ACHIEVING THE CHESAPEAKE BAY NUTRIENT GOALS

A Synthesis of Tributary Strategies for the Bay's Ten Watersheds

Chesapeake Bay Program

October, 1994

This document was prepared by the staff of the Chesapeake Bay Program Office of the U.S. Environmental Protection Agency, with the assistance of representatives from the participating states, the District of Columbia, and the Chesapeake Bay Commission.

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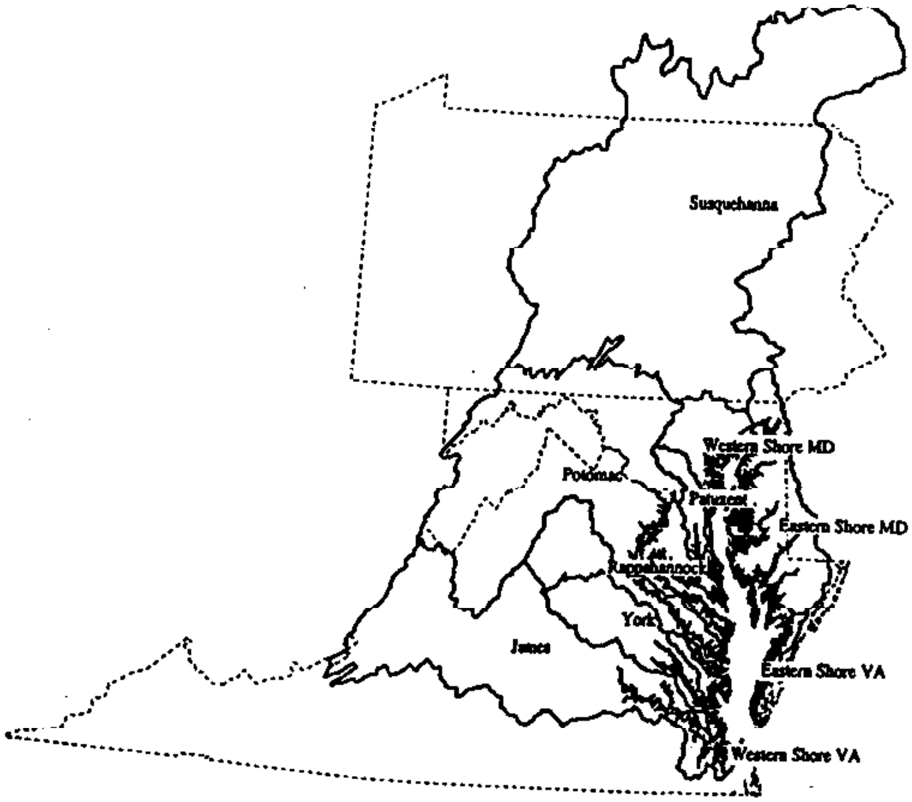

PREFACE

In 1983, the States of Maryland, Pennsylvania, Virginia, the District of Columbia, the Chesapeake Bay Commission, and the US Environmental Protection Agency joined in a partnership to restore the Chesapeake Bay. These jurisdictions realized that the Bay's deterioration and degradation could not be arrested by any one of them acting singly. They acknowledged that the Bay was endangered because of changes in the entire Chesapeake Bay Watershed, a 64,000 square mile area extending from Cooperstown, NY, south to Virginia Beach, VA. In 1987, they agreed to resolve the most pervasive pollution problem by working to effect a 40% reduction in the controllable load of nutrients entering the Bay by the year 2000.

Significant progress has been made toward the nutrient reduction goal, but much remains to be done. Each of the jurisdictions is currently developing *tributary strategies* that delineate the ways in which nutrient pollution loads will be reduced in the many sub-watersheds that feed into the Bay. This coordinated approach brings the Bay clean-up closer to home for the many citizens and local governments whose active participation is essential for the successful restoration, rescue, and rehabilitation of the Chesapeake Bay.

SECTION I

ORIGINS AND OBJECTIVES OF THE TRIBUTARY STRATEGIES

In the late 1970s and early 1980s the newly created Chesapeake Bay Program instituted an intensive research project to determine the causes of the degradation in Chesapeake Bay water quality as well as the fish, shellfish, and other living resources and their habitat. Eutrophication[1], brought on by excessive nutrients entering the Bay, was identified as the primary problem. Consequently, an extensive program to affect significant reductions of nutrients entering the Bay was instituted. Four years after completion of the research phase of the Bay Program, reduction of excess nutrients was further emphasized when the Executive Council[2] signed the 1987 Bay Agreement. This document called for reducing the controllable amount of nutrients reaching the Bay by 40% by the turn of the century.

In 1992, this Bay Agreement nutrient reduction goal was confirmed by the use of computer models, and strengthened by allocating nutrient reduction goals to each of the ten major tributary systems of the Bay, as well as to each jurisdiction. The States of Maryland, Pennsylvania, and Virginia and the District of Columbia agreed to develop tributary specific nutrient reduction strategies in order to achieve the new nutrient loading targets. The loading targets represent a 40% reduction of the portion of the 1985 Base load that is "controllable", defined as the difference between the 1985 Base load and the load from a totally forested (undisturbed) watershed. As a result, the loading target is calculated as the sum of the load from a totally forested watershed plus 60% of the difference between the 1985 Base load and the forested watershed load. The result is a nutrient limit or "cap" for each major tributary of the Chesapeake Bay. The caps also account for anticipated population growth and development between 1985 and 2000.

These reduced nutrient loadings will be achieved through the implementation of the *tributary strategies*. All jurisdictions have completed draft plans and are at different stages in the process of developing the final strategies. These plans document the magnitude of the reduction that is to be achieved; the percentage of the reduction which has been attained since 1985, and finally, options for achieving the remaining reductions. Details of the strategies, as summarized in subsequent sections, examine the mix of nutrient management controls for the different tributaries. The strategies recommend additional controls on wastewater treatment plants, agricultural runoff, and stormwater from urban areas. Existing, modified, or in some cases, new implementation mechanisms will be applied in point source programs, nonpoint source programs, and in associated incentive or

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[1] The condition of the water when an excessive amount of algae is present. This condition is created by an overabundance of nutrients, mainly nitrogen and phosphorus. The deleterious result is anoxia, a depletion of dissolved oxygen.

[2] Comprised of the Governors of Maryland, Pennsylvania, and Virginia; the Mayor of the District of Columbia; the Administrator of the Environmental Protection Agency; and the Chairman of the Chesapeake Bay Commission.

disincentive programs. Citizen involvement in the development, review, refinement, and implementation of the tributary strategies has been a key ingredient.

For the lower Bay tributaries of the Rappahannock, York, James, and the Western and Eastern shores of Virginia interim strategies will be developed by 1995. Studies show these tributaries have less impact on the Bay's nutrient problems, and therefore the key waters at risk are in their own riverine areas. Final nutrient reduction goals will not be established until data gathering and computer modeling of these tributaries provide guidance on the appropriate nutrient reductions and caps required to improve and protect living resources and habitat in each tributary. The final nutrient reduction strategies will be developed in 1997 when monitoring and modeling analysis are completed. Meanwhile, nutrient control actions in these tributaries will continue under the interim 40% reduction strategies.

This report is an overall summary of the tributary strategies. Details on how the strategies were developed, how they were reviewed and refined by citizen involvement, and how the strategies will be specifically implemented are contained in the individual tributary strategies developed by each Bay Program jurisdiction.

Although each strategy is a unique tributary plan, there are a number of findings that can be drawn from their synthesis, as listed below:

The nutrient loadings goals are technically achievable. Earlier studies established that the reduced levels of nitrogen and phosphorous would provide the necessary improvements to restore and protect the water quality and living resources of the Bay. The tributary strategies show that currently available point source and nonpoint source practices and technologies can be used to meet the overall goal. At the same time, they point out some areas where the job will be more costly and difficult than other areas. This means there must be flexibility to employ the most cost-effective solutions.

Implementation of the strategies will require a number of challenges to be met:

- The technology challenge, to keep pressing the effort to find new, better and cheaper ways to get results.
- The fiscal challenge, to obtain the funds necessary to support the actions called for in the strategies.
- The challenge to citizens to engage in the effort to implement the strategies and assure their success.
- The challenge to local governments, to accommodate the underlying land use, development and wastewater issues central to effective implementation of the strategies; and
- The overall political challenge to retain and build public support for restoring the Bay, as the reality of what it will take becomes evident to every community in the watershed through these strategies.

Whether we can meet these challenges will determine if we restore the Bay; we do have the technical means.

For a number of reasons, the tributary strategies indicate that success in meeting reduced nutrient levels will require added attention to point sources. Nutrient sources in the tributaries can be broadly divided into those discharging through pipes, or "Point Sources", and those running off the land and into streams and rivers, or "Nonpoint Sources." The major Point Sources for nutrients are municipal sewage treatment plants. Technology improvements are occurring at a rapid rate in nutrient controls on treatment plants, and costs are dropping. As a result of these advances, nutrient controls are becoming cost-effective at increasing numbers of plants. Also, the results of nitrogen removal are felt immediately in the receiving streams, since there is direct discharge through a pipe.

The role of nonpoint sources in the clean-up is more challenging. Because most management practices to control nutrient loadings from nonpoint sources deal with run-off to streams during storm events, or with loadings to the water table, they are difficult to measure in terms of effectiveness. This problem is exacerbated with respect to groundwater due to the amount and variability of time it takes for the water with reduced nutrients to migrate to surface streams and move on to the Bay. Finally, a number of the strategies call for levels of participation in voluntary programs that challenge the delivery capacities of public sector support programs. For all these reasons, the effectiveness of nonpoint source nutrient reduction efforts in the strategies is more difficult to define and to calculate than is the case with point source elements of the strategies.

Changes in agricultural practices are rapid and will need to be tracked as strategies are implemented. For example, in Pennsylvania, concentrated feed lots are a significant area of growth. As new technologies are tested and adopted by the agricultural community, it will be necessary to make adjustments to projected loadings and to the management measures called for in the strategies. Cropping, silage and planting practices are also subject to rapid changes as the industry continues to seek out the most cost-effective farming operations.

Finally, population growth is a major influence on the level of effort required in the strategies. Bay Program projections of land use changes due to development and growth in loads to sewage treatment plants by the year 2000 will result in additional loadings of 31.2 million pounds of nitrogen to the 74.2 million pounds already needed to be eliminated to meet the year 2000 nutrient cap for the Bay. In other words, for every two pounds of nitrogen removed, one pound returns as a result of population growth and must also be removed. The strategies are designed to accommodate this impact, but its extent underlines the need to emphasize nutrient removal from treatment plants and adequate management of the effects of development on the streams and rivers of the Bay.

SECTION II

COMMON ELEMENTS

The development of Bay Program Tributary Strategies fosters a cooperative, integrated, and consistent scientific approach to nitrogen and phosphorus reduction while providing each of the Bay region states and the District of Columbia the flexibility to deal with the special circumstances of each tributary.

All of the signatory jurisdictions within the Chesapeake Bay region are sharing the responsibility for nutrient reduction. Working together, the CBP jurisdictions first divided the region into major watersheds. Ten such watersheds were identified and an explicit nutrient reduction goal was set for each.

While each jurisdiction developed its own tributary strategies, each strategy addresses specific common elements. The Potomac River basin, due to its multi-state character was treated as a special case, with coordinating roles assigned to the Interstate Commission on the Potomac River Basin (ICPRB) for the basin overall, and the Washington Council of Governments (WASHCOG), for the Washington Metropolitan Area.

The common elements of each tributary strategy include:

- Background: An introduction and overview characterizing the tributary and its nutrient problem.
- Commitment: All strategies are consistent with the overall aim of the 1992 Amendments to the Chesapeake Bay Agreement, including acceptance of the agreed-upon nutrient loading caps and the interim nature of the goals for the lower Virginia tributaries.
- Consistency: Decisions and analysis were made using sound science and the best information on effectiveness of proposed measures available from the Chesapeake Bay Program. Where necessary, ad hoc groups were convened to assure maximum commonality of assumptions.
- Public participation: A broad cross-section of the public was involved in the development, review, and implementation of the strategies.
- Implementation focus: The final strategies will have implementation plans, and will consider the issues of cost-effectiveness, alternative sources of financing, equity, and feasibility.
- Evaluating alternatives: Documents have been prepared to assist the states in applying consistent criteria for evaluating alternatives. A report has been prepared by the ICPRB on the cost and efficacy of nutrient removal technologies in the Chesapeake Bay watershed for both point and nonpoint sources. A study, funded by EPA's Office of Water, is being prepared to evaluate alternative measures to permit limits to achieve necessary reductions from treatment plants in the

Washington Metropolitan Area. This information allows cost comparisons of nutrient reduction scenarios to identify those which are most productive and least costly.

- Ground rules: Although important to the Bay, reductions gained in non-signatory states or through air-pollution controls do not count toward attainment of the nutrient loadings caps. For example, New York's nutrient contributions represent 16 percent of the nitrogen and 10 percent of the phosphorus reaching the Bay by way of the Susquehanna. However, any nutrient reductions gained in New York cannot substitute for Pennsylvania's reduction efforts but are being considered in progress assessments. These issues are addressed later in this report.

- Ongoing water quality efforts: Each of the jurisdictions emphasizes the use of existing point and nonpoint source pollution control efforts to achieve tributary goals. Areas of emphasis being considered include biological nutrient removal or equivalent technology, reservoir management, upgrading wastewater treatment plants, stormwater retrofitting, implementation of Best Management Practices including nutrient management plans, establishment of riparian buffers, and streambank protection.

- Growth: Each of the jurisdictions needs to offset nutrient loads associated with growth and development between 1985 and 2000. As noted above, these added loadings are very significant in some areas of the watershed.

SECTION III

VARIED APPROACHES

There is no single cause of the Bay's environmental problems and no simple solution for them. The geographic, hydrologic, political, and philosophical variations among the jurisdictions result in different approaches to achieve the nutrient reduction goals in an equitable and cost-effective manner. Acting consistent with the common elements discussion in Section II, each jurisdiction crafted a different mix of actions to achieve the nutrient cap on each tributary. The strategies that resulted reflect traditions of local government and private landowner cooperation, or traditions of state relations with the business sector. Alternatives, developed by staff and at public meetings, reinforced the importance of local government, voluntary actions, and private landowner stewardship, which differ from state to state. While most of the land in the watershed is in private hands, the District of Columbia strategy emphasizes working with those Federal agencies which are extensive landowners along the Potomac and the Anacostia.

Maryland and Pennsylvania used different starting points in developing their tributary nutrient reduction strategies. Maryland developed strategies designed to achieve the nutrient reductions goal assuming resources can be found to expand existing abatement and control programs or to develop new programs. Emphasis then shifted to finding the revenue sources to assure funding, through appointment of a Blue Ribbon Panel. The Maryland approach has resulted in strategies which will achieve the goals, given adequate funding, program expansions, and success in achieving a high degree of public acceptance.

Pennsylvania, on the other hand, produced a strategy that it calls "resource constrained." This approach does include several new or expanded efforts and funding, but it includes only programs that the state felt it had a reasonable expectation of being able to fund between now and the year 2000. The Pennsylvania strategies do not achieve completely the nutrient reduction goals of the Pennsylvania portions of the Susquehanna and Potomac Rivers. But suggestions are then made to close the gap with new efforts.

The Virginia approach for the Potomac Basin projects the limits of a comprehensive list of existing point and nonpoint programs. Several ranging scenarios have been developed which all achieve the 40% nutrient reduction target and will be intensively reviewed by the public beginning in October. Resolution of the specific programs which will close the gap will be finalized by next spring.

Each of the jurisdictions involved the public in the development of tributary strategies. But the timing of the public meetings varied in each jurisdiction depending on the process of strategy development. Emphasis was placed on a consensus building process with major "stakeholders" to reach the final recommendations. For example, significant efforts were made to cooperate with the agricultural community and reach consensus on the types of alternatives which would be agreeable and help meet the nutrient goal. Some of the recommendations included steps to encourage public involvement beyond the strategy development phase. For example, Maryland's strategy includes the creation of public-private "Tributary Implementation Teams" to help ensure that the strategies are implemented in a fair and flexible manner.

Pollution loads originate from point and nonpoint sources and each strategy keys actions to these existing conditions. Point source loadings are readily identifiable discharges mainly from municipal sewage treatment plants or industrial facilities through a pipe to surface waters. Nonpoint sources have diffuse origins delivering their pollutant load over a large area; examples include agricultural and urban stormwater runoff. The Pennsylvania strategies rely almost solely on nonpoint source controls on agricultural lands; the Commonwealth is still reviewing point source actions to help it meet the reduction goals. On the other hand the District of Columbia strategy is tied to actions taken at the major regional sewage treatment plant. Maryland and Virginia can use a combination of point and nonpoint source controls to reach the goals.

Pennsylvania's strategy includes cooperative action with New York State as a way to improve the long-term health of the Bay. Included is a proposal for a conference, which is scheduled to be held in late October, to explore further ways in which the two states can cooperate.

Development of the financial plans to implement the tributary strategies is at an early stage. The jurisdictions will rely on a combination of funding sources to pay for nutrient reduction. Existing Chesapeake Bay Programs such as State Implementation Grants and funds available through the states and the Department of Agriculture will be used to help implement nonpoint source recommendations such as nutrient management plans, controls on barnyard runoff, streambank fencing and riparian area protection. Maryland has appointed a "Blue Ribbon Panel" composed of representatives of the full range of interests to identify new and alternative financing options. Pennsylvania has recently obtained critical legislative action to support strategy implementation. The District of Columbia is using Federal funds to help cover the cost of nitrogen removal at the Blue Plains Treatment Plant. Virginia intends to carefully examine a mixture of public and private funding in order to create the financial package needed by the approved program.

Special Case: Potomac River Basin

The Potomac River basin includes all of the jurisdictions working within the Chesapeake Bay Agreement. The Interstate Commission for the Potomac River Basin, a legislatively established government body, has assisted the states to prepare their portions of the Potomac nutrient reduction strategy and will coordinate a strategy for the Potomac basin as a whole. In addition to allowing states to look at the entire watershed, the ICPRB effort will allow jurisdictions to cooperate to more efficiently meet the overall Potomac basin goal.

The jurisdictions with treatment plants in the Washington Metropolitan Area--the District of Columbia, Maryland, and Virginia--have joined with their local governments under the auspices of the Washington Council of Governments to explore the most cost-effective means to reduce nitrogen loading on a regional basis. The potential savings from such an effort--by focusing nitrogen reduction efforts on those plants where removal is most cost effective--are in the order of millions of dollars per year. The Environmental Protection Agency is supporting this effort and has been working with the other parties to reach agreement by mid-1995, on a specific allocation plan, thereby allowing the region to enact the 40% reduction goal without the use of mandatory limits in individual permits and to achieve further savings.

SECTION IV

REMAINING ISSUES

As noted above, the work done to date on the tributary strategies indicates that we have the technical capacity to meet the nutrient reduction goals for the Bay, but that many challenges lie ahead. These include the continuing search for more cost-effective technologies, the need to establish adequate financial sources to carry out the plan, and the on-going public commitment to the clean-up of the Bay.

We are making progress. Bay Program tracking of nutrient reductions shows a reduction of phosphorus by 1992 of 4.1 million pounds, an achievement of 48% of the phosphorus nutrient reduction goal. A major factor in the phosphorus reductions was the phosphate detergent ban, an excellent example of pollution prevention in the Bay basin. Reductions in nitrogen are coming more slowly. By 1992, 6.5 million pounds of nitrogen loads were reduced, achieving 9% of the nitrogen nutrient reduction goal.

And there are other encouraging developments. Recent advances in biological nutrient removal, supported by Bay Program funding, demonstrate that cost-effective technologies for year-round nutrient removal can achieve significant reductions in nitrogen effluent at municipal sewage treatment plants (STPs). For example, at the Annapolis STP, the cost of necessary nitrogen removal was reduced from $24 million to $9.7 million by applying these evolving technologies. Most tributary strategies contain biological nutrient removal as a key element.

The challenge ahead is to achieve similar technical breakthroughs for controlling nutrients, particularly nitrogen, from nonpoint sources. Unlike point sources, where nutrient reductions are relatively immediate and easily quantifiable, there are major challenges in the nonpoint source arena. For example, appearance in the Bay of the benefits of increased efforts to implement agricultural nutrient abatement and control measures may be delayed due to the length of time it takes for the reduced nitrogen loadings to travel through groundwater. A similar condition exists for sediment loads already in streams and rivers from past land use activities which were not sensitive to pollution effects of erosion.

Improved understanding of subsurface load sources is needed. Nitrogen subsurface loads from on-site waste disposal systems (septic systems) are also expected to increase. The loads from on-site waste disposal systems, and factors which control the timing of subsurface nitrogen transport, need to be better understood. Improved understanding of reservoirs as potential nutrient sinks is needed.

Consistency in quantifying removal efficiencies for the different nonpoint source actions challenges the development of realistic load reduction expectations and alternative options to meet the nutrient reduction goal. Perhaps more importantly, reliance on voluntary participation by the agricultural community and the general public in the implementation of nonpoint source abatement and control measures may cause uncertainty in these estimates.

The tributary strategies allow for certain types of trading among nutrient reductions. The Bay Program has learned that trading among point and nonpoint sources, as well as among rivers within a state jurisdiction allows states to achieve the greatest reductions at the lowest cost. Nutrient reduction trading is freely allowed among tributaries within a state in recognition of the fact that nutrient reductions may be easier to achieve in some tributaries than in others. It also permits them to target reductions in such a way as to be of maximum benefit to habitats in the waterways. For example, on a tributary where the 40% reduction can not be achieved, a state may opt to make up for the shortfall by upgrading a wastewater treatment plant on another tributary to exceed the 40% reduction.

A special case is the Susquehanna Basin where a trade between states may be allowed if the 40% reduction goal cannot be achieved in Pennsylvania. In the case of the Susquehanna the draft Pennsylvania plan currently falls short of the goal, but further work is being done by the Commonwealth on point sources and other actions to close the gap. Because it was known from the outset that it would be particularly difficult to reach the reduced levels in the Susquehanna, the 1992 Agreement provided for possible re-allocations to other tributaries.

Our improved understanding of atmospheric nitrogen pollutants is also encouraging. We have learned that about a quarter of the nitrogen load entering the Bay comes from atmospheric sources. About 1/3 of this is deposited on Bay waters; the remainder settles on the land and is washed into the Bay. Air sources of nitrogen originate from the tailpipes of cars and from the smokestacks of power plants and industries. These sources may even be located outside the watershed boundaries. Accordingly, we have learned to add a new word to our lexicon of Bay restoration - the airshed. Though reductions in nitrogen from the air are not calculated in the tributary strategies the Clean Air Act is expected to reduce nitrogen entering the Bay by air deposition. Unfortunately, like point sources, population increases will begin to erode gains made in reducing this source after 2005. Further improvement in understanding atmospheric deposition to the watershed and how to control it is needed.

Finally, the estimated improvements from the tributary strategies do not account for any reductions in nutrient loadings from the non-signatory Bay Basin states of Delaware, New York, and West Virginia. While in each case the rivers of the state draining into the Chesapeake comprise a small fraction of all watersheds, together they comprise a significant portion of the upper reaches of the watershed. It is known that steps are being taken, especially in Delaware and New York, to deal with nutrient pollution in general, and in the Chesapeake tributaries in particular. Additional efforts are needed to understand and capture the benefits of these activities, and to establish working relationships with these other Bay watershed states.

SECTION V

THE NEXT STEPS: IMPLEMENTING THE PLANS AND ACHIEVING THE NUTRIENT CAPS

The tributary strategies are in various stages of development and public review. This report summarizes the content of the current draft strategies in all jurisdictions. Progress on development of the strategies will be reviewed in October, 1994 by the Executive Council. In the fall of 1995, the completed strategies will be presented to the Executive Council for approval.

An administrative challenge will be to develop consistent and reliable methods to assess progress in implementing tributary strategies and determining progress towards the 40% nutrient reduction goal. The Bay Program partners will complete annual tracking of the nutrient load reductions through computer model Progress Scenarios. Coordinated and targeted monitoring efforts will verify model predictions and provide a real world measure of water quality and living resource response to our efforts.

A major review of the goals and progress of the tributary strategies will occur in 1997. For the lower Bay tributaries of the Rappahannock, York, James, and the Western and Eastern shores of Virginia, the connections among nutrient loads, water quality, and living resources will be examined in the computer models now under development. Underwater grasses and bottom organisms will be simulated, providing tributary specific goals for nutrients based on habitat improvements.

Through the 1994-96 period the Bay Program will improve monitoring and modeling of atmospheric loads. These activities will move toward estimates of the controllable atmospheric load delivered to the tidal Bay. Inherent in an improved understanding of atmospheric loads are estimates of the controllable and uncontrollable atmospheric sources, the boundaries of the Chesapeake airshed, and the transformations and losses of deposited atmospheric loads. Estimates of the atmospheric sources of nitrogen are important because although these loads will initially be reduced through implementation of the Clean Air Act, atmospheric loads beyond the year 2005 will increase unless further controls are initiated.

Finally, as progress is made in the Bay Agreement states of Maryland, Pennsylvania, Virginia, and the District of Columbia, more attention will turn to the loadings to river segments of the Chesapeake watershed that lie in Delaware, New York, and West Virginia. These upstream loadings may be subject to controls which are more cost-effective in terms of Bay impact than further actions which might be taken by the signatories. In any case, further dialogue with these non-signatory states should be part of the 1997 review.

Many challenges lie ahead. The Chesapeake Bay Program is about to enter a new phase, which will focus first on tracking nutrient reductions as we move toward the year 2000 goal, and then on maintenance of the nutrient caps. New tools and analyses, now under development, will be needed to track nutrient loads as the Chesapeake Basin moves toward sustainable development. But as we introduce these new elements, we should also remember the mainstays of the Chesapeake Bay Program, which are the sense of community and place we hold in common as citizens of the Chesapeake watershed, and the willingness to make the decisions necessary to protect a national resource.

The following tables and charts delineate the specific nutrient reductions for each tributary and every jurisdiction. The Summary Sheet for the Basin indicates overall achievement of the nutrient reduction goals; however, the following must be kept in mind:

- The Pennsylvania draft strategy was designed to identify the shortfall after all contemplated nonpoint source control actions were taken; the Commonwealth is currently examining point source control options and other "gap-closers" as part of its final strategy. The Chesapeake Bay Basin Summary assumes that these "gap-closers" ultimately take care of one-third of the shortfall: the remainder is handled by reductions in other tributaries in the Basin.

- The Virginia numbers are estimates and are likely to undergo revision as part of the Commonwealth's public review process this winter. Virginia agrees to the reduction goals for the lower tributaries being 40%, on an interim basis, pending the completion of additional modeling and monitoring through 1997. Virginia's draft strategy for the Potomac sets out a series of alternatives to meet the 40% goal.

- Tributary strategies are based upon a jurisdiction's total load allocation. In cases where tributary load estimates for the Year 2000 are above the cap, a jurisdiction may have determined that it was more cost effective to reduce the differential in another tributary.

- Load reductions shown on the "Tributary Strategy (1993-2000)" line do not include progress from 1985 through 1992. It is assumed the "1992 Progress-to-Date (Model)" line accounts for this.

- "Remaining Reduction" line includes an estimate of the increase due to growth from 1993 through 2000. This growth increase is based upon the Year 2000 model projection.

- Your attention is drawn to footnotes attached to a number of the Tables.

NUTRIENT LOADINGS - 1985, 1992, and 2000 (millions of pounds/year)						
BASIN	NITROGEN			PHOSPHORUS		
	1985 Base	1992 Progress	2000 Nutrient Caps	1985 Base	1992 Progress	2000 Nutrient Caps
Susquehanna	116.8	~~117.0~~	98.5	5.95	4.76	3.73
Potomac	~~58.7~~ 70.0	67.8 ~~67.6~~	49.7 ~~50.0~~	5.39 ~~5.32~~	4.56 ~~4.07~~	3.4 ~~3.61~~
Patuxent	4.9	~~3.9~~ OK	3.5	0.53	0.29	0.33
Western Shore, MD	~~29.5~~ 29.4	19.9 ~~20.9~~	16.8 ~~18.9~~	2.0 ~~1.99~~	1.05 ~~1.21~~	1.03 ~~1.22~~
Eastern Shore, MD	~~18.6~~ 18.5	21.5 ~~16.5~~	17.2 ~~14.1~~	1.45 ~~1.44~~	1.49 ~~1.00~~	1.19 ~~0.96~~
Western Shore, VA	4.2	4.2	3.0†	0.50	0.31	0.31†
Eastern Shore, VA	1.8	1.7	1.4†	0.09	0.12	0.06†
Rappahannock	8.3	8.1	5.7†	0.86	0.73	0.54†
York	6.4	6.1	4.5†	0.93	0.62	0.59†
James	43.7	39.7	29.6†	6.18	4.26	4.04†
TOTAL	~~302.9~~	~~285.9~~	~~229.2~~	~~23.79~~	~~17.87~~	~~15.39~~
	304	287.8	229.9	23.88	18.19	15.48

† Interim goals

Chesapeake Bay Basin

Summary Sheet

Strategy Reduction
(millions of pounds)

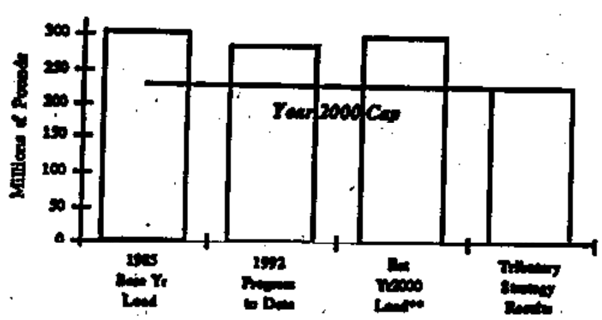
	Nitrogen	Phosphorus
1985 Base Year Load	302.9	23.79
1992 Progress-to-Date (Model)	285.9	17.97
Year 2000 Allocation Load (Cap)	229.2	15.39
Remaining Reduction	70.9	4.00
*Tributary Strategy (1993-2000)	70.9	4.48
Overage (-)/Shortfall (+)	0.0	-0.48

* Assumes Pennsylvania's "cap-closers" are able to achieve 2.7 of 7.9 shortfall in the Susquehanna.

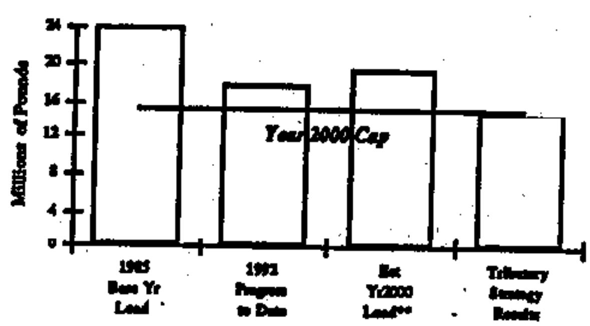
Landuse Statistics
(thousands of acres)

	ac.	%
Cropland	4,389	13
Hayland	2,657	8
Pasture	3,031	9
Forest	20,356	60
Urban	3,348	10
Basin Total	33,780	100%

Chesapeake Bay Basin - Nitrogen



Chesapeake Bay Basin - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

Tributary Strategy Components

Each Component is used in at least one Tributary Strategy.

<u>Nonpoint Source - Agriculture</u>

- Continue existing programs:
  - Conservation planning and application
  - Treatment of highly erodible land (HEL)
  - Streambank protection
- Increase participation in nutrient management planning.
- Winter cover crops on cropland.
- Target the Potomac basin for intensive BMP installation.
- Additional animal waste systems installed.

<u>Nonpoint Source - Forest</u>

- Install riparian forest buffers.
- Reduce forest land conversions.
- Implement timber harvest BMPs.

<u>Point Sources</u>

- Upgrade sewage treatment plants for biological N & chemical P removal.

<u>Nonpoint Source-Urban</u>

- Continue/enhance existing programs:
  - Erosion & Sediment Control
  - Stormwater Management
- Stormwater retrofits in existing urban areas.
- Develop education programs that:
  - Encourage proper septic system maintenance
  - Increase connection of septic systems to sewers
  - Increase urban nutrient management participation

District of Columbia Summary Sheet

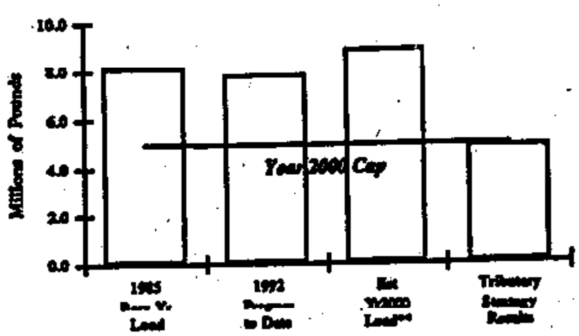
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	8.1	0.12
1992 Progress-to-Date (Model)	7.7	0.07
Year 2000 Allocation Load (Cap)	4.9	0.08
Remaining Reduction	4.0	0.01
Tributary Strategy (1993-2000)	4.0	0.06
Overage (-)/Shortfall (+)	0.0	-0.05

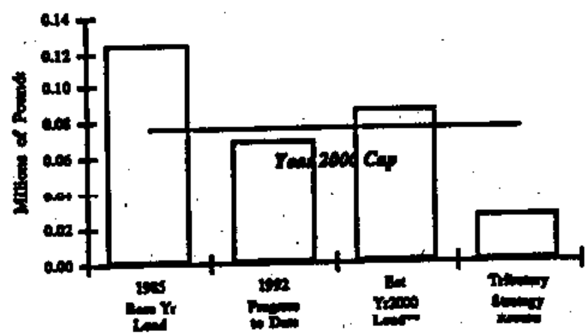
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	0	0
Hayland	0	0
Pasture	0	0
Forest	4	11
Urban	31	89
District Total	35	100%

District of Columbia - Nitrogen



District of Columbia - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

Tributary Strategy Components

Nonpoint Source - Urban

Install Best Management Practices (BMPs) in Rock Creek, Anacostia and Potomac Watersheds.

Point Source

Install BNR at Blue Plains Sewage Treatment Plant
Re-evaluate Phase I of the Sewer Overflow Program.
Implement Phase II of the Sewer Overflow Program.

Maryland Summary Sheet

Strategy Reduction*
(millions of pounds)

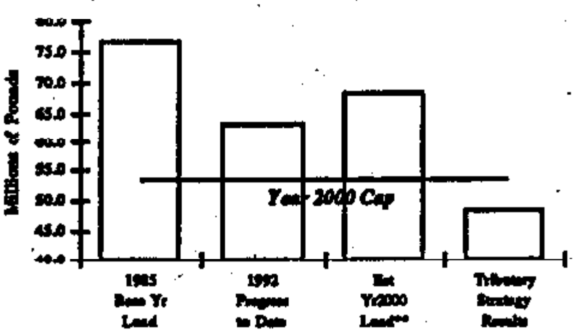
	Nitrogen	Phosphorus
1985 Base Year Load	76.4	5.84
1992 Progress-to-Date (Model)	63.3	3.94
Year 2000 Allocation Load (Cap)	53.6	3.74
Remaining Reduction	14.4	0.47
Tributary Strategy (1993-2000)	19.5	1.14
Overage (-)/Shortfall (+)	-5.1	-0.67

* Based upon adjusted estimates of growth 1985-2000 developed by Maryland.

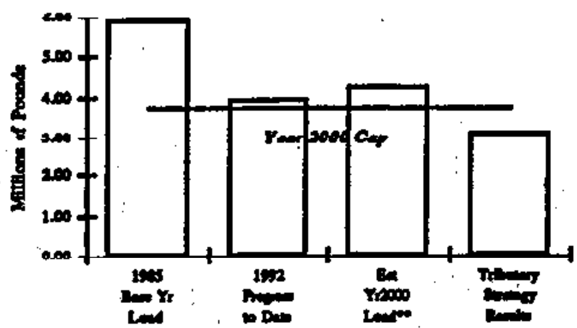
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	1,312	23
Hayland	315	5
Pasture	384	7
Forest	2,623	45
Urban	1,162	20
State Total	5,795	100%

Maryland - Nitrogen



Maryland - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

Tributary Strategy Components

Agriculture
- Implement nutrient management plans.
- Plant winter cover crops.
- Continue existing program.
- Accelerate implementation of SCWQ Plans

Resource Protection and Watershed Planning
- Protect > 800 miles of streams through forest & grass buffers.
- Continue existing programs.
- Protect sensitive areas.
- Fully implement timber harvesting BMPs.
- Install marine pumpouts.
- Enhance and support state, local and private efforts to stabilize and restore streams.

Developed Land
- Erosion & Sediment Control.
- Stormwater Management.
- Develop education programs that:
  - Encourage septic pumping every three years.
  - Increase efforts to connect failing systems to sewers.
  - Increase nutrient management by homeowners.

Point Source
- Upgrade sewage treatment plants > 0.5 MGD. for biological N & chemical P removal.

Pennsylvania Summary Sheet

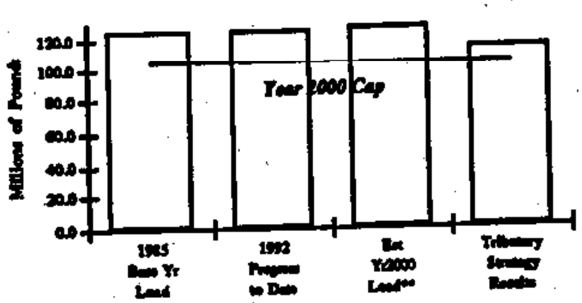
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	124.8	6.75
1992 Progress-to-Date (Model)	124.7	5.50
Year 2000 Allocation Load(Cap)	105.0	4.29
Remaining Reduction	21.3	1.57
Tributary Strategy (1993-2000)	13.4	1.17
Overage (-)/Shortfall (+)	7.9	0.40

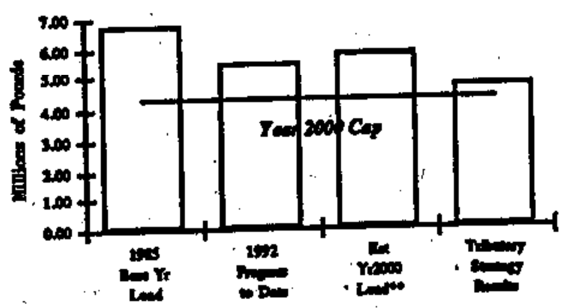
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	1,873	13
Hayland	1,402	10
Pasture	1,070	7
Forest	8,857	62
Urban	1,088	8
State Total	14,289	100%

Pennsylvania - Nitrogen



Pennsylvania - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

Tributary Strategy Components

Nonpoint Source - Agriculture

Implementation of the state nutrient management law.

Continuation/expansion of the streambank fencing program.

Continuation of the existing conservation practice program.

A new barnyard runoff control program.

Gap-Closer - Under Consideration To Deal With Shortfalls

Reevaluating point source controls.

Documenting nutrient reductions from other BMPs installed with and without government assistance.

Research on other sources of nutrients.

Stream Corridor Protection Program.

Expanding enforcement and compliance activities for the erosion and sediment control program.

"Trading" nutrient load reductions between the Susquehanna and Potomac and/or with other Chesapeake Bay signatories.

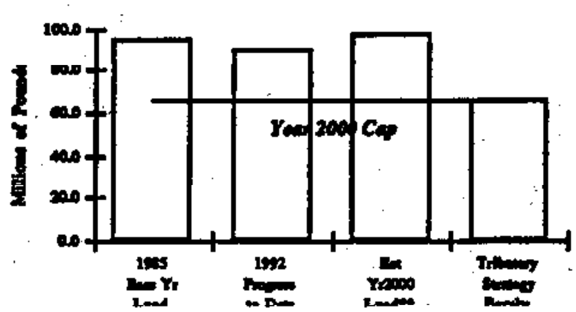
Virginia Summary Sheet

Strategy Reduction (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	94.8	11.16
1992 Progress-to-Date (Model)	90.1	8.36
Year 2000 Allocation Load (Cap)	66.4	7.33
Remaining Reduction	31.3	1.95
*Tributary Strategy (1993-2000)	31.3	2.11
Overage (-)/Shortfall (+)	0.0	-0.16

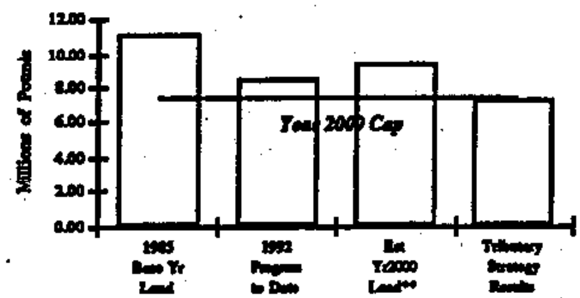
Landuse Statistics (thousands of acres)	ac	%
Cropland	1,205	9
Hayland	941	7
Pasture	1,577	12
Forest	8,872	65
Urban	1,067	8
State Total	13,662	100%

* Final plan for the Virginia portion of the Potomac River Tributary Strategy available in April 1995 following public participation process; a reduction goal of 40% is assumed. Virginia has acknowledged that the reduction goals for the tributaries south of the Potomac River are 40% on an interim basis pending the completion of additional modeling and monitoring through 1997. All Virginia interim nutrient reduction goals include growth and were derived using the CBP Watershed Model.

Virginia - Nitrogen



Virginia - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

Virginia's Tributary Strategy for basins below the Potomac is to continue with current nutrient reduction programs until additional water quality monitoring and modeling allows for the establishment of final tributary nutrient reduction targets. The Tributary Strategy will be finalized after this work is completed. Ongoing programs for the interim, and future possibilities being considered, include:

Tributary Strategy Components

Nonpoint Source - Agriculture
- Continue Existing Programs:
  - Conservation Planning and Application
  - Treatment of HEL
  - Forest Harvest BMP's
- Increase Nutrient Management
- Increase Treatment of CAFO
- Increase Use of Cover Crop
- Installation of Forest and Grass Buffers
- Increased Streambank Protection

Nonpoint Source - Urban
- Continue Existing Programs:
  - Erosion and Sediment Control
  - Stormwater Management
- Increase Stormwater Retrofits
- Expand Urban Nutrient Management
- Increase Septic Connections to Sewer
- Increase Shoreline Protection

Point Source
- Upgrade POTW's to BNR

CBP Tributary Plan - Susquehanna River

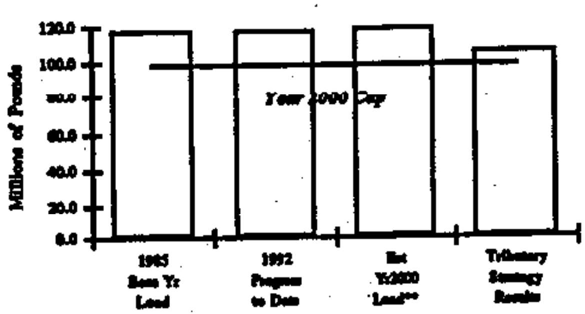
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	116.8	5.95
1992 Progress-to-Date (Model)	117.0	4.76
Year 2000 Allocation Load (Cap)	98.5	3.73
Remaining Reduction	20.2	1.81
Tributary Strategy (1993-2000)	12.5	1.03
Overage (-)/Shortfall (+)	7.7	0.78

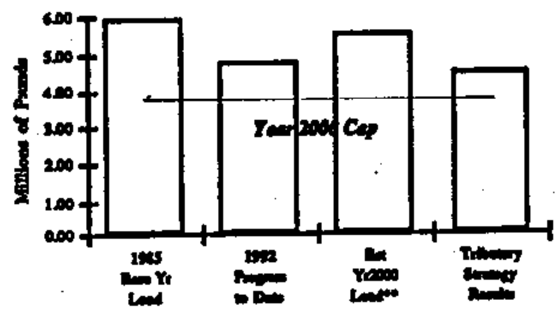
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	1,747	13
Hayland	1,294	10
Pasture	940	7
Forest	8,359	63
Urban	986	7
Total	13,326	100%

Susquehanna River - Nitrogen



Susquehanna River - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Patuxent River

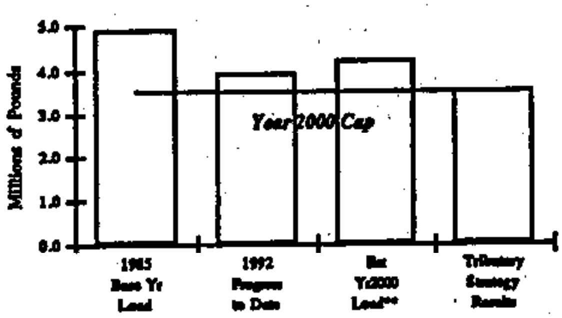
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	4.9	0.53
1992 Progress-to-Date (Model)	3.9	0.29
Year 2000 Allocation Load (Cap)	3.5	0.33
Remaining Reduction	0.7	-0.02
Tributary Strategy (1993-2000)	0.7	0.08
Overage (-)/Shortfall (+)	0.0	-0.10

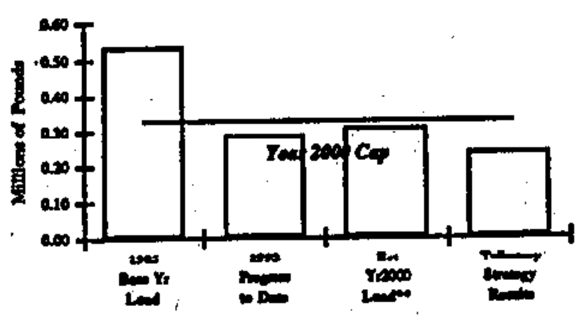
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	64	12
Hayland	20	4
Pasture	26	5
Forest	235	42
Urban	213	38
Total	558	100%

Patuxent River - Nitrogen



Patuxent River - Phosphorus



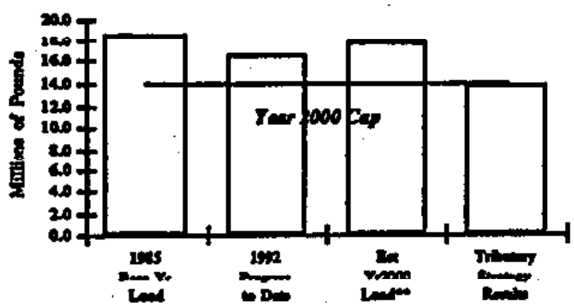
** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Maryland Eastern Shore

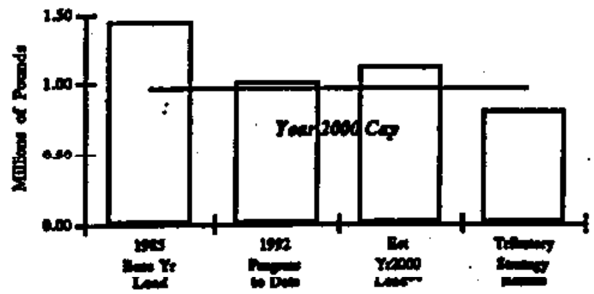
Strategy Reduction (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	18.5	1.45
1992 Progress-to-Date (Model)	16.6	1.00
Year 2000 Allocation Load (Cap)	14.1	0.96
Remaining Reduction	3.6	0.14
Tributary Strategy (1993-2000)	3.9	0.31
Overage (-)/Shortfall (+)	-0.3	-0.17

Landuse Statistics (thousands of acres)	AC	%
Cropland	745	38
Hayland	35	2
Pasture	37	2
Forest	953	48
Urban	201	10
Total	1,971	100%

MD Eastern Shore - Nitrogen



MD Eastern Shore - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

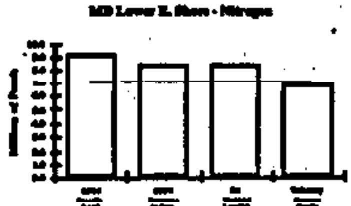
Maryland's Eastern Shore Strategies

MD Lower E. Shore Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	9.2	0.70
1992 Progress-to-Date (Model)	8.5	0.47
Year 2000 Allocation Load (Cap)	7.1	0.47
Remaining Reduction	1.2	0.02
Tributary Strategy (1993-2000)	1.5	0.13
Overage (-)/Shortfall (+)	-0.3	-0.11

MD Upper E. Shore Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	5.6	0.44
1992 Progress-to-Date (Model)	3.0	0.33
Year 2000 Allocation Load (Cap)	4.2	0.29
Remaining Reduction	1.4	0.07
Tributary Strategy (1993-2000)	1.4	0.11
Overage (-)/Shortfall (+)	0.0	-0.04

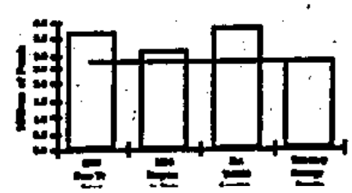
MD Choptank Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	3.7	0.31
1992 Progress-to-Date (Model)	3.1	0.20
Year 2000 Allocation Load (Cap)	2.8	0.20
Remaining Reduction	1.0	0.06
Tributary Strategy (1993-2000)	1.0	0.07
Overage (-)/Shortfall (+)	0.0	-0.03

MD Lower E. Shore - Nitrogen

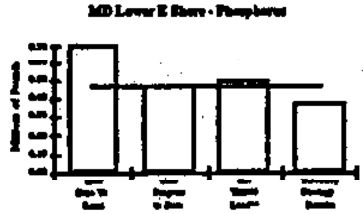


MD Upper E. Shore - Nitrogen

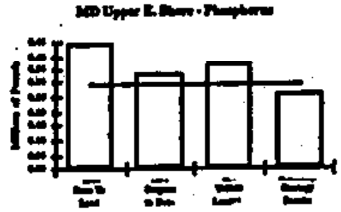
MD Choptank - Nitrogen



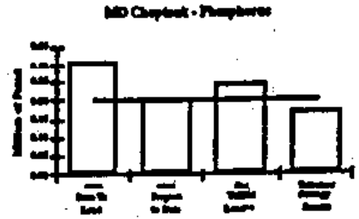
MD Lower E Shore - Phosphorus



MD Upper E. Shore - Phosphorus



MD Choptank - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Maryland Western Shore

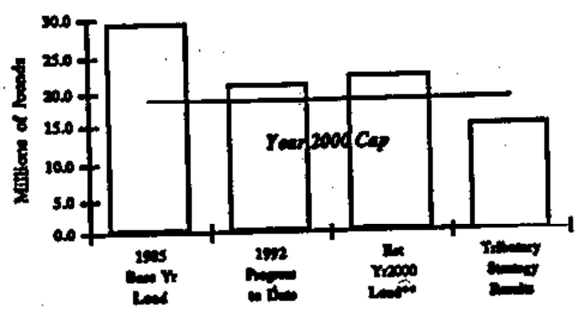
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	29.4	2.00
1992 Progress-to-Date (Model)	20.9	1.21
Year 2000 Allocation Load (Cap)	18.9	1.22
Remaining Reduction	2.9	-0.02
Tributary Strategy (1993-2000)	7.3	0.28
Overage (-)/Shortfall (+)	-4.4	-0.30

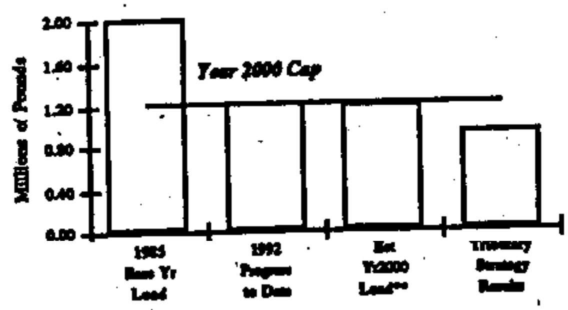
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	181	16
Hayland	65	6
Pasture	91	8
Forest	383	35
Urban	384	35
Total	1,971	100%

MD Western Shore - Nitrogen



MD Western Shore - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

Maryland's Western Shore Strategies

MD Lower W. Shore Strategy
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	1.7	0.26
1992 Progress-to-Date (Model)	1.8	0.15
Year 2000 Allocation Load (Cap)	1.2	0.16
Remaining Reduction	0.6	0.02
Tributary Strategy (1993-2000)	0.5	0.07
Overage (-)/Shortfall (+)	0.1	-0.05

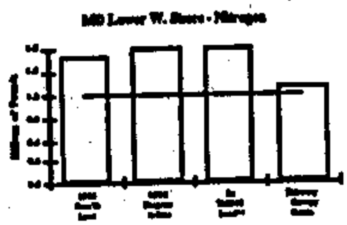
MD Upper W. Shore Strategy
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	5.8	0.50
1992 Progress-to-Date (Model)	5.6	0.39
Year 2000 Allocation Load (Cap)	4.2	0.31
Remaining Reduction	1.5	0.10
Tributary Strategy (1993-2000)	1.8	0.10
Overage (-)/Shortfall (+)	-0.30	0.0

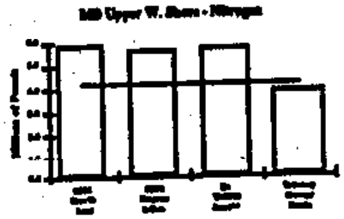
MD Patapsco/Back Creek Strategy
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	21.9	1.26
1992 Progress-to-Date (Model)	13.5	0.67
Year 2000 Allocation Load (Cap)	13.5	0.25
Remaining Reduction	0.0	-0.14
Tributary Strategy (1993-2000)	4.3	0.12
Overage (-)/Shortfall (+)	-4.3	-0.25

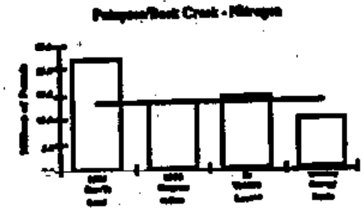
MD Lower W. Shore - Nitrogen



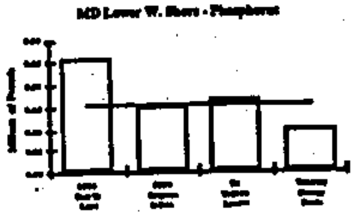
MD Upper W. Shore - Nitrogen



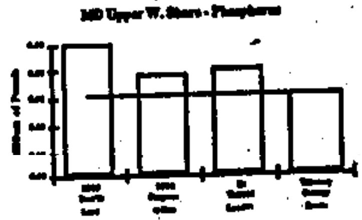
Patapsco/Back Creek - Nitrogen



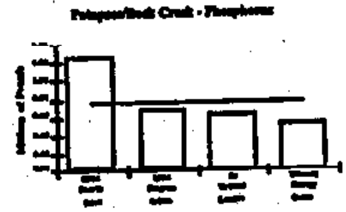
MD Lower W. Shore - Phosphorus



MD Upper W. Shore - Phosphorus



Patapsco/Back Creek - Phosphorus



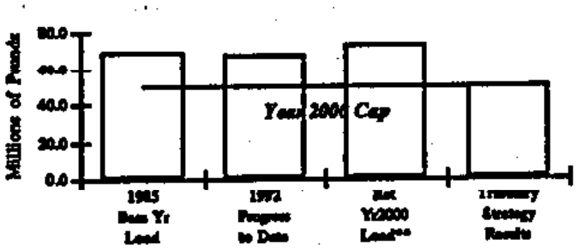
** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Potomac

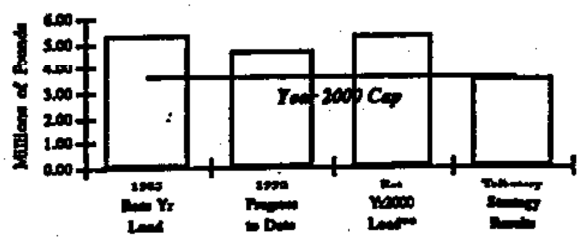
Strategy Reduction (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	68.7	5.32
1992 Progress-to-Date (Model)	67.7	4.67
Year 2000 Allocation Load (Cap)	50.0	3.61
Remaining Reduction	22.8	1.68
Tributary Strategy (1993-2000)	23.6	1.84
Overage (-)/Shortfall (+)	-0.8	-0.16

Landuse Statistics (thousands of acres)	AC	%
Cropland	774	12
Hayland	643	10
Pasture	949	14
Forest	3,410	51
Urban	218	14
Total	6,694	100%

Potomac River - Nitrogen



Potomac River - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

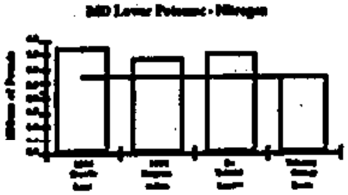
Maryland's Potomac Strategies

MD Lower Potomac Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	3.7	0.30
1992 Progress-to-Date (Model)	3.5	0.22
Year 2000 Allocation Load (Cap)	2.7	0.19
Remaining Reduction	0.8	0.02
Tributary Strategy (1993-2000)	0.8	0.06
Overage (-)/Shortfall (+)	0.0	-0.04

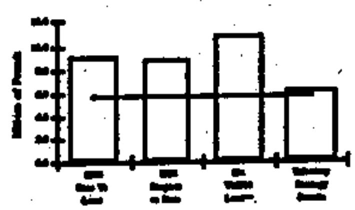
MD Middle Potomac Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	9.1	0.31
1992 Progress-to-Date (Model)	9.0	0.24
Year 2000 Allocation Load (Cap)	5.9	0.21
Remaining Reduction	[illegible]	[illegible]
Tributary Strategy (1993-2000)	4.6	0.12
Overage (-)/Shortfall (+)	0.2	0.01

MD Upper Potomac Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	10.7	1.26
1992 Progress-to-Date (Model)	9.7	0.98
Year 2000 Allocation Load (Cap)	8.5	0.85
Remaining Reduction	1.4	0.22
Tributary Strategy (1993-2000)	2.1	0.30
Overage (-)/Shortfall (+)	-0.6	-0.08

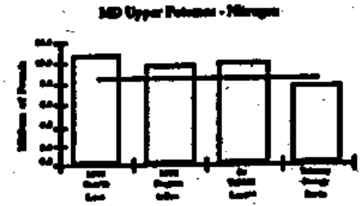
MD Lower Potomac - Nitrogen



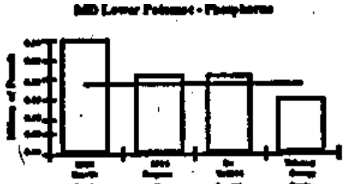
MD Middle Potomac - Nitrogen



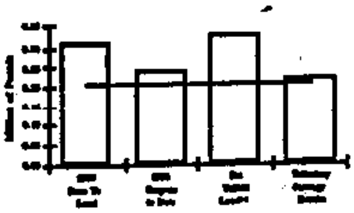
MD Upper Potomac - Nitrogen



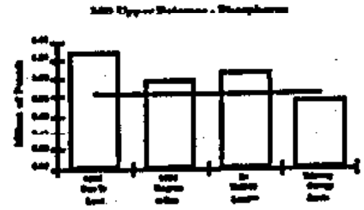
MD Lower Potomac - Phosphorus



MD Middle Potomac - Phosphorus



MD Upper Potomac - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

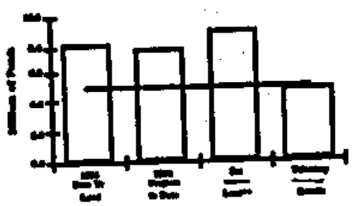
Virginia/Pennsylvania/District of Columbia Potomac Strategies

DC Potomac Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	8.1	0.12
1992 Progress-to-Date (Model)	7.7	0.07
Year 2000 Allocation Load (Cap)	4.9	0.06
Remaining Reduction	4.0	0.01
Tributary Strategy (1993-2000)	4.6	0.06
Overage (-)/Shortfall (+)	0.0	-0.05

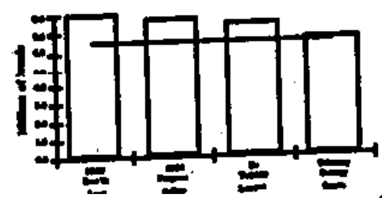
PA Potomac Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	8.8	0.80
1992 Progress-to-Date (Model)	7.7	0.74
Year 2000 Allocation Load (Cap)	6.5	0.56
Remaining Reduction	1.1	0.24
Tributary Strategy (1993-2000)	0.9	0.14
Overage (-)/Shortfall (+)	0.2	0.10

VA Potomac Strategy (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	27.8	2.44
1992 Progress-to-Date (Model)	30.4	2.43
Year 2000 Allocation Load (Cap)	21.5	1.68
Remaining Reduction	10.5	0.71
Tributary Strategy (1993-2000)	10.5	0.71
Overage (-)/Shortfall (+)	0.0	0.00

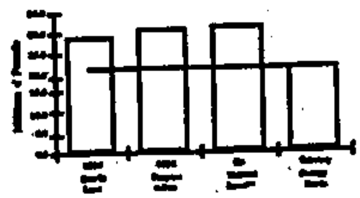
District of Columbia - Nitrogen



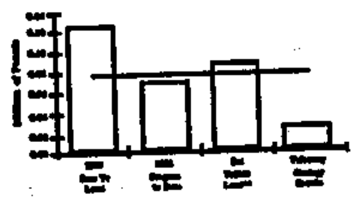
PA Potomac - Nitrogen



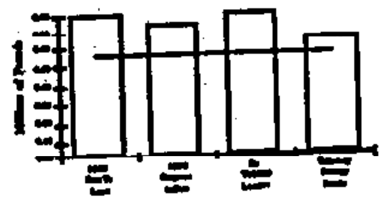
VA Potomac - Nitrogen



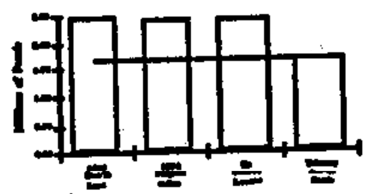
District of Columbia - Phosphorus



PA Potomac - Phosphorus



VA Potomac - Phosphorus



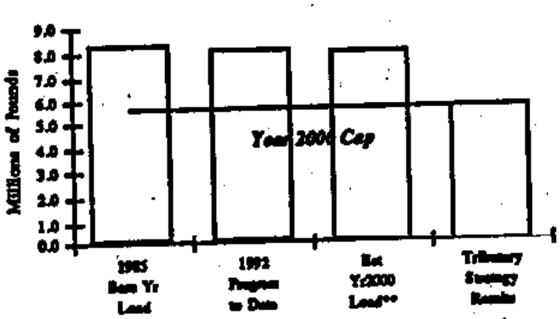
** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Rappahannock River

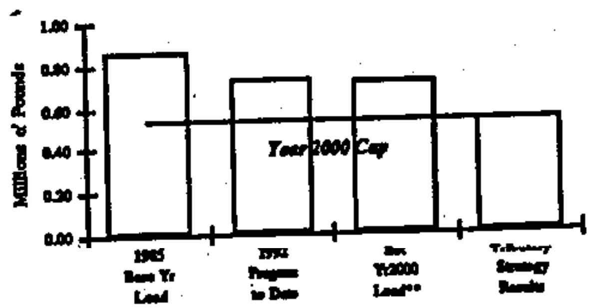
Strategy Reduction (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	8.3	0.86
1992 Progress-to-Date (Model)	8.1	0.73
Year 2000 Allocation Load (Cap)	5.7	0.54
Remaining Reduction	2.3	0.18
Tributary Strategy (1993-2000)	2.3	0.18
Overage (-)/Shortfall (+)	0.0	0.00

Landuse Statistics (thousands of acres)	ac	%
Cropland	191	12
Hayland	129	8
Pasture	241	15
Forest	1,000	61
Urban	71	4
Total	1,632	100%

Rappahannock River - Nitrogen



Rappahannock River - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - York River

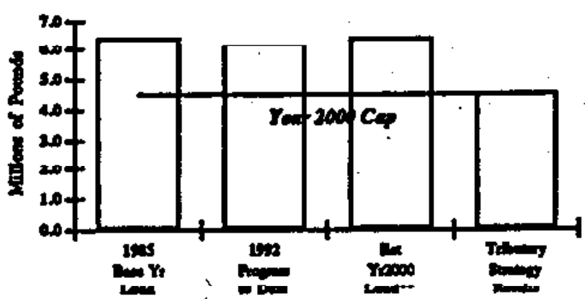
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	6.4	0.93
1992 Progress-to-Date (Model)	6.1	0.62
Year 2000 Allocation Load (Cap)	4.5	0.59
Remaining Reduction	1.9	0.13
Tributary Strategy (1993-2000)	1.9	0.21
Overage (-)/Shortfall (+)	0.0	-0.08

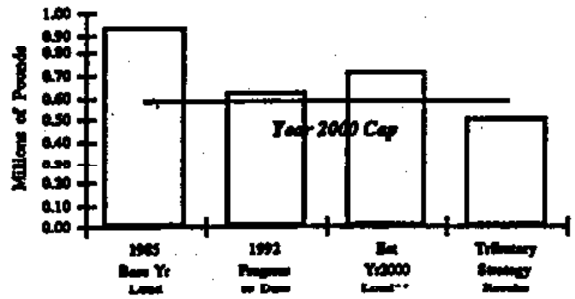
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	185	11
Hayland	63	4
Pasture	69	4
Forest	1,184	73
Urban	129	8
Total	1,630	100%

York River - Nitrogen



York River - Phosphorus



** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - James River

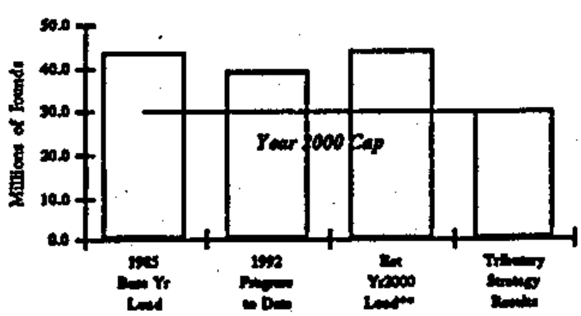
Strategy Reduction
(millions of pounds)

	Nitrogen	Phosphorus
1985 Base Year Load	43.7	6.18
1992 Progress-to-Date (Model)	39.7	4.26
Year 2000 Allocation Load (Cap)	29.6	4.04
Remaining Reduction	14.8	0.92
Tributary Strategy (1993-2000)	14.8	1.53
Overage (-)/Shortfall (+)	0.0	-0.61

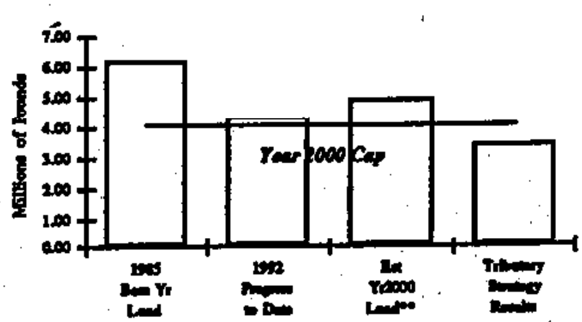
Landuse Statistics
(thousands of acres)

	ac	%
Cropland	355	6
Hayland	405	7
Pasture	666	11
Forest	4,432	71
Urban	360	6
Total	6,218	100%

James River - Nitrogen



James River - Phosphorus

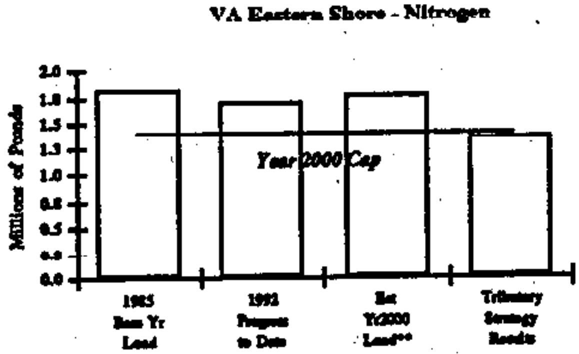


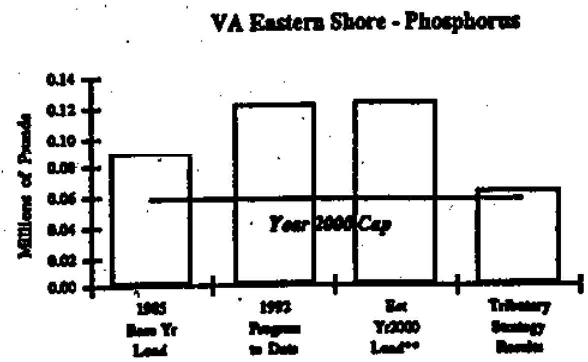
** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Virginia Eastern Shore

Strategy Reduction (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	1.8	0.09
1992 Progress-to-Date (Model)	1.7	0.12
Year 2000 Allocation Load (Cap)	1.4	0.06
Remaining Reduction	0.4	0.06
Tributary Strategy (1993-2000)	0.4	0.06
Overage (-)/Shortfall (+)	0.0	0.00

Landuse Statistics (thousands of acres)	ac	%
Cropland	59	31
Hayland	0	0
Pasture	3	1
Forest	124	64
Urban	6	3
Total	192	100%



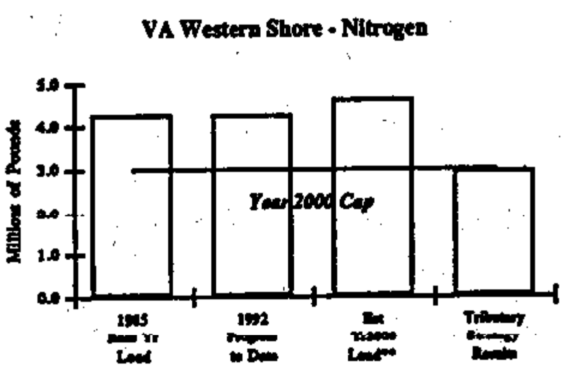


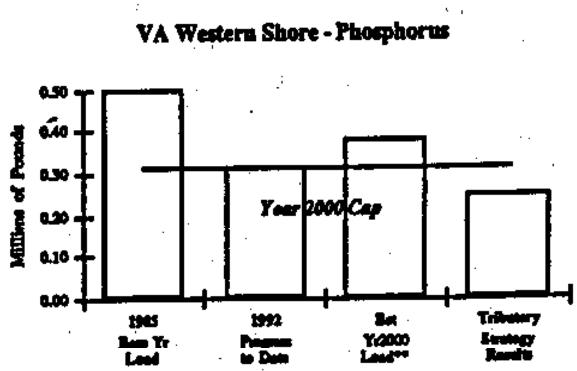
** No further reductions after 1992 and accounts for increased load due to population, growth and development.

CBP Tributary Plan - Virginia Western Shore

Strategy Reduction (millions of pounds)	Nitrogen	Phosphorus
1985 Base Year Load	4.2	0.50
1992 Progress-to-Date (Model)	4.2	0.31
Year 2000 Allocation Load (Cap)	3.0	0.31
Remaining Reduction	1.6	0.07
Tributary Strategy (1993-2000)	1.6	0.13
Overage (-)/Shortfall (+)	0.0	-0.06

Landuse Statistics (thousands of acres)	ac	%
Cropland	87	19
Hayland	2	1
Pasture	9	2
Forest	276	61
Urban	81	18
Total	455	100%





** No further reductions after 1992 and accounts for increased load due to population, growth and development.