protection and Restoration

Income and cost projections, by revenue source, for Water Quality Protection and Restoration (in millions of dollars).

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>3.1 Nutrients and Sediments</b>								
Income 03-10	115.3	70.8	25.7	0	0	18.8	0	0
Cost 03-10	4355.5	417.5	25.7	0	50.9	401.9	2988.8	470.7
<b>3.2 Chemical Contaminants</b>								
Income 03-10	38.4	19.9	7.5	0	0	11	0	0
Cost 03-10	46.3	27.8	7.5	0	0	11	0	0
<b>3.3 Priority Urban Waters</b>								
Income 03-10	8.3	0	0	0	0	8.3	0	0
Cost 03-10	14.6	5	0	0	0	8.3	1.3	0
<b>3.4 Air Pollution</b>								
Income 03-10	80.6	18.7	49.7	0	0	12.2	0	0
Cost 03-10	80.6	18.7	49.7	0	0	12.2	0	0
<b>3.5 Boat Discharge</b>								
Income 03-10	*	*	*	*	*	*	*	*
Cost 03-10	*	*	*	*	*	*	*	*
<b>3.0 Total</b>								
Income 03-10	242.6	109.4	82.9	0	0	50.3	0	0
Cost 03-10	4497	469	82.9	0	50.9	433.4	2990.1	470.7

\*No estimates provided.

**GOAL 4.0 Sound Land Use**

Income and cost projections, by revenue source, for Sound Land Use (in millions of dollars)

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>4.1 Land Conservation</b>								
Income 03-10	48.6	17.6	0.9	5.5	15	9.6	0	0
Cost 03-10	596.6	17.6	0.9	553.5	15	9.6	0	0
<b>4.2 Development, Redevelopment and Revitalization</b>								
Income 03-10	168.1	19	131.2	0	0	17.9	0	0
Cost 03-10	230.9	81.8	131.2	0	0	17.9	0	0
<b>4.3 Transportation</b>								
Income 03-10	428.7	0	428.7	0	0	0	0	0
Cost 03-10	428.7	0	428.7	0	0	0	0	0
<b>4.4 Public Access</b>								
Income 03-10	15.6	0	3.6	0	0	8	4	0
Cost 03-10	37	0	10	0	5	16.5	5.5	0
<b>4.0 Total</b>								
Income 03-10	661	36.6	564.4	5.5	15	35.5	4	0
Cost 03-10	1293.2	99.4	570.8	553.5	20	44	5.5	0

Appendix A

**GOAL 5.0 Stewardship and Community Engagement**

Income and cost projections, by revenue source, for Stewardship and Community Engagement (in millions of dollars)

	Total	State/ Gen. Fund	State/ Spec. Fund	State/ Other	State/ Capital	Federal	Local	Non-Gov.
<b>5.1 Education and Outreach</b>								
Income 03-10	4.7	3.4	0.3	0	0	1	0	0
Cost 03-10	45.1	43.8	0.3	0	0	1	0	0
<b>5.2 Community Engagement</b>								
Income 03-10	5.6	4.6	0	0	0	1	0	0
Cost 03-10	64.1	64.1	0	0	0	0	0	0
<b>5.3 Government by Example</b>								
Income 03-10	*	*	*	*	*	*	*	*
Cost 03-10	*	*	*	*	*	*	*	*
<b>5.4 Partnerships</b>								
Income 03-10	*	*	*	*	*	*	*	*
Cost 03-10	*	*	*	*	*	*	*	*
<b>5.0 Total</b>								
Income 03-10	10.3	8	0.3	0	0	2	0	0
Cost 03-10	109.2	107.9	0.3	0	0	1	0	0

\*No estimates provided.

# Chesapeake 2000 Commitments

## APPENDIX B

*Appendix B*

### **1.0 LIVING RESOURCE PROTECTION AND RESTORATION**

#### **1.1 Oysters**

- 1.1.1.1 By 2010, achieve, at a minimum, a tenfold increase in native oysters in the Chesapeake Bay, based upon a 1994 baseline.
- 1.1.1.2 By 2002, develop and implement a strategy to achieve this increase by using sanctuaries sufficient in size and distribution, aquaculture, continued disease research and disease-resistant management strategies, and other management approaches.

#### **1.2 Exotic Species**

- 1.2.1 In 2000, establish a Chesapeake Bay Program Task Force to:
  - 1.2.1.1 Work cooperatively with the U.S. Coast Guard, the ports, the shipping industry, environmental interests and others at the national level to help establish and implement a national program designed to substantially reduce and, where possible, eliminate the introduction of non-native species carried in ballast water; and
  - 1.2.1.2 By 2002, develop and implement an interim voluntary ballast water management program for the waters of the Bay and its tributaries.
- 1.2.2.1 By 2001, identify and rank non-native, invasive aquatic and terrestrial species, which are causing or have the potential to cause significant negative impacts to the Bay's aquatic ecosystem.
- 1.2.2.2 By 2003, develop and implement management plans for those species deemed problematic to the restoration and integrity of the Bay's ecosystem.

#### **1.3 Fish Passage and Migratory and Resident Fish**

- 1.3.1 By June 2002, identify the final initiatives necessary to achieve our existing goal of restoring fish passage for migratory fish to more than 1,357 miles of currently blocked river habitat by 2003 and establish a monitoring program to assess outcomes.
- 1.3.2 By 2002, set a new goal with implementation schedules for additional migratory and resident fish passages that addresses the removal of physical blockages. In addition, the goal will address the removal of chemical blockages caused by acid mine drainage. Projects should be selected for maximum habitat and stock benefit.
- 1.3.3 By 2002, assess trends in populations for priority migratory fish species. Determine tributary-specific target population sizes based upon projected fish passage, and current and projected habitat available,



and provide recommendations to achieve those targets.

- 1.3.4 By 2003, revise fish management plans to include strategies to achieve target population sizes of tributary-specific migratory fish.

#### 1.4 Multi-species Management

- 1.4.1 By 2004, assess the effects of different population levels of filter feeders such as menhaden, oysters and clams on Bay water quality and habitat.
- 1.4.2 By 2005, develop ecosystem-based multi-species management plans for targeted species.
- 1.4.3 By 2007, revise and implement existing fisheries management plans to incorporate ecological, social and economic considerations, multi-species fisheries management and ecosystem approaches.

#### 1.5 Crabs

- 1.5.1 By 2001, establish harvest targets for the blue crab fishery and begin implementing complementary state fisheries management strategies Baywide. Manage the blue crab fishery to restore a healthy spawning biomass, size and age structure.

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## 2.0 VITAL HABITAT PROTECTION AND RESTORATION

### 2.1 Submerged Aquatic Vegetation

- 2.1.1 Recommit to the existing goal of protecting and restoring 114,000 acres of submerged aquatic vegetation (SAV).
- 2.1.2 By 2002, revise SAV restoration goals and strategies to reflect historic abundance, measured as acreage and density from the 1930s to the present. The revised goals will include specific levels of water clarity that are to be met in 2010. Strategies to achieve these goals will address water clarity, water quality.
- 2.1.3 By 2002, implement a strategy to accelerate protection and restoration of SAV beds in areas of critical importance to the Bay's living resources.

### 2.2 Watersheds

- 2.2.1 By 2010, work with local governments, community groups and watershed organizations to develop and implement locally supported watershed management plans in two-thirds of the Bay watershed covered by this Agreement. These plans would address the protection, conservation and restoration of stream

corridors, riparian forest buffers and wetlands for the purposes of improving habitat and water quality, with collateral benefits for optimizing stream flow and water supply.

- 2.2.2 By 2001, each jurisdiction will develop guidelines to ensure the aquatic health of stream corridors. Guidelines should consider optimal surface and ground-water flows.
- 2.2.3 By 2002, each jurisdiction will work with local governments and communities that have watershed management plans to select pilot projects that promote stream corridor protection and restoration.
- 2.2.4 By 2003, include in the "State of the Bay Report," and make available to the public, local governments and others, information concerning the aquatic health of stream corridors based on adopted regional guidelines.
- 2.2.5 By 2004, each jurisdiction, working with local governments, community groups and watershed organizations, will develop stream corridor restoration goals based on local watershed management planning.

### 2.3 Wetlands

- 2.3.1 Achieve a no-net loss of existing wetlands acreage and function in the signatories' regulatory programs.
- 2.3.2.1 By 2010, achieve a net resource gain by restoring 25,000 acres of tidal and non-tidal wetlands.
- 2.3.2.2 To do this, we commit to achieve and maintain an average restoration rate of 2,500 acres per year basin wide by 2005 and beyond. We will evaluate our success in 2005.
- 2.3.3.1 Provide information and assistance to local governments and community groups for the development and implementation of wetlands preservation plans as a component of a locally based integrated watershed management plan.
- 2.3.3.2 Establish a goal of implementing the wetlands plan component in 25 percent of the land area of each state's Bay watershed by 2010. The plans would preserve key wetlands while addressing surrounding land use so as to preserve wetland functions.
- 2.3.4 Evaluate the potential impact of climate change on the Chesapeake Bay watershed, particularly with respect to its wetlands, and consider potential management options.

### 2.4 Forests

- 2.4.1.1 By 2002, ensure that measures are in place to meet our riparian forest buffer restoration goal of 2,010 miles by 2010.

- 2.4.1.2 By 2003, establish a new goal to expand buffer mileage.
- 2.4.2 Conserve existing forests along all streams and shorelines.
- 2.4.3 Promote the expansion and connection of contiguous forests through conservation easements, greenways, purchase and other land conservation mechanisms.

**3.0 WATER QUALITY PROTECTION AND RESTORATION**

**3.1 Nutrients and Sediments**

- 3.1.1 Continue efforts to achieve and maintain the 40 percent nutrient reduction goal agreed to in 1987, as well as the goals being adopted for the tributaries south of the Potomac River.
- 3.1.2 By 2010, correct the nutrient- and sediment-related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove the Bay and the tidal portions of its tributaries from the list of impaired waters under the Clean Water Act. In order to achieve this:
  - 3.1.2.1 By 2001, define the water quality conditions necessary to protect aquatic living resources and then assign load reductions for nitrogen and phosphorus to each major tributary;
  - 3.1.2.2 Using a process parallel to that established for nutrients, determine the sediment load reductions necessary to achieve the water quality conditions that protect aquatic living resources, and assign load reductions for sediment to each major tributary by 2001;
  - 3.1.2.3 By 2002, complete a public process to develop and begin implementation of revised Tributary Strategies to achieve and maintain the assigned loading goals;
  - 3.1.2.4 By 2003, the jurisdictions with tidal waters will use their best efforts to adopt new or revised water quality standards consistent with the defined water quality conditions. Once adopted by the jurisdictions, the Environmental Protection Agency will work expeditiously to review the new or revised standards, which will then be used as the basis for removing the Bay and its tidal rivers from the list of impaired waters; and
  - 3.1.2.5 By 2003, work with the Susquehanna River Basin Commission and others to adopt and begin implementing strategies that prevent the loss of the sediment retention capabilities of the lower Susquehanna River dams.

**3.2 Chemical Contaminants**

- 3.2.1 We commit to fulfilling the 1994 goal of a Chesapeake Bay free of toxics by reducing or eliminating the input of chemical contaminants from all controllable sources to levels that result in no toxic or bioaccumulative impact on the living resources that inhabit the Bay or on human health.
- 3.2.2 By Fall of 2000, reevaluate and revise, as necessary, the “Chesapeake Bay Basinwide Toxics Reduction and Prevention Strategy” focusing on:
  - 3.2.2.1 Complementing state and federal regulatory programs to go beyond traditional point source controls, including nonpoint sources such as groundwater discharge and atmospheric deposition, by using a watershed-based approach; and
  - 3.2.2.2 Understanding the effects and impacts of chemical contaminants to increase the effectiveness of management actions.
  - 3.2.3.1 Through continual improvement of pollution prevention measures and other voluntary means, strive for zero release of chemical contaminants from point sources, including air sources.
  - 3.2.3.2 Particular emphasis shall be placed on achieving, by 2010, elimination of mixing zones for persistent or bio-accumulative toxics.
- 3.2.4 Reduce the potential risk of pesticides to the Bay by targeting education, outreach and implementation of Integrated Pest Management and specific Best Management Practices on those lands that have higher potential for contributing pesticide loads to the Bay.

**3.3 Priority Urban Waters**

- 3.3.1 Support the restoration of the Anacostia River, Baltimore Harbor, and Elizabeth River and their watersheds as models for urban river restoration in the Bay basin.
- 3.3.2 By 2010, the District of Columbia, working with its watershed partners, will reduce pollution loads to the Anacostia River in order to eliminate public health concerns and achieve the living resource, water quality and habitat goals of this and past Agreements.

**3.4 Air Pollution**

- 3.4.1 By 2003, assess the effects of airborne nitrogen compounds and chemical contaminants on the Bay ecosystem and help establish reduction goals for these contaminants.

*Appendix B*

### 3.5 Boat Discharge

- 3.5.1.1 By 2003, establish appropriate areas within the Chesapeake Bay and its tributaries as “no discharge zones” for human waste from boats.
- 3.5.1.2 By 2010, expand by 50 percent the number and availability of waste pump-out facilities.
- 3.5.2 By 2006, reassess our progress in reducing the impact of boat waste on the Bay and its tributaries. This assessment will include evaluating the benefits of further expanding no discharge zones, as well as increasing the number of pump-out facilities.

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## 4.0 SOUND LAND USE

### 4.1 Land Conservation

- 4.1.1 By 2001, complete an assessment of the Bay’s resource lands including forests and farms, emphasizing their role in the protection of water quality and critical habitats, as well as cultural and economic viability.
- 4.1.2 Provide financial assistance or new revenue sources to expand the use of voluntary and market-based mechanisms such as easements, purchase or transfer of development rights and other approaches to protect and preserve natural resource lands.
  - 4.1.3.1 Strengthen programs for land acquisition and preservation within each state that are supported by funding
  - 4.1.3.2 and target the most valued lands for protection.
  - 4.1.3.3 Permanently preserve from development 20 percent of the land area in the watershed by 2010.
- 4.1.4 Provide technical and financial assistance to local governments to plan for or revise plans, ordinances and subdivision regulations to provide for the conservation and sustainable use of the forest and agricultural lands.
- 4.1.5 In cooperation with local governments, develop and maintain in each jurisdiction a strong GIS system to track the preservation of resource lands and support the implementation of sound land use practices.

### 4.2 Development, Redevelopment and Revitalization

- 4.2.1 By 2012, reduce the rate of harmful sprawl development of forest and agricultural land in the Chesapeake Bay watershed by 30 percent measured as an average over five years from the baseline of 1992-1997, with measures and progress reported regularly to the Chesapeake Executive Council.

- 4.2.2 By 2005, in cooperation with local government, identify and remove state and local impediments to low impact development designs to encourage the use of such approaches and minimize water quality impacts.
- 4.2.3 Work with communities and local governments to encourage sound land use planning and practices that address the impacts of growth, development and transportation on the watershed.
- 4.2.4 By 2002, review tax policies to identify elements, which discourage sustainable development, practices or encourage undesirable growth patterns. Promote the modification of such policies and the creation of tax incentives which promote the conservation of resource lands and encourage investments consistent with sound growth management principles.
- 4.2.5 The jurisdictions will promote redevelopment and remove barriers to investment in underutilized urban, suburban and rural communities by working with localities and development interests.
- 4.2.6 By 2002, develop analytical tools that will allow local governments and communities to conduct watershed-based assessment of the impacts of growth, development and transportation decisions.
- 4.2.7 By 2002, compile information and guidelines to assist local governments and communities to promote ecologically-based designs in order to limit impervious cover in undeveloped and moderately developed watersheds and reduce the impact of impervious cover in highly developed watersheds.
- 4.2.8 Provide information to the development community and others so they may champion the application of sound land use practices.
- 4.2.9 By 2003, work with local governments and communities to develop land-use management and water resource protection approaches that encourage the concentration of new residential development in areas supported by adequate water resources and infrastructure to minimize impacts on water quality.
- 4.2.10 By 2004, the jurisdictions will evaluate local implementation of stormwater, erosion control and other locally-implemented water quality protection programs that affect the Bay system and ensure that these programs are being coordinated and applied effectively in order to minimize the impacts of development.
- 4.2.11 Working with local governments and others, develop and promote wastewater treatment options, such as nutrient reducing septic systems, which protect public health and minimize impacts to the Bay’s resources.

4.2.12 Strengthen brownfield redevelopment. By 2010, rehabilitate and restore 1,050 brownfield sites to productive use.

4.2.13 Working with local governments, encourage the development and implementation of emerging urban storm water retrofit practices to improve their water quantity and quality function.

### 4.3 Transportation

4.3.1 By 2002, the signatory jurisdictions will promote coordination of transportation and land use planning to encourage compact, mixed use development patterns, revitalization in existing communities and transportation strategies that minimize adverse effects on the Bay and its tributaries.

4.3.2 By 2002, each state will coordinate its transportation policies and programs to reduce the dependence on automobiles by incorporating travel alternatives such as telework, pedestrian, bicycle and transit options, as appropriate, in the design of projects so as to increase the availability of alternative modes of travel as measured by increased use of those alternatives.

4.3.3 Consider the provisions of the federal transportation statutes for opportunities to purchase easements to preserve resource lands adjacent to rights of way and special efforts for stormwater management on both new and rehabilitation projects.

4.3.4 Establish policies and incentives, which encourage the use of, clean vehicle and other transportation technologies that reduce emissions.

### 4.4 Public Access

4.4.1 By 2010, expand by 30 percent the system of public access points to the Bay, its tributaries and related resource sites in an environmentally sensitive manner by working with state and federal agencies, local governments and stakeholder organizations.

4.4.2 By 2005, increase the number of designated water trails in the Chesapeake Bay region by 500 miles.

4.4.3 Enhance interpretation materials that promote stewardship at natural, recreational, historical and cultural public access points within the Chesapeake Bay watershed.

4.4.4 By 2003, develop partnerships with at least 30 sites to enhance place-based interpretation of Bay-related resources and themes and stimulate volunteer involvement in resource restoration and conservation.

## 5.0 STEWARDSHIP AND COMMUNITY ENGAGEMENT

### 5.1 Education and Outreach

5.1.1 Make education and outreach a priority in order to achieve public awareness and personal involvement on behalf of the Bay and local watersheds.

5.1.2 Provide information to enhance the ability of citizen and community groups to participate in Bay restoration activities on their property and in their local watershed.

5.1.3.1 Expand the use of new communications technologies to provide a comprehensive and interactive source of information on the Chesapeake Bay and its watershed for use by public and technical audiences.

5.1.3.2 By 2001, develop and maintain a web-based clearinghouse of this information specifically for use by educators.

5.1.4 Beginning with the class of 2005, provide a meaningful Bay or stream outdoor experience for every school student in the watershed before graduation from high school.

5.1.5 Continue to forge partnerships with the Departments of Education and institutions of higher learning in each jurisdiction to integrate information about the Chesapeake Bay and its watershed into school curricula and university programs.

5.1.6 Provide students and teachers alike with opportunities to directly participate in local restoration and protection projects, and to support stewardship efforts in schools and on school property.

5.1.7 By 2002, expand citizen outreach efforts to more specifically include minority populations by, for example, highlighting cultural and historical ties to the Bay, and providing multi-cultural and multi-lingual educational materials on stewardship activities and Bay information.

### 5.2 Community Engagement

5.2.1 Jurisdictions will work with local governments to identify small watersheds where community-based actions are essential to meeting Bay restoration goals in particular wetlands, forested buffers, stream corridors and public access and work with local governments and community organizations to bring an appropriate range of Bay program resources to these communities.

5.2.2 Enhance funding for locally-based programs that pursue restoration and protection projects that will assist in the achievement of the goals of this and past agreements.

*Appendix B*

- 5.2.3 By 2001, develop and maintain a clearinghouse for information on local watershed restoration efforts, including financial and technical assistance.
- 5.2.4 By 2002, each signatory jurisdiction will offer easily accessible information suitable for analyzing environmental conditions at a small watershed scale.
- 5.2.5 Strengthen the Chesapeake Bay Program's ability to incorporate local governments into the policy decision-making process. By 2001, complete a reevaluation of the Local Government Participation Action Plan and make necessary changes in Bay program and jurisdictional functions based upon the reevaluation.
- 5.2.6 Improve methods of communication with and among local governments on Bay issues and provide adequate opportunities for discussion of key issues.
- 5.2.7 By 2001, identify community watershed organizations and partnerships. Assist in establishing new organizations and partnerships where interest exists. These partners will be important to successful watershed management efforts in distributing information to the public, and engaging the public in the Bay restoration and preservation effort.
- 5.2.8 By 2005, identify specific actions to address the challenges of communities where historically poor water quality and environmental conditions have contributed to disproportional health, economic or social impacts.

**5.3 Government by Example**

- 5.3.1 By 2002, each signatory will put in place processes to:
  - 5.3.1.1 Ensure that all properties owned, managed or leased by the signatories are developed, redeveloped and used in a manner consistent with all relevant goals, commitments and guidance of this Agreement.
  - 5.3.1.2 Ensure that the design and construction of signatory-funded development and redevelopment projects are consistent with all relevant goals, commitments and guidance of this Agreement.
- 5.3.2 Expand the use of clean vehicle technologies and fuels on the basis of emission reductions, so that a significantly greater percentage of each signatory government's fleet of vehicles use some form of clean technology.
- 5.3.3 By 2001, develop an Executive Council Directive to address stormwater management to control nutrient, sediment and chemical contaminant runoff from state, federal and District owned land.

**5.4 Partnerships**

- 5.4.1 Strengthen partnerships with Delaware, New York and West Virginia by promoting communication and by seeking agreements on issues of mutual concern.
- 5.4.2 Work with non-signatory Bay states to establish links with community-based organizations throughout the Bay watershed.



## Chesapeake Bay Commission

The Commission maintains offices in Maryland, Virginia and Pennsylvania. Commission staff are available to assist any member of the General Assembly of any signatory state on matters pertaining to the Chesapeake Bay and the Chesapeake Bay Program.

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