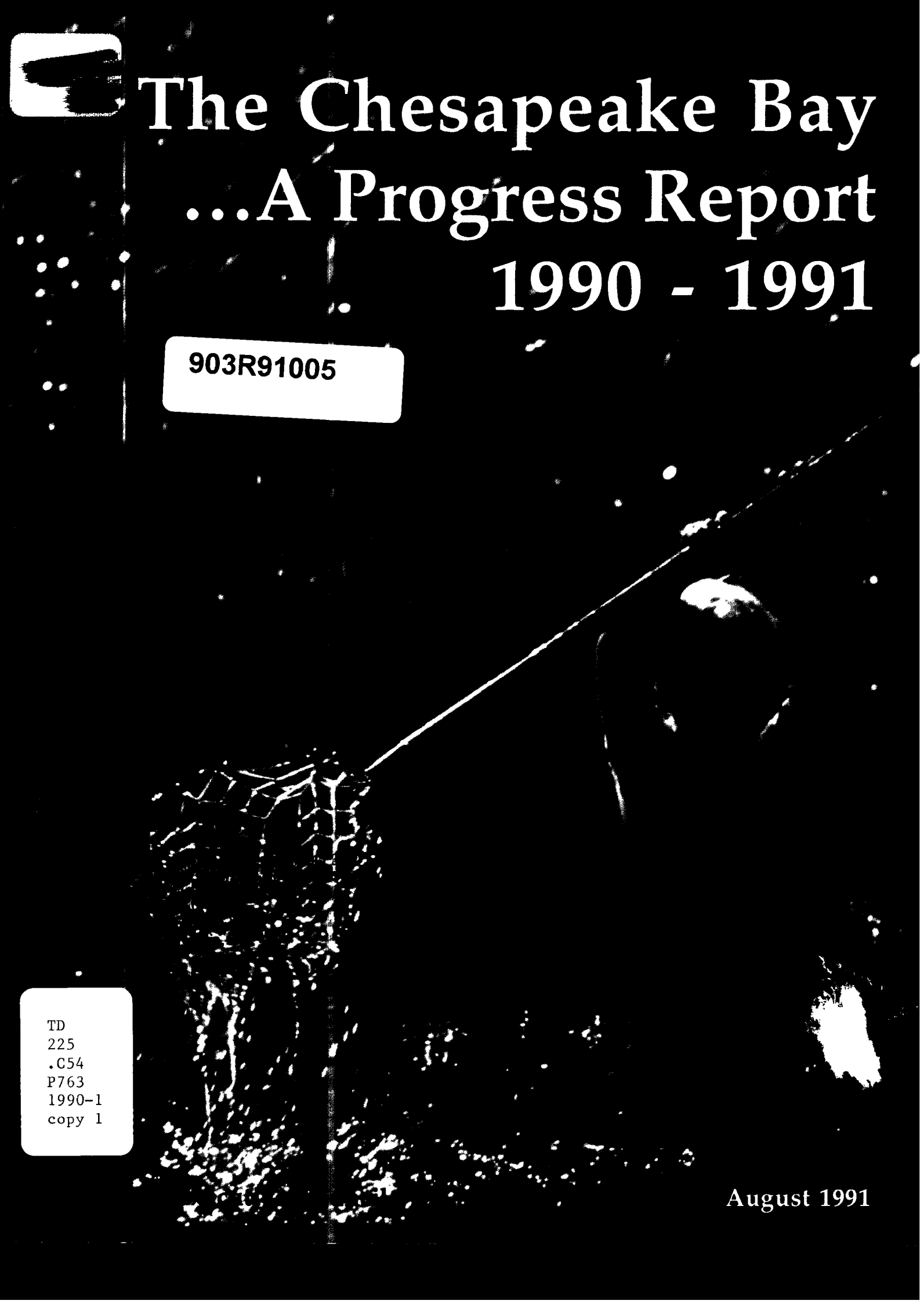
The Chesapeake Bay ...A Progress Report 1990 - 1991

903R91005



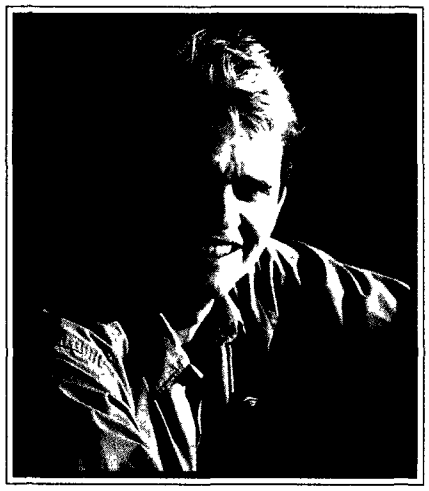
TD
225
.C54
P763
1990-1
copy 1

August 1991

The Chesapeake Bay
A Progress Report
1990 - 1991

U.S. Environmental Protection Agency
Region III Information Resource
Center (3PM52)
841 Chestnut Street
Philadelphia, PA 19107

Prepared for the
Chesapeake Executive Council
by the Chesapeake Bay Program Office
US EPA Region III
410 Severn Avenue, Suite 109
Annapolis, Maryland 21403
(301) 267-0061



William K. Reilly

FOREWORD

To the People of the Chesapeake Bay Region:

The Chesapeake Bay Program has made great progress over the past few years...but even greater tasks still lie ahead. It is time to redouble our efforts, to capitalize on years of pioneering research by moving into a new action phase.

A few indicators of our success suggest how far we have come:

- Phosphorus levels in the Bay have dropped by 20% over the past six years.
- Underwater grasses, vital to many animal species, are starting to return along Bay shorelines.
- Striped bass (or "rockfish") are once again increasing in the Bay - 1990 was the first rockfish season in five years.
- In 1990, we achieved our baywide goal of a 50% reduction in the percentage of municipal and industrial facilities that were in significant non-compliance at the beginning of the year.
- We achieved a 94% compliance rate for federal facilities located in the Bay basin.
- The Department of Defense has committed $50 million and its considerable management talents to improving the compliance of its facilities in the watershed.

All of the above are promising signs and a basis for optimism about the future of the Chesapeake Bay. But they certainly are not cause for declaring victory.

In order to move forward in the 1990s, we must develop more specific program objectives. We must remain vigorous in enforcing pollution control laws. We must focus on preventing pollution before it becomes a problem. We must continue to improve wastewater treatment. We must upgrade livestock management to slow the pollution caused by animal wastes. We also must foster new agricultural practices, especially methods to curb the excess use of chemical fertilizers. We must encourage best management practices that keep toxic chemicals out of the Bay. And finally, we must protect and restore forest buffers and take other steps to protect the shorelines of the Bay and its tributaries.

We all agree that toxic chemicals must be controlled to protect the animal and plant life of the Bay. While phosphorus in the Bay is declining dramatically, there is a slight increase in nitrogen. To help correct this, a growing number of wastewater treatment plants are moving toward nitrogen removal. By some estimates, air pollutants account for 25% of the nitrogen that enters the Bay. The Clean Air Act of 1990 will benefit the Bay by curbing dangerous emissions from cars as well as other air-borne pollution, including nitrogen oxides. Moreover, EPA has launched a voluntary toxics reduction — the 33/50 Program — to reduce emissions of 17 targeted chemicals nationally by 33% by 1992 and 50% by 1995. In the Chesapeake Bay region, we also are asking companies to consider the same reductions for the 14 chemicals on the Bay's Toxics of Concern List, many of which are not on the list of 17 pollutants.

The message is clear: *we can do more...and we will do more.*

In an effort to target our resources better, I would like to take this opportunity to outline areas that the Chesapeake Executive Council identified for increased emphasis in the coming year:

- accelerating nutrient reduction
- preventing pollution
- restoring living resources and their habitats
- broadening public participation to include all groups, especially under-represented ones.

Over the coming months we will be reevaluating our 1987 Chesapeake Bay Program commitment to a 40% reduction of phosphorus and nitrogen entering the Bay by the Year 2000. Additionally, we must focus our resource management energies on those areas where risks are highest and resources most vulnerable.

State and local governments are working to address the ever increasing stresses on the Bay as growth and development in the watershed continue. Maryland's Commission on Growth has put forward recommendations aimed at alleviating the environmental consequences of development. Virginia's implementation of the Chesapeake Bay Preservation Act is stimulating communities to protect the waters of the Bay system. Pennsylvania is encouraging nutrient management on farmlands in a program that may be a model for the nation. The District of Columbia has introduced innovations in stormwater management. The Chesapeake Bay Commission has shown leadership in developing legislative initiatives designed to protect and improve the Bay.

The Chesapeake Bay Program is a growing, dynamic entity. The U.S. Environmental Protection Agency alone contributes almost $15 million in direct funding as well as $110 million in other Clean Water Act funding. Program funding has grown 33% since 1989. In addition, the other Bay partners make enormous financial commitments to the Bay cleanup effort. In April of 1990, Secretary of Defense Richard B. Cheney and I signed a Memorandum of Understanding between our agencies to demonstrate our joint commitment to the Chesapeake Bay Program. One example of the Defense Department's commitment is a pledge of an additional $100 million to Bay-related activities.

I want to express particular thanks to my Council colleagues, Governors Robert P. Casey of Pennsylvania, William Donald Schaefer of Maryland and Lawrence Douglas Wilder of Virginia; Mayor Sharon Pratt Dixon of the District of Columbia; and Delegate W. Tayloe Murphy, Jr., Virginia, Chairman of the Chesapeake Bay Commission. Their leadership is vital to the restoration of the Bay. So, too, are the members of the Maryland, Pennsylvania and Virginia congressional delegations. Their concern, their commitment and their support have remained steadfast and were underscored for me early in my tenure by a conversation with Maryland's Senator Mikulski, one of the Bay's foremost champions, who has urged us on time and again. I would also like to thank our advisory committees who are so tireless in their efforts on behalf of the Bay, and to recognize the good efforts of the organizations they represent. Many groups help solve problems, keep Bay issues before elected officials and the public — in short, they are an essential grassroots constituency without which progress would not be possible.

In the end, the welfare of the Bay will depend on the will and determination of all the citizens of the region. Working together, sharing a common commitment to the future health and productivity of the Chesapeake Bay, we can succeed. We *will* succeed. We must remain vigilant, we must remain vigorous as we pursue our environmental goals. Only in this way can we improve the quality of life for ourselves and future generations.

William K. Reilly
Administrator
U.S. Environmental Protection Agency
Chairman, Chesapeake Executive Council

Table of Contents

Foreword i

The Beginnings of a Model Program 1

A Framework for Action 2

Paying the Bills 4

Recent Progress 5

Life on the Bay 7

Impacts of Growth 9

Acknowledging Challenges 12

Sources of Pollution 14

Preventing Pollution 15

A Priority Listing 16

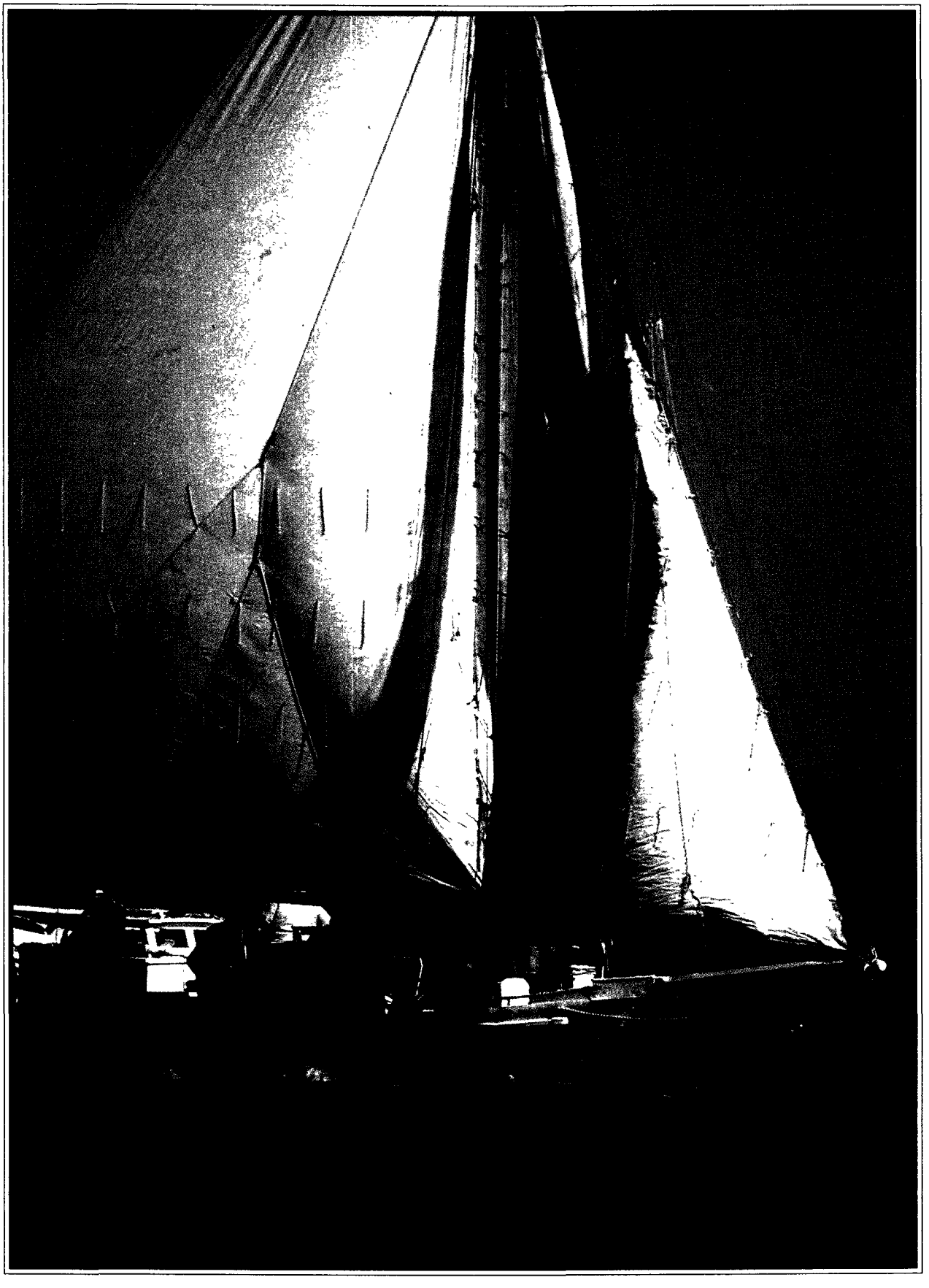
Reducing Polluted Runoff 17

Tributaries to the Bay 19

An Informed Public 20

On the Horizon 21

Acknowledgments 23



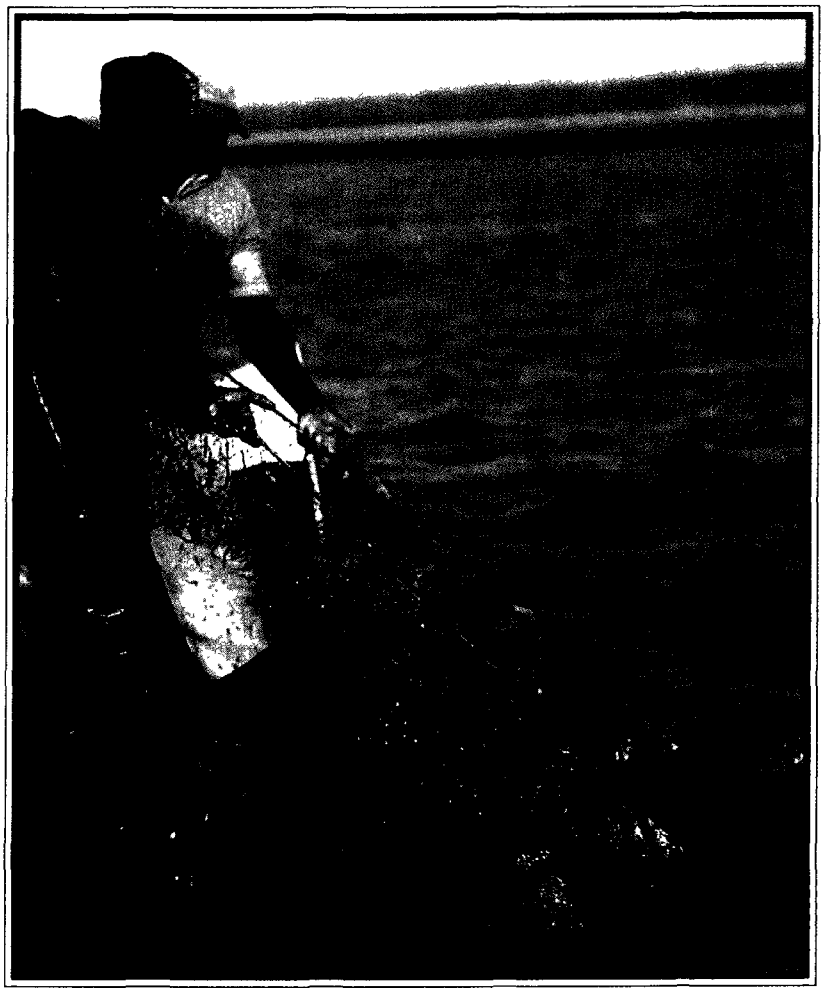
The Beginnings of a Model Program

The Chesapeake Bay Program has been in existence since the mid 1970s. This progress report is intended to give you a quick overview of the program's many accomplishments, as well as a look at the challenges we face in the near future. After reading this document we hope you will share our sense of pride in what has been accomplished and our sense of urgency for what remains to be done. Remember...the Chesapeake Bay belongs to all of us.

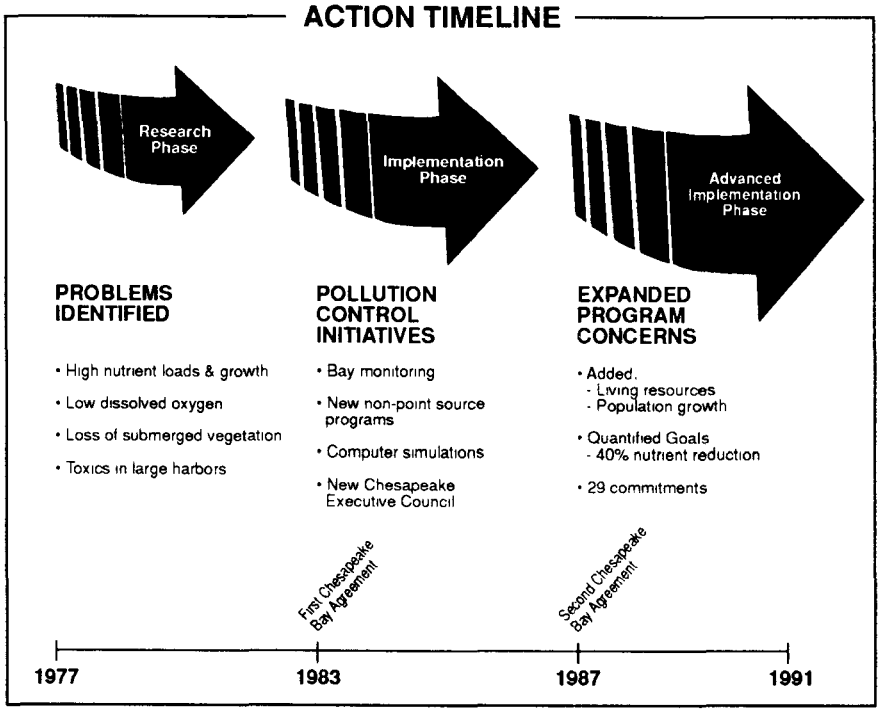
The Chesapeake Bay is estimated to be over 10,000 years old with a surface area of over 2,200 square miles and a water volume of 18 trillion gallons. The Bay estuary is the largest in the nation. It is fed by over 150 tributary rivers and streams and supports over 2,500 species of plants and animals as well as 13 million people.

Knowledge about the impact of man's modern day life-style on the environment has greatly advanced in the past two decades. In 1972, the Chesapeake Bay was the first estuary to be targeted for restoration and preservation. At that time, Congress directed the U.S. Environmental Protection Agency (EPA) to launch a major study to investigate the causes of the Bay's environmental decline. The findings and recommendations, produced by that $27 million research program, formed the foundation for the first Chesapeake Bay Agreement signed in 1983. In that agreement the Environmental Protection Agency, in partnership with the governments of Virginia, Pennsylvania, Maryland, the District of Columbia and the Chesapeake Bay Commission (an interstate legislative coordinating body), agreed to develop and implement coordinated plans to improve and protect the water quality and living resources of the Chesapeake Bay estuarine system.

The 1983 Agreement moved the program out of the research phase



The Chesapeake Bay supports over 2,500 species of plants and animals as well as 13 million people.



and into an action phase by defining water quality and related issues.

The Second Bay Agreement was signed in December 1987. This 1987 agreement expanded the scope of the 1983 agreement in the form of 29 commitments for action. These commitments outlined steps to be taken in six areas:

- living resources
- water quality
- population growth & development
- public information, education & participation
- public access
- governance

The agreement clearly established that the productivity, diversity and abundance of the estuary's plants and animals (referred to as living resources) would be used as the ultimate measurement of the Chesapeake Bay's condition. In this way, the program translated Chesapeake Bay research results into action plans.

In addition to dealing with the vital issues of Bay restoration, the 1987 Bay Agreement also committed to improving public access to the Bay and its tributaries. It was determined that less than one percent of the Bay and tributary shoreline was in public ownership. Strategies have been developed to improve access on existing public lands, including:

- development of a signage plan which will make it easier for the public to locate existing sites
- a proposed "trail blazer" logo to direct people to access areas
- identification of publicly held lands for future development as access sites
- completion of the Chesapeake Bay Area Public Access Plan.

▶ A Framework for Action

To provide leadership and promote mutual cooperation within the Chesapeake Bay Program, the program is directed by the Chesapeake Executive Council, comprised of:

- The Governor of Maryland
- The Governor of Pennsylvania
- The Governor of Virginia

- The Mayor of the District of Columbia
- The Chairman of the Chesapeake Bay Commission
- The Administrator of the Environmental Protection Agency

A Principals' Staff Committee (comprised of cabinet level officials) provides support for the Executive Council.

Supervising day-to-day program direction, a 28-member Implementation Committee (with representatives from federal and state agencies, regional and legislative commissions, and advisory committees) has primary responsibility for planning and overseeing the activities initiated by the Executive Council. This work is divided among eight subcommittees:

- Nonpoint Sources
- Toxics
- Monitoring
- Modeling
- Living Resources
- Public Access
- Population Growth & Development
- Public Information & Education

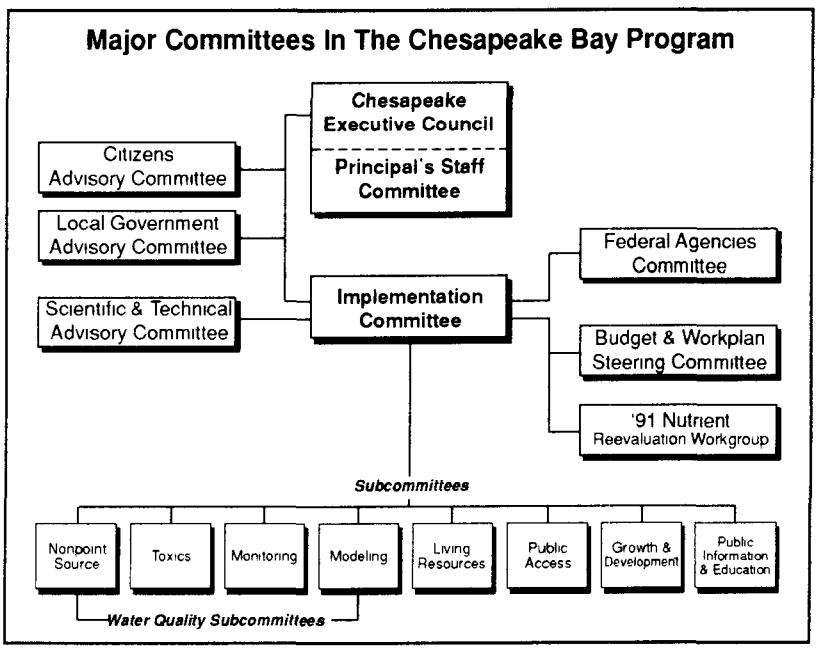
Providing advisory support to the Executive Council, three committees play key roles in broadening participation and maintaining contacts with the research community, other levels of government, citizen organizations, and business and trade groups. These functions are carried out by the following committees:

- Citizens Advisory Committee
- Scientific and Technical Advisory Committee
- Local Government Advisory Committee

In support of the program are three additional committees geared to address specific areas or needs:

- Federal Agencies Committee
- Budget & Workplan Steering Committee
- 1991 Nutrient Reevaluation Workgroup

The Environmental Protection Agency's Chesapeake Bay Program Office provides administrative and technical support.



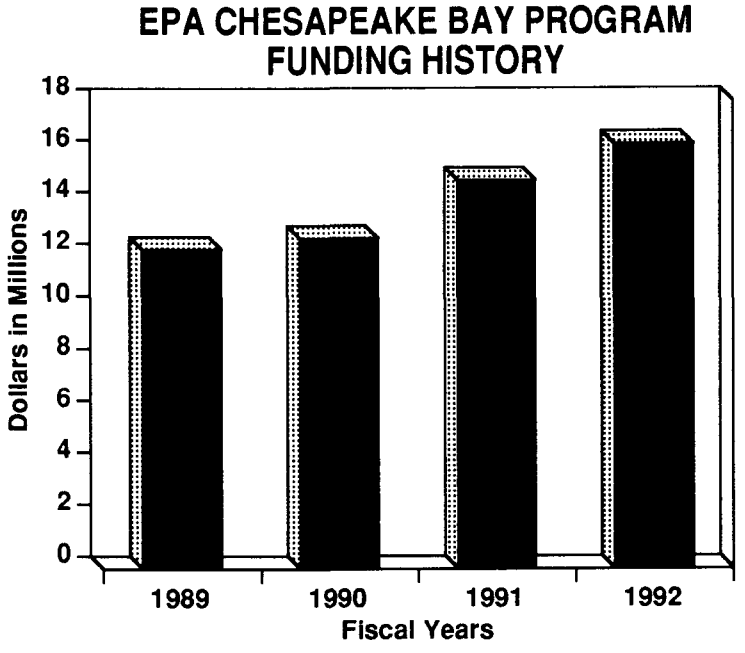
EPA maintains two offices; one in the regional office in Philadelphia, Pennsylvania and the other in Annapolis, Maryland. Both offices help coordinate the work of the Bay Program and, through grants, help support many state efforts as well as organizations that are active in the Bay restoration effort.

In addition to the formal Chesapeake Bay Program structure, many public and private agencies as well as thousands of individuals are participants in a full range of scientific, regulatory, educational, administrative and other related activities that contribute toward the objective of a cleaner Chesapeake Bay.

▶ Paying the Bills

Funding for the Chesapeake Bay Program comes from a variety of sources. Federal and state budgets, as well as many other sources, including the District of Columbia and the Chesapeake Bay Commission, allocate money to support the Bay Program.

EPA provides a baseline of support under the Clean Water Act. As the figure below shows, this baseline has grown steadily. The President's budget for FY 1992 contains $16.3 million for this effort. Other important funding is contributed by many sources. Other EPA programs, for instance, account for $110 million annually. The states of Pennsylvania, Virginia, and Maryland as well as the District of Columbia contribute over $200 million to the Bay effort. Federal agencies (other than EPA) are spending an additional $142 million in 1991 for Bay-related activities.



The federal participants include:

- Department of Agriculture
  - — Agricultural Stabilization and Conservation Service
  - — Soil Conservation Service
  - — U.S. Forest Service
- Department of Commerce
  - — National Oceanic and Atmospheric Administration
- Department of the Interior
  - — United States Fish and Wildlife Service
  - — United States Geological Survey
  - — National Park Service
- Department of Defense
- United States Coast Guard
- Smithsonian Institution

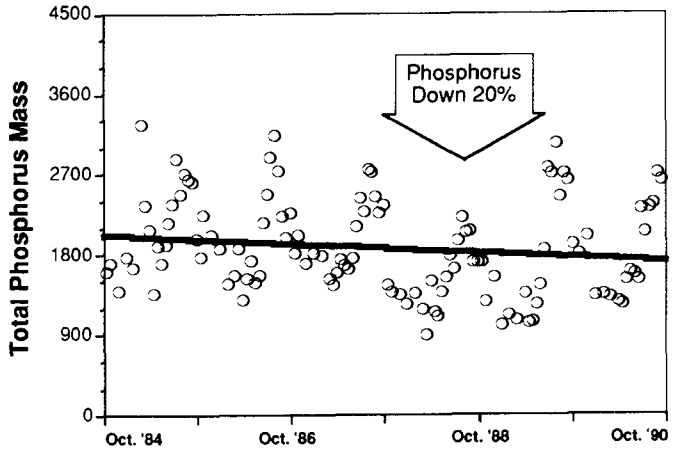
Local governments also advocate and implement many activities that directly and indirectly contribute to the objectives of the Chesapeake Bay Agreement.

Recent Progress

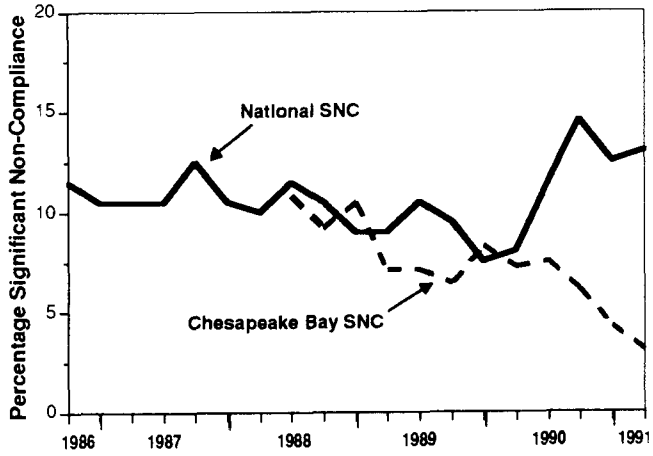
Recent years have brought significant progress:

- There is a continuing fall in levels of phosphorus
  - — total phosphorus down 20% since 1985
  - — dissolved inorganic phosphorus (one form of phosphorus) down 41% since 1985
  - — this allows a greater supply of oxygen to support plant and animal life
- Submerged aquatic vegetation (SAV or underwater grasses) implementation plan was completed
  - — defines survival needs and restoration goals
  - — SAV coverage is up 57% since 1984 in the mid-Bay region
  - — providing habitat for animal life
- Striped bass (or "rockfish") are increasing, again allowing sport and commercial fishing for this popular fish
  - — five year fishing moratorium caused by reduced numbers was lifted in 1990

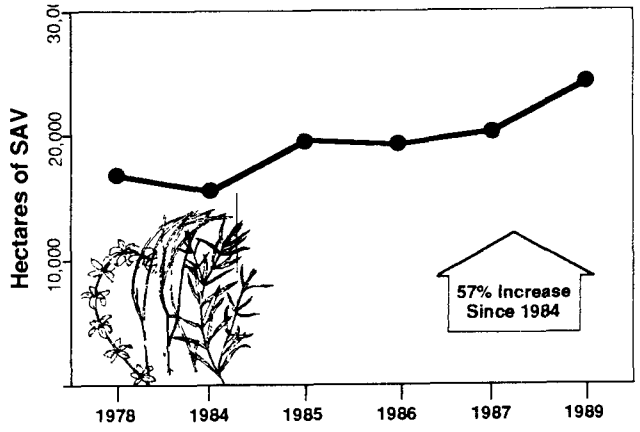
Total Phosphorus Dropped Significantly



Chesapeake Bay Industrial & Municipal Facilities in Significant Non-Compliance Dramatically Reduced



Submerged Aquatic Vegetation Increasing Mid-Bay

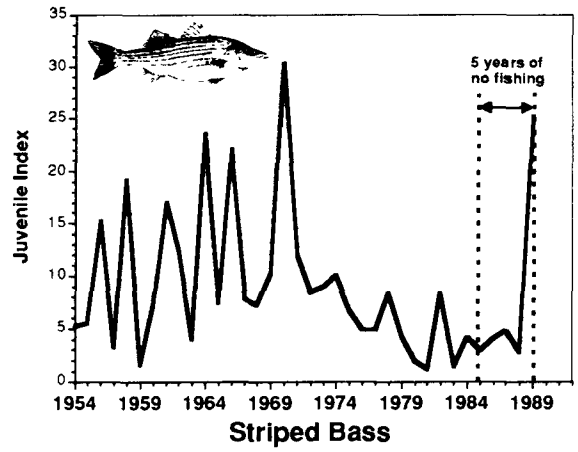


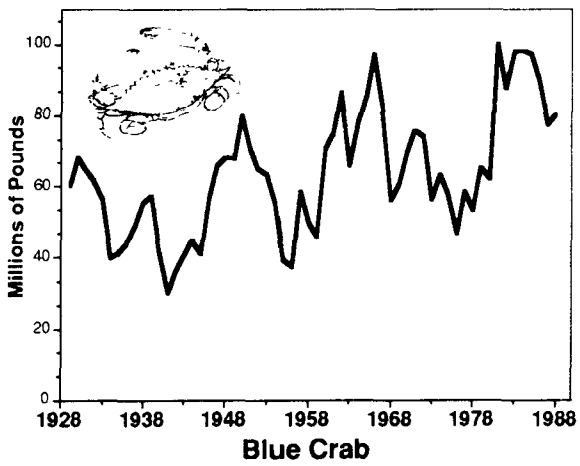
Environmental Protection Agency Administrator William K. Reilly and Department of Defense Secretary Richard B. Cheney sign an historic Chesapeake Bay Program memorandum of understanding outlining compliance initiatives, as well as other restoration actions, to be undertaken at Chesapeake Bay defense facilities (April 1990).

- Family fishing programs were held to provide recreational opportunity as well as increased awareness of environmental issues
- Fishery management plans were completed in 1990 for other species:
  - — bluefish
  - — weakfish/spotted seatrout
- Chesapeake Bay Program has begun an annual strategic planning process to:
  - — reassess priorities for budget and committee work
  - — set themes for new directions for the program
- A significant project was completed in public access with the development of the "Chesapeake Bay Area Public Access Plan." For the first time, a complete picture of the Bay's public access system has been compiled and areas of need identified.
  - — In addition, a Technical Assistance Report detailing how to plan and develop different types of public access areas was produced as a companion to the Access Plan.
- Implementation plan for wetlands was completed
  - — a federal permit tracking system will determine what types of activities will be allowed in wetlands areas
  - — a baseline inventory will show where the wetlands are and a monitoring program will show the functions and values they provide
- An independent panel, appointed by the Executive Council, completed an evaluation of the effectiveness of nonpoint source controls and offered recommendations ("nonpoint source" is runoff from pastures, cropland, lawns, urban areas, etc.)
  - — one recommendation was to develop standardized nutrient management plans
- The compliance goal to reduce significant noncompliance by major wastewater dischargers by 50% was exceeded
  - — currently, 3.1% of the 327 major facilities in the Bay basin are in significant noncompliance of wastewater discharge permit levels (compared to a 13% national non-compliance rate)
- The goal to bring the 50 federal facilities in the watershed into compliance with all major environmental requirements showed a 94% improvement during 1990
  - — 47 of the 50 facilities were in compliance or covered by enforceable compliance schedules by the end of 1990

- A Toxics of Concern List was completed
  - — 14 toxic substances which adversely affect or have the potential to cause damage to the Bay system were identified
  - — will help target program resources
- Recreational boats, another source of pollution in the Bay, were targeted for special attention
  - — Chesapeake Bay Program accepted boat pollution report
  - — designation of "no-discharge" zones was recommended
- Local Government Advisory Committee accomplishments
  - — Chesapeake Bay local government innovative method manual was created and distributed
  - — held workshop on household hazardous wastes to assist local governments with disposal options
- Scientific accomplishments
  - — extensive research into causes of submerged aquatic vegetation decline which has spurred management action resulting in abatement and monitoring strategies
  - — determined living resource and human implications concerning chemical contaminants
- Citizens Advisory Committee accomplishments
  - — recommendations on growth and development policy
- Developed a working model of the Chesapeake Bay
  - — allows development of cause and effect data through computer models

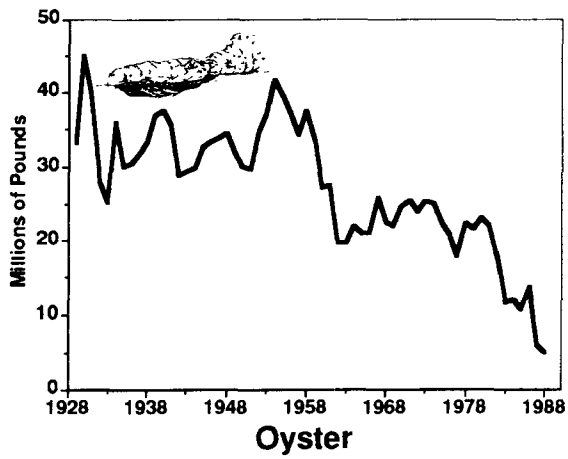
Environmental Indicators:

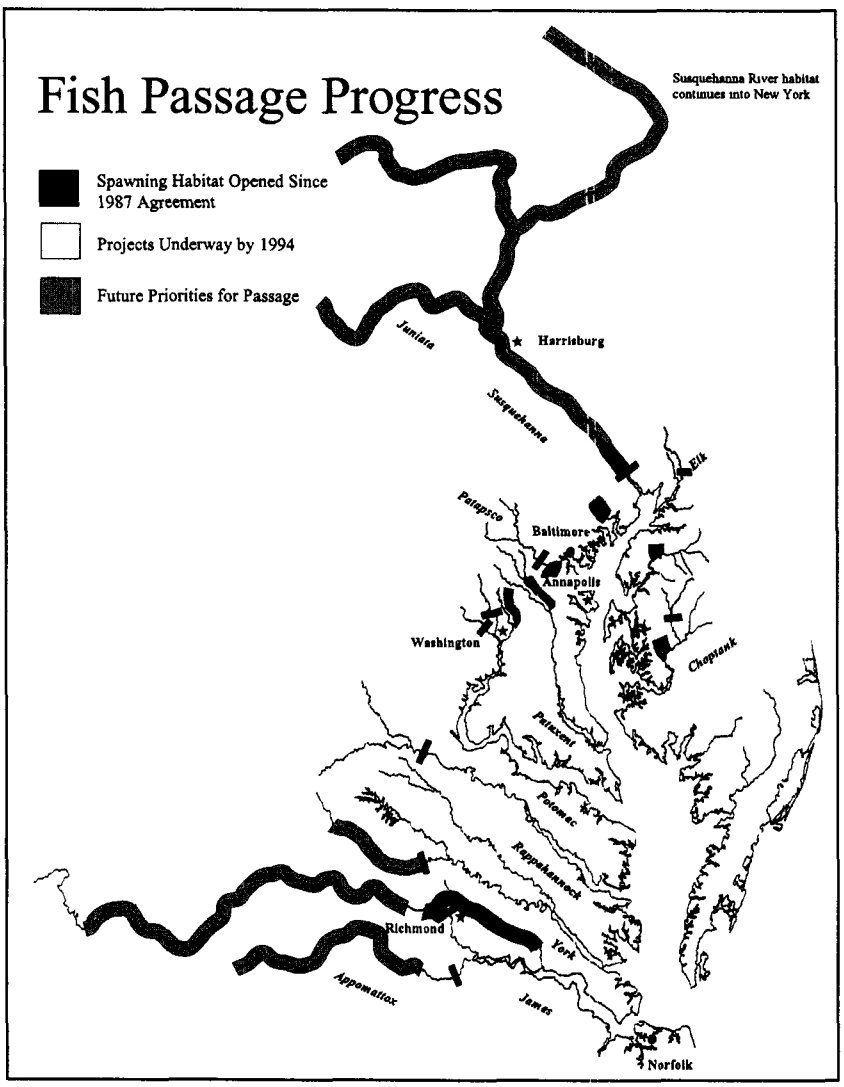




Life on the Bay

Over the last few years some Chesapeake Bay plants and animals (living resources) have shown signs of recovery. Proof of their increase in numbers can be demonstrated through a variety of indicators, for example, the partial lifting of the fishing ban on rockfish. Bay grasses continued to increase mid-Bay. Over the past year, fish that live in saltwater areas of the Bay but move to freshwater for spawning have been helped by the removal of barriers to their migration. Bald eagle nests along the Bay's shoreline have shown steady increase. To encourage preservation of Bay wildlife and their habitat, the Bay Program has developed extensive management plans which are designed to promote a coordinated approach to the restoration and preservation of regional living resources.





Additional living resource accomplishments:

- Bluefish Management Plan
  — implement ten fish limit
- Weakfish and Spotted Seatrout Management Plan
  — propose 12 inch minimum size limit for seatrout
- Waterfowl Management Plan
  — improve water quality and wetlands habitat
- Wetlands Policy Implementation Plan
  — monitor mapping, status and trends, permit tracking
- Submerged Aquatic Vegetation Policy Implementation Plan
  — establish restoration goals
- Alosid (Shad and Herring) Management Plan
  — transplant species to enhance restoration
- Blue Crab Management Plan
  — contain harvest at present levels
- Oyster Management Plan
  — assess stock and identify diseases
- Striped Bass (Rockfish) Management Plan
  — maintain limited harvest season
- Conowingo fish passage facility completed
  — projected record 30,000 American Shad will pass through facility in 1991 (as compared to 1,500 in 1985)
  — an additional 25 miles of streams were reopened
- Baywide Resource Management Strategy Annual Report
- Preparation of Fish Passage Annual Report

While we have accomplished much in the area of living resources, there is much that can still be done. Living resources and their habitats will continue to be a prime focus for the future of the program.

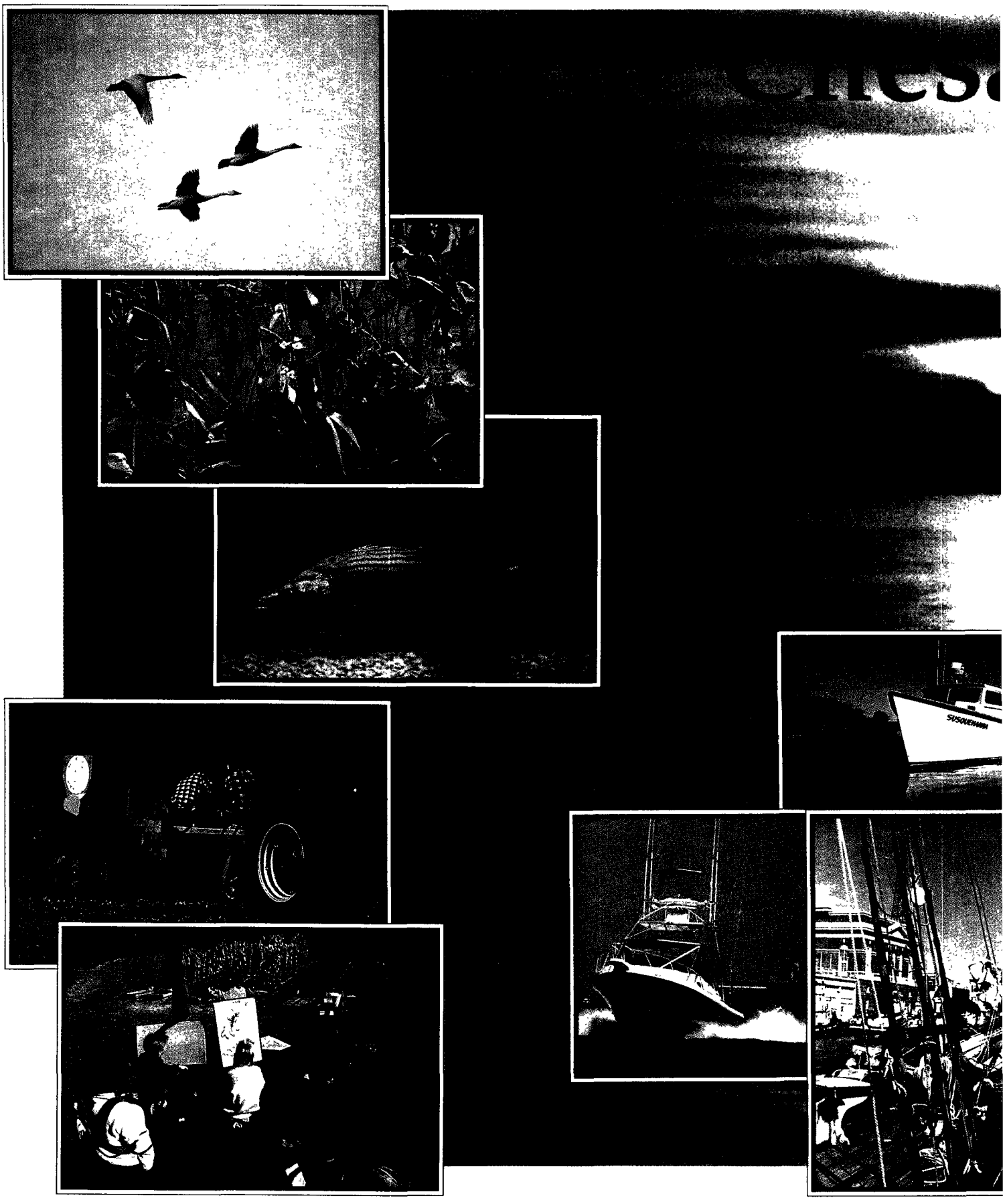
Impacts of Growth

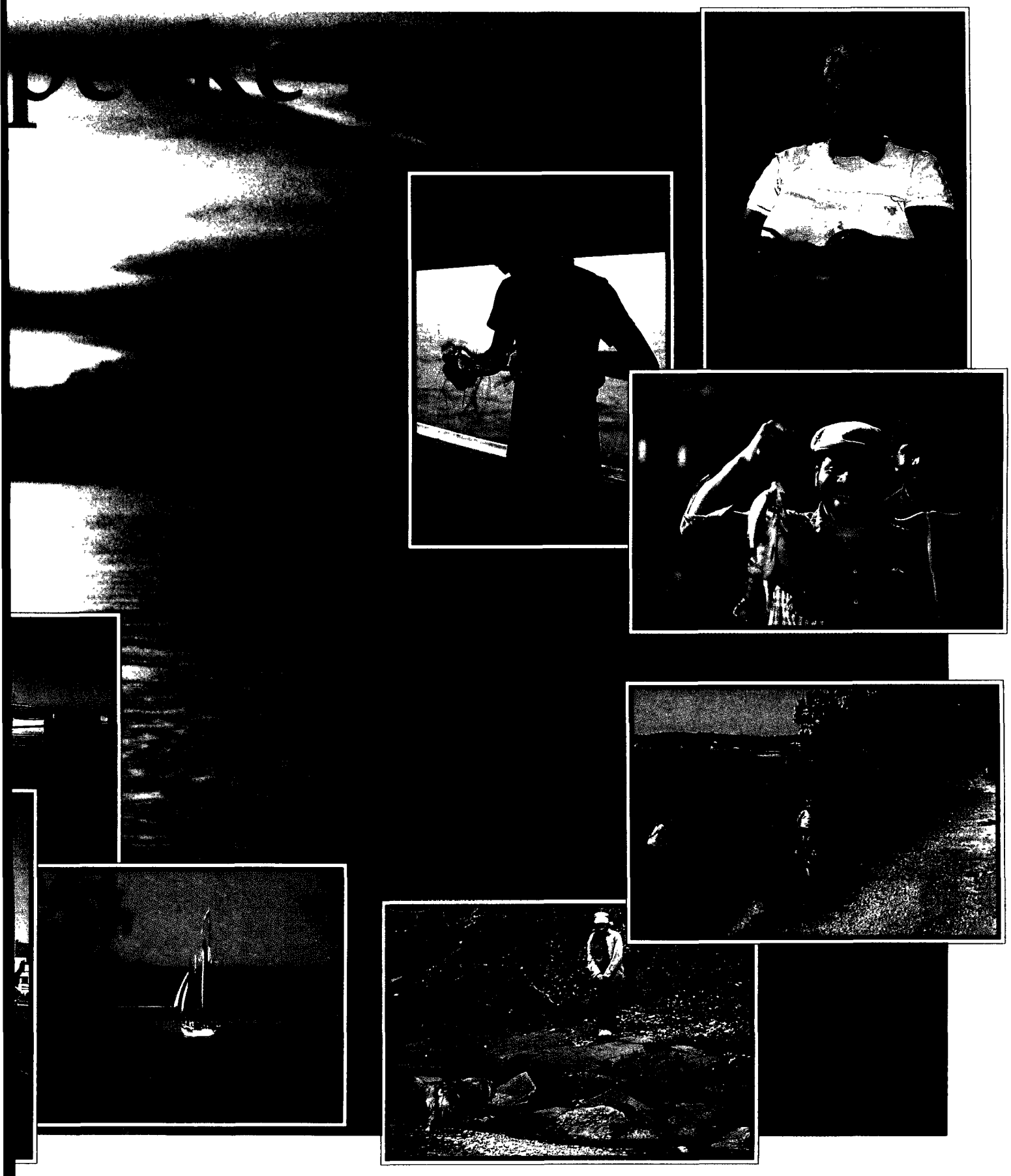
Population growth and development have long been recognized as issues that need to be addressed by the Bay community. Population growth from today's estimated 13 million people to a projected 17 million people by the year 2020 must prompt us toward greater implementation of responsible management practices. As regional population increases, so will the demands on the Bay's environmental resources. We must prepare to meet these demands.

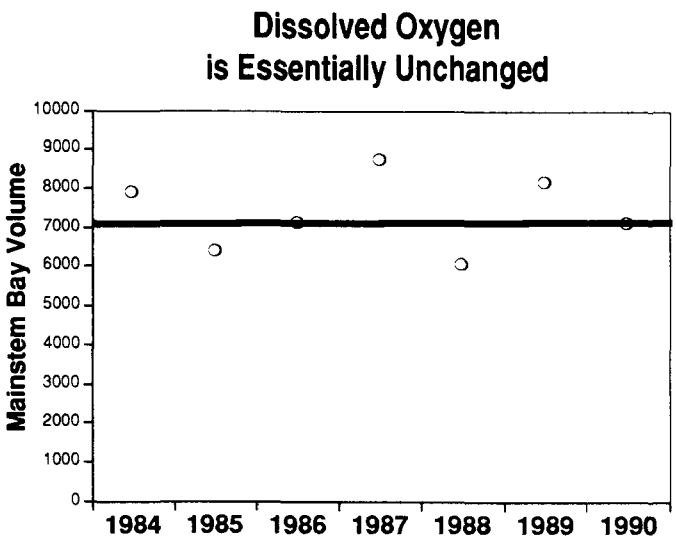
The Bay jurisdictions took different paths over the past year to address the recommendations of the Year 2020 Panel Report on population growth and development in the Chesapeake Bay basin.

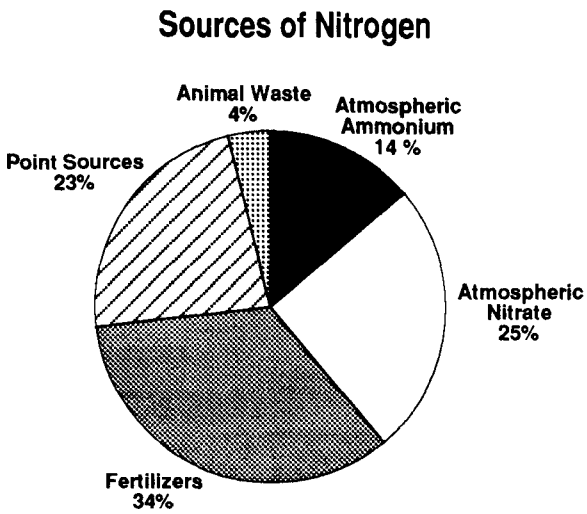
- The U.S. Environmental Protection Agency began developing the capabilities to provide data on growth issues and technical assistance to state and local governments.
- In Maryland, the Governor's Commission on Growth in the Chesapeake Bay Region recommended a stronger state role in coordinating future growth and channeling resources to areas that can best accommodate new development. County and municipal governments would retain responsibility for specific land use planning and regulation.
- In Virginia, the Commission on Population Growth and Development was transformed from a legislative study group to a full-fledged legislative commission and given an extended mandate to develop recommendations for dealing with development issues.
- Pennsylvania worked directly with local governments to educate them on available tools to plan for population growth and development. Activities included development of the slide/video presentation "Good Neighbors" and a growth management conference based on the new handbook for local officials, Guiding Growth: Building Better Communities and Protecting our Countryside.
- The District of Columbia, challenged with a different set of growth and development issues, is implementing innovative methods for growth management.

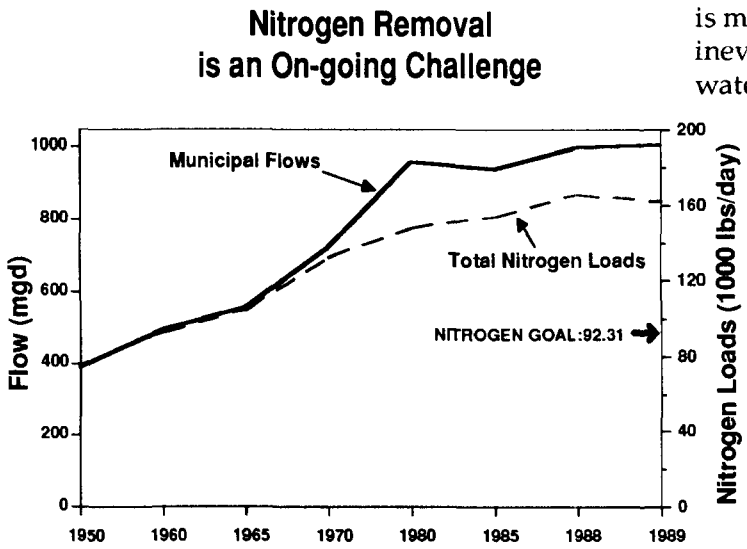
Overabundance of phosphorus and nitrogen causes many species to compete for a depleted oxygen supply.


SUSQUEHANNA









Acknowledging Challenges

The Chesapeake Bay's living resources — its fish, shellfish, waterfowl, underwater vegetation, and the many other plants and animals whose survival is linked to the Bay system — are a major concern of the Bay Program. It was their declining numbers that first called attention to the degradation of the Bay. And it is the re-birth of their abundance that signals the success of the restoration effort.

The measurement of our success is not an easy one. A comprehensive monitoring system tracks changes in the Bay, but short-term fluctuations are not readily related to specific pollution control activities.

The unpredictable weather — wet years, dry years, and the subtle climatic changes that take place over a span of many years — has a tremendous impact on all forms of life in the Bay. Diseases, such as the oyster-devastating MSX and Dermo, may or may not be related to changes in habitat and other conditions altered by human activity.

In short, it is difficult to separate natural changes from those brought about by the growing numbers of people who populate the Bay basin and the environmental impacts that come with development. One of the great challenges we face is maintaining the delicate balance between the inevitable growth and development of the watershed and the living resources of the Bay.

The environmental indicators shown throughout this publication give us a general view of the state of the Bay. Many species are fully capable of maintaining and increasing their population in their present environment, yet overfishing and the destruction of habitats has caused decline.

IDENTIFIED PROBLEMS FOR TARGET SPECIES IN THE CHESAPEAKE BAY

	DISSOLVED OXYGEN	NUTRIENTS	LIGHT ATTENUATION	SUSPENDED SOLIDS	pH (Acidity)	CONTAMINANTS	PETROLEUM	DISEASES	OVERHARVEST	SPAWNING BLOCKAGES	LAND USE/DEVELOPMENT	LOSS OF SAV	HUMAN DISTURBANCE	OTHER
SAV (Submerged Aquatic Vegetation)		●	●	●		◒					○			◒
OYSTER	○	○		●		◒	◒	●	●		○			●
SOFT-SHELL CLAM	○	○				○	◒	○	○					○
HARD CLAM	○	◒		◒		◒	◒		○		○			●
BLUE CRAB	●					◒			○		○	○		○
MENHADEN	◒							◒	○					
BAY ANCHOVY	◒					○								◒
SHAD	○			◒	●	◒			●	●	○			
HERRING	○			◒	●	◒			●	●	○			
SPOT	◒					○								
WHITE PERCH	◒			○		◒			○					
STRIPED BASS	◒			○	●	●			●					◒
YELLOW PERCH	○	○		●	●	◒			◒	●	○			○
WOOD DUCK						○	○		○		◒		○	○
BLACK DUCK						○	○	○	◒		◒	●	◒	○
CANVASBACK						○	○		◒			●	○	○
REDHEAD						○	○		◒			●	○	
COLONIAL WATERBIRDS						○	◒				◒	○	○	
OSPREY						◒	○				◒		○	
BALD EAGLE						◒	○				●		●	●

Adapted from Habitat Requirements for Chesapeake Bay Living Resources, Second Edition, 1991.

LEGEND

● Known to have major impact on species or habitat

◒ Known to have local impacts on species or habitat

○ Potential problem or uncertain impact

Sources of Pollution

An overabundance of the nutrients phosphorus and nitrogen is the fundamental cause of the explosive growth of algae in the Bay. The algae feed on the nutrients, increase coverage in the Bay, block out sunlight that Bay grasses need to survive and deplete oxygen levels. Oxygen is essential to all life in the Bay. This overabundance of nutrients triggers a downward spiral of plants and animals competing for the depleted oxygen.

Despite the uncertainties about environmental cause and effect, there is a clear consensus that excessive nutrient enrichment is hazardous to the health of the Bay's living resources.

Phosphorus and nitrogen enter the Bay from point sources (municipal wastewater treatment plants and industrial plants) and nonpoint sources (runoff from pastures, cropland, lawns and urban areas).

Monitoring data show a 20% decrease in mainstem Bay water column phosphorus levels from 1985 to 1990. This trend is attributed primarily to point source reductions. Phosphate detergent bans that have been implemented basinwide over the last few years also play an important role in the phosphorus reduction. More efficient phosphorus removal in treatment plants contributed to the reductions despite a significant growth in wastewater flows related to population increases.

The adverse effects of nitrogen and phosphorus on Bay water quality were documented during the research study of the Chesapeake Bay. In the case of toxic contaminants, the study pinpointed "hot spots" (principally Baltimore Harbor in Maryland and the Elizabeth River in Virginia), but there was no clear picture of the extent or seriousness of the problem for the Bay as a whole. Integrated research and monitoring is improving our understanding. In addition to broadly applied controls, the Chesapeake Bay Program has developed information through research and evaluations to pinpoint toxic problems specific to the Chesapeake system.

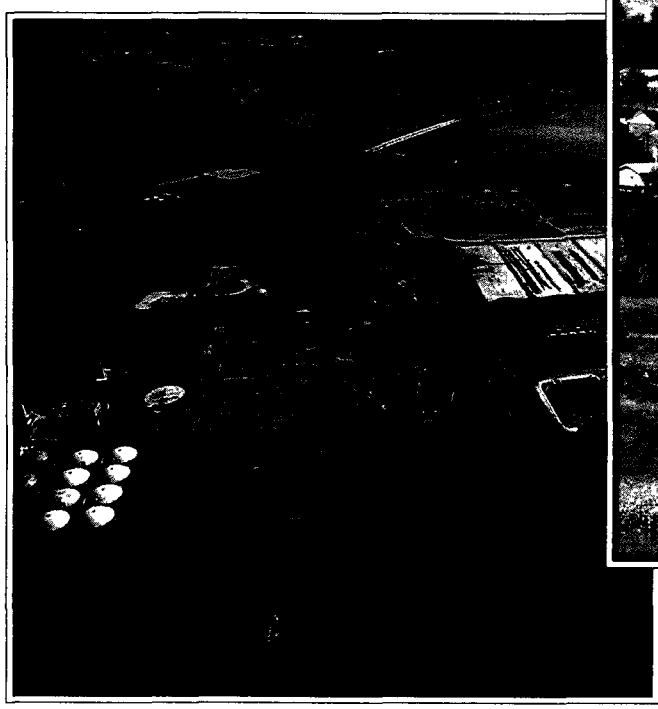
Nitrogen removal has not been as successful to date. 1990 Bay levels are essentially unchanged since 1985. In an effort to improve nitrogen reduction, seven wastewater treatment plants initiated nitrogen removal since 1987. Similar improvements are now in the works at more than 40 other plants in the watershed.

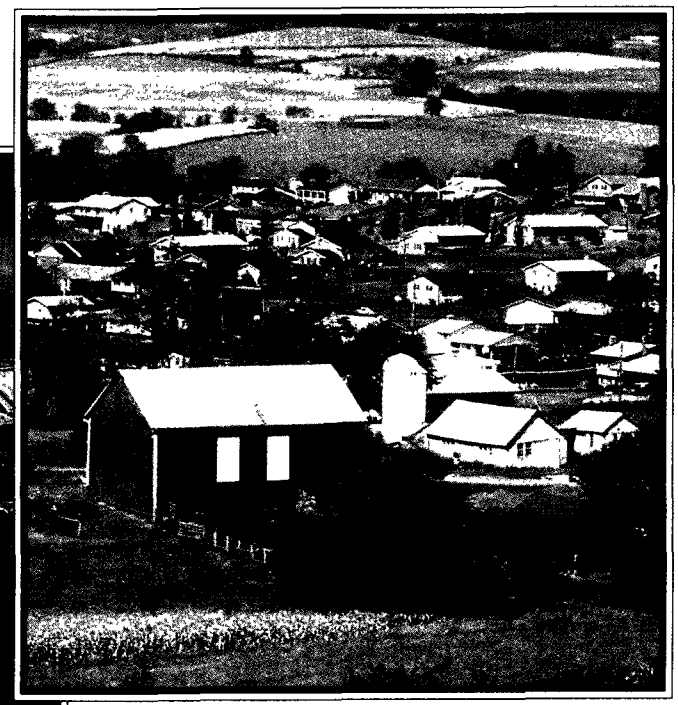
Preventing Pollution

In 1990, the Executive Council created an independent panel to assess the nonpoint sources of pollution within the Bay watershed. An increased emphasis on the management of nutrients from animal waste and fertilizers was strongly recommended by the panel, whose membership included farming, forestry and environmental interests. The panel concluded that program improvements are essential to achieve a 40% reduction in nutrients. Its recommendations included:

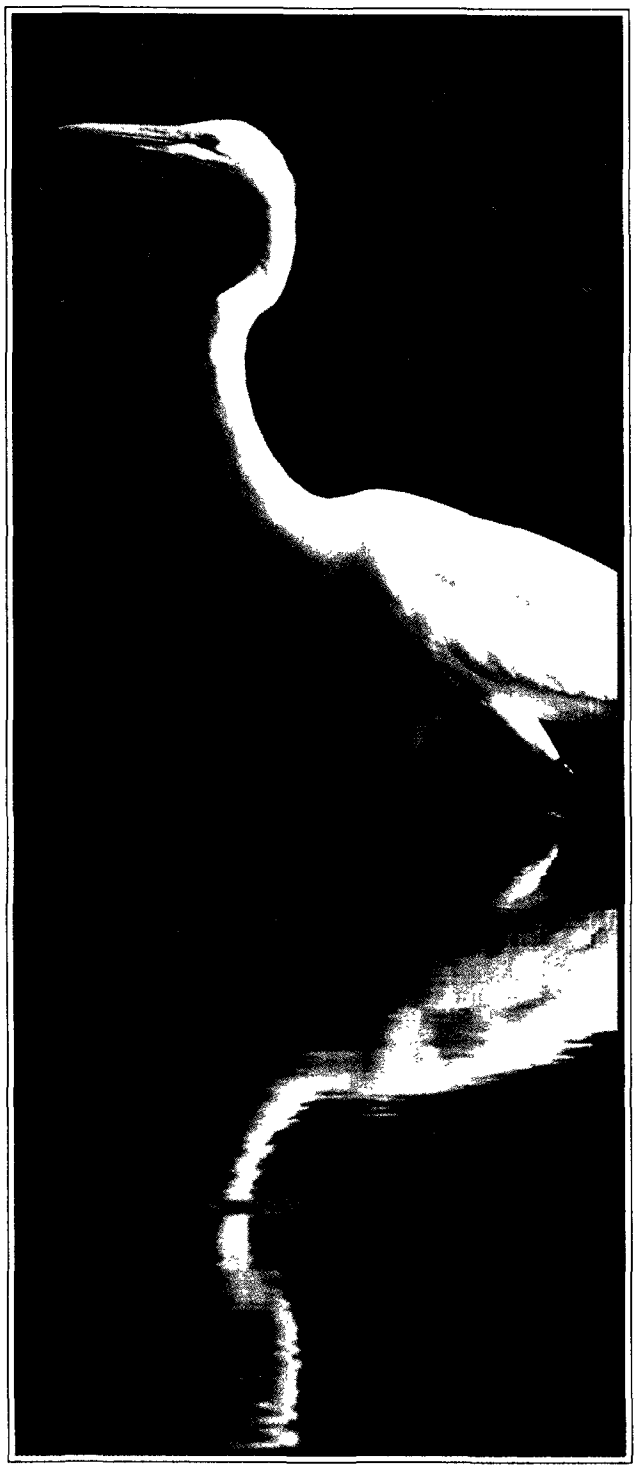
- improved program targeting
- more aggressive state programs to manage animal wastes
- increased state emphasis on controlling urban nutrient sources
- improved education programs
- improved land management
- development of a "mass balance system" to more accurately measure all nutrients entering, moving through, and leaving the Bay system.

More efficient phosphorus removal in treatment plants contributed to a reduction in phosphorus entering the Bay.





14,000 acres in Pennsylvania, Maryland and Virginia are covered by nutrient management plans, which have succeeded in preventing 1,797 tons of nitrogen and 2,006 tons of phosphorus from reaching the Bay.



Our living resources — fish, shellfish, waterfowl, underwater vegetation, and many other plants and animals whose welfare and even survival are linked to the Bay system — are a major concern of the Chesapeake Bay Program.

In addition, the Bay Agreement signatories committed to undertake a comprehensive approach to the Bay cleanup by eliminating the discharge of toxic substances (chemical contaminants) from all controllable sources. The toxics issue presents a totally different kind of challenge than nutrient overabundance.

A Toxics of Concern List (TOCL), completed in January 1991, identified 14 substances that are adversely affecting the Bay system now or have the potential to do so in the future. The listing is to be updated every two years.

One major toxic pollution issue demonstrates a Bay success. The toxic effects of tributyltin (TBT) in anti-foulant boat paints were first recognized in the U.S. in the Chesapeake Bay. The research carried out in the Bay led to the tightly drawn restrictions on the use of TBT paint that are now in effect nationally.

▶ A Priority Listing

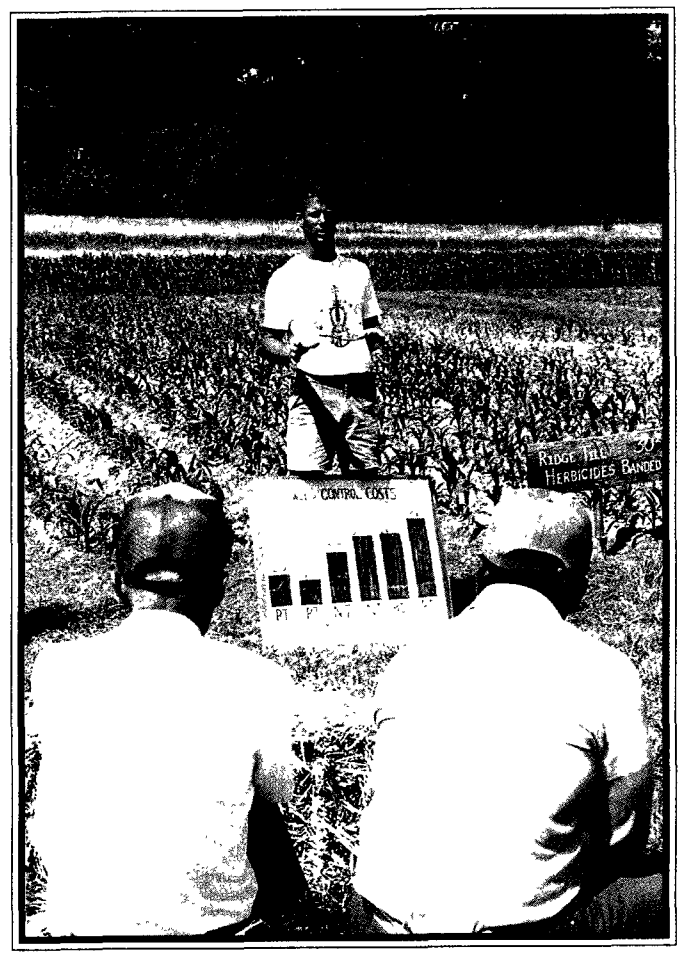
The TOCL workgroup recommended the following toxic substances have priority in any toxics research sponsored by the Bay Program. They should receive priority attention in new water quality criteria adopted under state regulatory programs and other water pollution control efforts.

The first TOCL includes:

- TBT (tributyltin)
- Heavy Metals: Cadmium, Chromium, Mercury, Copper, Lead
- Pesticides: Atrazine, Chlordane
- Polychlorinated biphenyls (PCBs)
- Benzo(a)anthracene and benzo(a)pyrene
- Chrysene
- Fluoranthrene
- Naphthalene

Development of a basinwide toxics loading inventory is being completed. It will provide a comprehensive estimate of the levels of specific contaminants reaching the Bay from both point and nonpoint sources throughout the Bay region. In this way we can best target resources for program development, especially in pollution prevention activities.

Another method of controlling toxic contaminants was developed in 1990, when the first basinwide survey of pesticide use was completed. A major element of the basinwide toxics reduction program is Integrated Pest Management (IPM). Under IPM, for example, toxic chemicals are used to control pests only when they directly threaten crops. IPM not only helps save the environment, it saves money for farmers employing these methods as well. A number of IPM demonstrations are underway in the watershed. There is an increased interest in bringing IPM to urban areas, thereby limiting the use of chemicals on residential lawns as well as croplands.



A major element of the basinwide toxics reduction program is Integrated Pest Management. IPM not only helps save the environment, it saves money for farmers employing these methods as well.

Reducing Polluted Runoff

Controlling nutrients from nonpoint sources continues to be a challenge because of the diversity of nonpoint sources. One promising development in controlling nutrients is the increasing use of nutrient management programs on farms in the Chesapeake basin. This technique, pioneered in Pennsylvania, balances fertilizer applications with actual crop needs, helping ensure that there is no excess fertilizer transported to the Bay through erosion or groundwater flows.

Pennsylvania recently established a special committee to recommend improvements to its existing nutrient management program. As a result of recommendations of the Governor's Select Committee on Nonpoint Source Nutrient Management, legislation was introduced to establish a statewide program to manage nutrient runoff.

To date, 114,000 acres in Pennsylvania, Maryland and Virginia are covered by nutrient management plans. Nutrient management plans have succeeded in:

- preventing 1,797 tons of nitrogen and 2,006 tons of phosphorus from reaching the Bay

- decreasing fertilizer sales by 24% in the three Bay states, while national sale of fertilizers have dropped by only 16% (data based over a ten year period).

Nationally, the Chesapeake Bay Program has been a leader in implementing nonpoint source controls. Since 1985, the Bay Program has provided nearly $44 million in federal grants to fund nonpoint programs. The states and the District of Columbia matched these funds dollar for dollar.

In agricultural areas, these outlays assisted farmers in the application of "Best Management Practices" such as nutrient management plans, animal waste storage facilities, and sediment erosion controls. Through mid-1990, the program has helped farmers:

- install more than 11,000 individual control measures
- treat more than 268,436 acres to reduce sediment loss
- install 1,300 systems to manage 2.7 million tons of manure
- prepare over 600 nutrient management plans
- evaluate the effectiveness, cost and feasibility of using biological nutrient removal at wastewater treatment plants throughout the watershed.

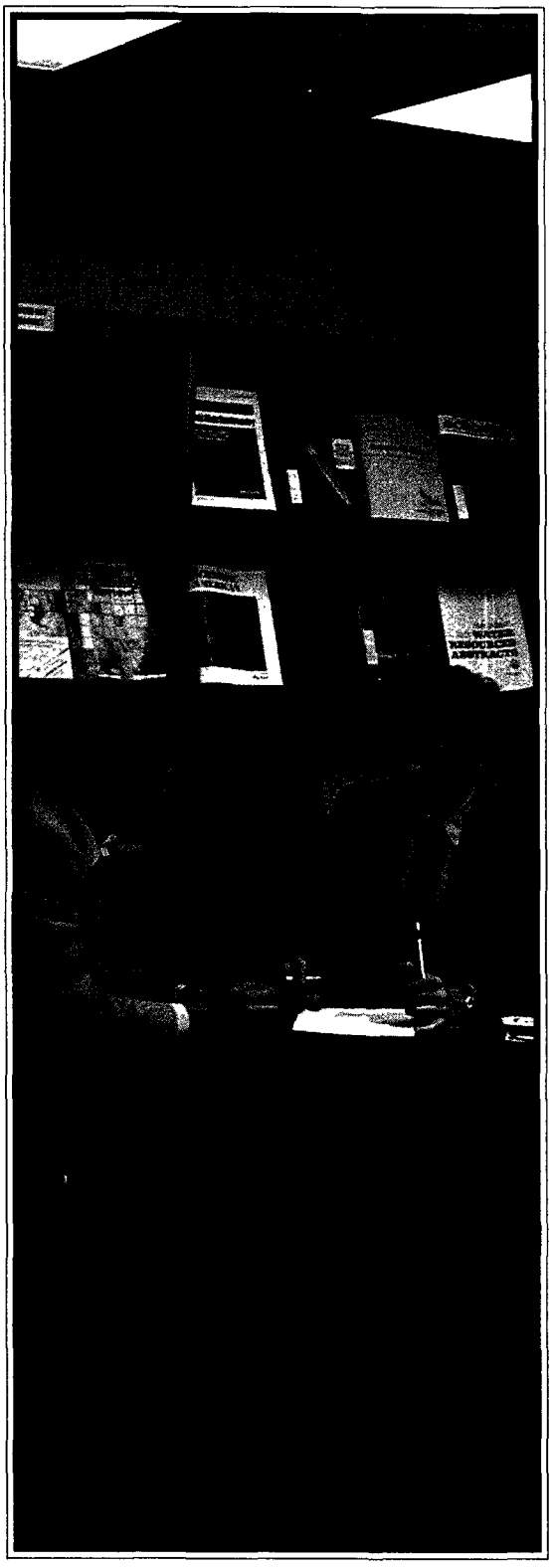
Over the last few years Chesapeake Bay plants and animals (living resources) have shown signs of recovery.

Tributaries to the Bay

The restoration and protection of the Chesapeake Bay has long been a model for the protection of other vulnerable estuaries throughout our nation. We have learned that it is important to apply this same energy and approach to other parts of our own watershed.

The Bay has six major and 140 minor tributaries that must be improved before the Bay is indeed returned to health. Programs patterned after the Bay Program are now active on the Anacostia River and will soon be developed on the Patuxent River.

Concentrated studies are underway on many more sites including Maryland's targeted watersheds, Owl Run and Nomini Creek in Virginia, and the Conestoga River in Pennsylvania. These studies and protection efforts are strong evidence that our commitment to the Bay's cleanup is sustained by growing local interest and success.



Keeping the public informed about programs, policies and progress is essential to maintain citizen interest and involvement in the Chesapeake Bay cleanup effort.

An Informed Public

Keeping the public informed about programs, policies and progress is essential to maintain citizen interest and involvement in the Chesapeake Bay cleanup effort. Information and education on Bay efforts comes from many sources:

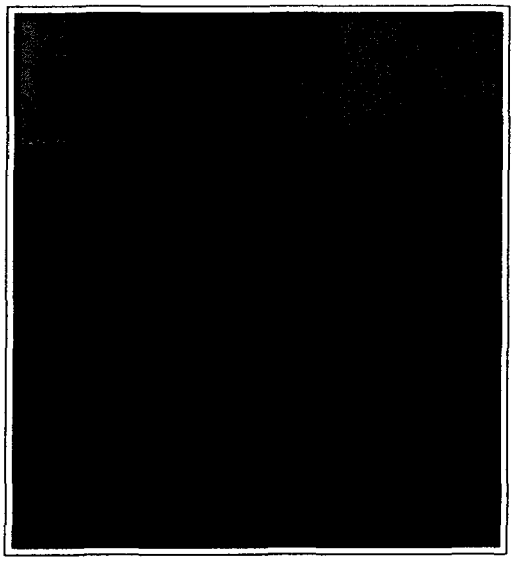
- The United States Environmental Protection Agency coordinates many baywide publications and publishes a monthly newsletter, the Bay Barometer.
- Virginia hosts an annual conference on environmental literacy. This conference is open to a variety of private and public sector officials throughout the commonwealth.
  - — Additionally, Bay Team Teachers in Virginia reach thousands of students every year.
- Maryland's extensive outreach and information efforts begin with its new Environmental Education By-law, which mandates instruction in environmental decision making in all grades and across all curriculums. This outreach program extends to a coordinated, statewide volunteer program, which planted over 1,400,000 trees last April and includes its "One Million Marylanders for the Bay" program.
  - — Marylanders have purchased over 150,000 special "Treasure the Chesapeake" license tags to raise over $1,600,000 for its Bay Trust.
- Pennsylvania's Bay Education Office promotes water quality initiatives through a year-round series of information, education and outreach projects, many aimed specifically at farmers.
- The District of Columbia and the Interstate Commission on the Potomac River sponsor a variety of projects and events to attract citizen involvement in the Potomac and Anacostia River restorations.
- The Chesapeake Bay Commission has developed many educational and informational programs.
- The Bay Journal, published by the Alliance for the Chesapeake Bay to provide timely information on program activities and other Bay-related news, is distributed monthly to 16,000 people.
- A score of newsletters from citizen groups, research institutions and watershed protection programs provide a wide array of specialized information important to the Bay's cleanup.

On the Horizon

The Chesapeake Bay Program will reach major milestones in the coming months as we look on the horizon.

One milestone will be the comprehensive reevaluation of the 40% nutrient reduction goal. The Bay Program will draw upon monitoring and modeling research findings and assessment of technologies and practices to address the four objectives of the 1991 reevaluation:

- Reevaluate the 40% nutrient reduction commitment based on available monitoring, modeling and research information.
- Refine nutrient reduction commitments as appropriate, based upon a careful evaluation of the cost effectiveness, implementation considerations, and living resources benefits.
- Provide a refined overall baywide nutrient reduction commitment including basin-specific nutrient reduction targets.
- Based on completed work and analysis, provide guidance to the signatories with regard to living resources, water quality and nutrient load characterization to revise the basin strategies most effectively.



An updated watershed model will add to our understanding of the Bay by simulating the discharge of pollutants throughout the watershed and their transport to the Bay. The model also will estimate the amount of nitrogen that reaches the Bay through atmospheric deposition (air pollution).

A new time-variable water quality model will provide estimates of how these pollutant discharges affect life-sustaining oxygen levels in the Bay. The water quality model will be linked to air program models to determine the effects of atmospheric nitrogen reductions that are anticipated by passage of the new Clean Air Act. The Bay Program is focusing on air monitoring as a full component of an integrated estuary program.

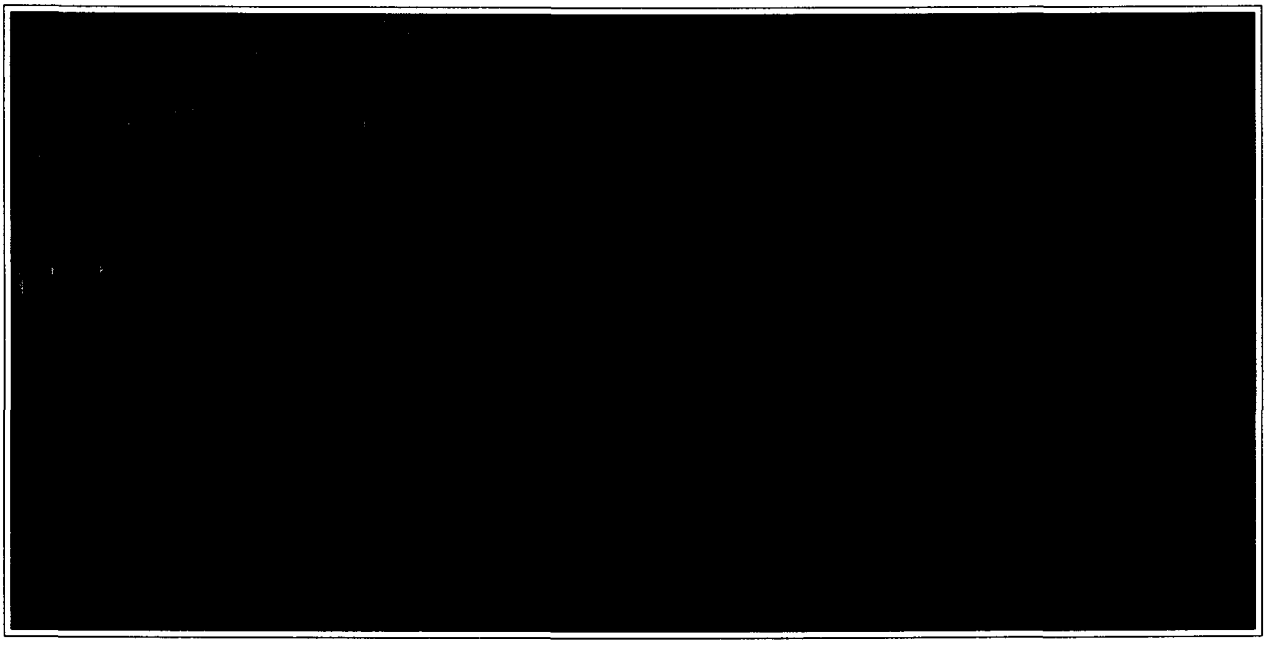
Beyond the studies, findings and research, we must continue to focus our energies on specific goals for the program. The living resources of the Chesapeake Bay need to remain a vital focus of our efforts. The following are actions that are underway or planned:

In the final analysis, the welfare of the Bay and its living resources depend on the will and determination of all the citizens of the region. Working together, sharing a common commitment to the future health and productivity of the Bay, we can succeed.

- Determine underwater grasses and dissolved oxygen goals
- Create a task force to manage exotic species such as Zebra Mussel
- Implement wetlands education
- Continue to develop ecologically valuable species management plans
- Set numeric goals for species restoration
- Improve living resource strategic planning
  — goal setting
  — public education
- Finalize Fishery Management Plans for
  — spot/croaker
  — summer flounder
  — american eels
- Alosid Fishery
  — evaluate results of studies
- Striped Bass Fishery
  — assess limited 1990 fishery
- Crab
  — implement measures to eliminate or minimize wasteful harvest practices
- Fish Passage
  — continue to provide access through the thousands of man-made obstructions to migrating fish
- Characterize the status of living resources in Bay tributaries
- Define necessary water quality conditions for survival of Bay resources

During 1992 we will reevaluate our toxics reduction strategies thereby adding to our information base for action. We must continue our efforts in pollution prevention. Statements of policy, creative ideas and methods of implementation must be developed as we move forward. As we have seen, the Bay belongs to all of us. One of our program goals is to expand participation among all groups of people in the Bay region, in order to increase awareness of environmental issues in local communities. We need to commit programs to recruit, educate and assimilate more people into the Bay partnership. Working together, we will all benefit.

As the years pass the Chesapeake Bay Program must continue to adapt and grow. Issues and challenges must be anticipated, and changes in policy need to reflect those issues and challenges. By making the Chesapeake Bay Program a dynamic, evolving program, we can best attain the original goals of the program — to view the Chesapeake Bay as one ecosystem and pledge our best efforts for its survival and restoration.



Acknowledgments

CHESAPEAKE EXECUTIVE COUNCIL

William K. Reilly, Chairman
Administrator of the U.S. EPA

William Donald Schaefer
Governor of Maryland

Robert P. Casey
Governor of Pennsylvania

Lawrence Douglas Wilder
Governor of Virginia

Sharon Pratt Dixon
Mayor of Washington D.C.

W. Tayloe Murphy
Chesapeake Bay Commission

PRINCIPALS STAFF COMMITTEE

U.S. Environmental Protection Agency
Edwin B. Erickson, Chairman
Administrator, Region III

Jon Capacasa, Acting Director
Chesapeake Bay Program Office

Virginia
The Honorable Elizabeth H. Haskell
Secretary of Natural Resources

Richard N. Burton, Executive Director
State Water Control Board

Keith Buttleman, Administrator
Council of the Environment

Pennsylvania
The Honorable Helen D. Wise
Chief of Staff for Programs
Secretary to the Cabinet

Patricia Buckley
Governor's Policy Office

Caren E. Glotfelty, Deputy Secretary
Water Management Department

Maryland
David Carroll, Chesapeake Bay Coordinator
Office of the Governor

The Honorable Torrey C. Brown, M.D.
Secretary, MD Dept. of Natural Resources

Verna E. Harrison, Assistant Secretary
MD. Dept. of Natural Resources

The Honorable Robert Perciasepe
Secretary of the Environment

Chesapeake Bay Commission
Ann Perisi Swanson
Executive Director

District of Columbia
Ferial Bishop, Administrator
Dept. of Housing & Environmental Regulation

Aubrey Edwards, Director
Dept. of Consumer & Regulatory Affairs

IMPLEMENTATION COMMITTEE

District of Columbia

James Collier
Dept. of Consumer & Regulatory Affairs

Kenneth Laden
Dept. of Public Works

Ferial Bishop
Dept. of Housing & Environmental Regulation

Maryland

Verna E. Harrison, Assistant Secretary
MD. Dept. of Natural Resources

The Honorable Robert Perciasepe
Secretary of the Environment

Rosemary Roswell
Dept. of Agriculture

Michael Haire
Dept. of the Environment

David Carroll
Office of the Governor

Pennsylvania

Patricia A. Buckley
Governor's Policy Office

Walter Peechatka
Dept. of Agriculture

Louis W. Berchini
Dept. of Environmental Resources

Keith R. Gentzler
Dept. of Environmental Resources

Paul O. Swartz
Dept. of Environmental Resources

Virginia

Richard N. Burton
State Water Control Board

Keith Buttleman
Council of the Environment

Roland Geddes
Division of Soil & Water Conservation

William A. Pruitt
Virginia Marine Resources Commission

Jack Raybourne
Dept. of Game & Inland Fisheries

Federal

Jon Capacasa, Chairman
Environmental Protection Agency Region III

Glenn Kinser
U.S. Fish and Wildlife Service

Kathy Bangert
U.S. Fish and Wildlife Service

Edmund Miller
U.S. Department of Defense

Jerry Stokes
USDA Forest Service

Dr. Robert Lippson
National Oceanic & Atmospheric Adm.

Robert Klumpe
USDA Conservation Service

Stanley Sauer
U.S. Geological Survey

Larry Lower
U.S. Army Corps of Engineers

Col. Frank Finch
U.S. Army Corps of Engineers

Regional

Robert Bielo
Susquehanna River Basin Commission

Lee Zeni
Interstate Commission on the Potomac

Ex Officio

Anna Long
Local Government Advisory Committee

Joseph A. Mihursky
Scientific and Technical Advisory Committee

Mary Roe Walkup
Citizen Advisory Committee

SPECIAL THANKS TO:

Photographs

Chesapeake Bay Foundation

Rick Brady

S. C. Delaney

Kent Mountford

Milton Tierney, Jr.

Cover Photo

Courtesy of Chesapeake Bay Program

Target Species Graphic

Lamar Platt
Maryland Department of Natural Resources

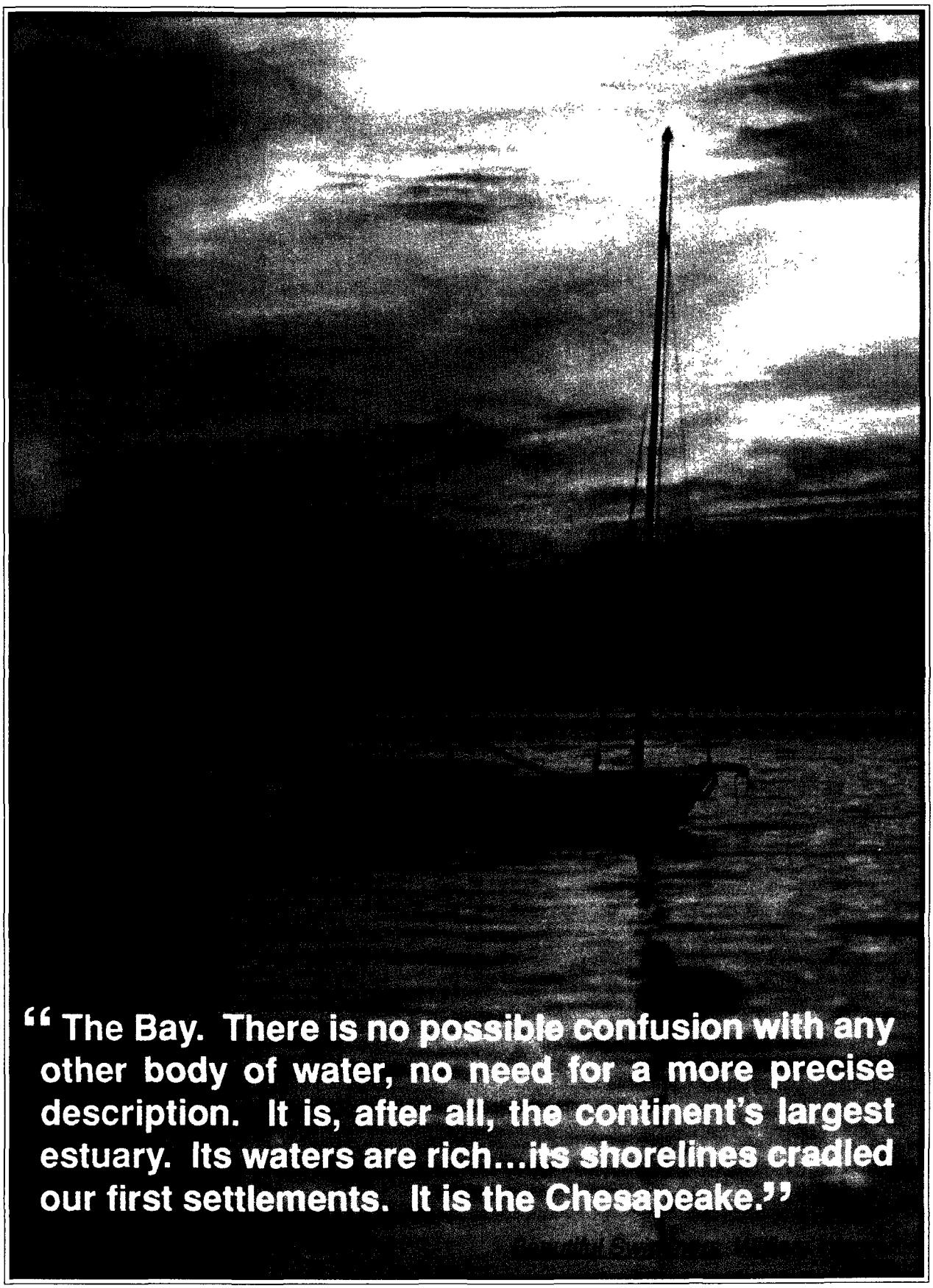
Layout & Design

Maggie Moulton

Editor

C. Thomas McCully

I wish to express my appreciation to all who took the time to offer information, comments and review of this document. I would especially like to thank Paul Schuette for his efforts. This progress report represents the best spirit of the Chesapeake Bay Program — working together for a common goal.



“The Bay. There is no possible confusion with any other body of water, no need for a more precise description. It is, after all, the continent’s largest estuary. Its waters are rich...its shorelines cradled our first settlements. It is the Chesapeake.”

This document was printed by the U.S. Environmental Protection Agency for the Chesapeake Bay Program.