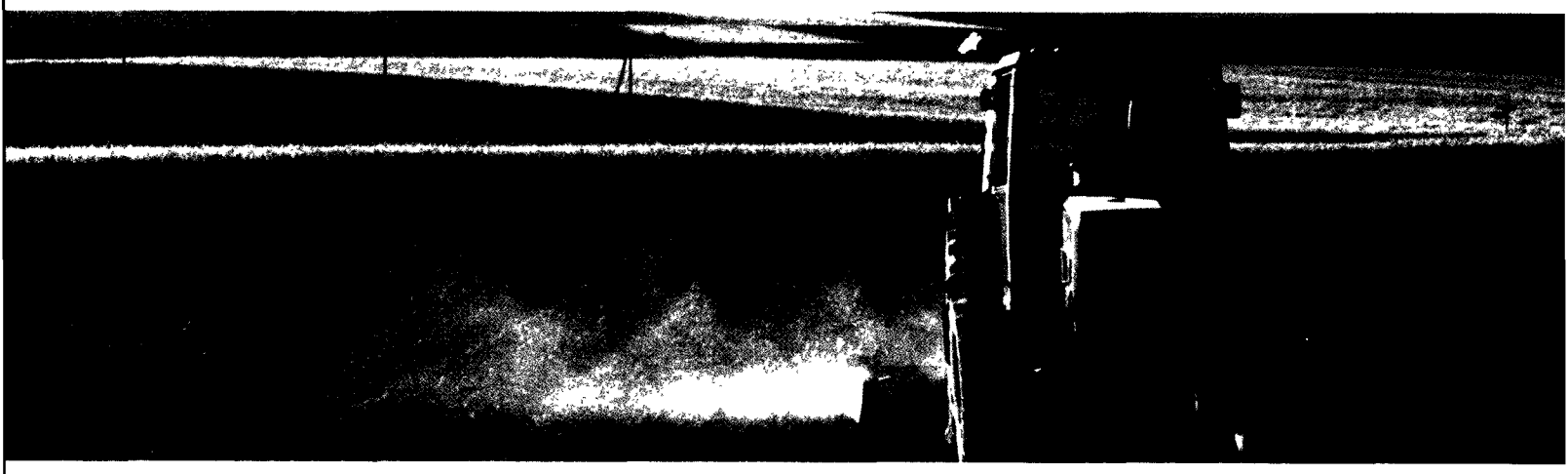
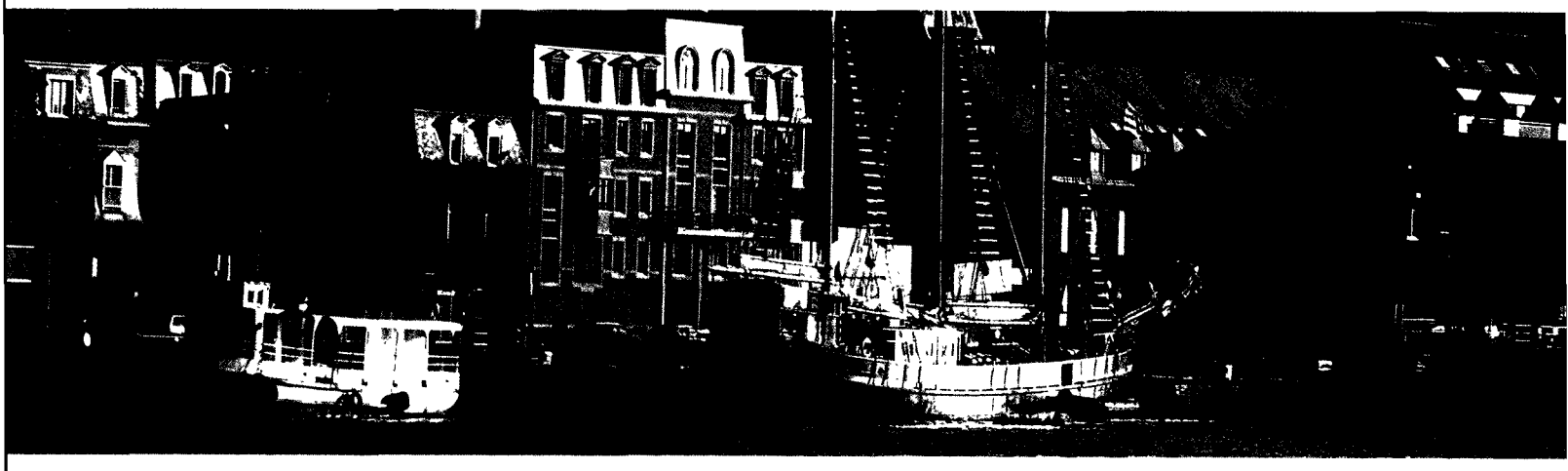
CBP/TRS 222/102
EPA 903-R-99-008

CHESAPEAKE BAY WATERSHED

ITS LAND AND PEOPLE





ENVIRONMENTAL INDICATORS

JUNE 1999

Chesapeake Bay Program

"When we see the *land* as a community to which we belong, we may begin to use it with *love* and *respect*."

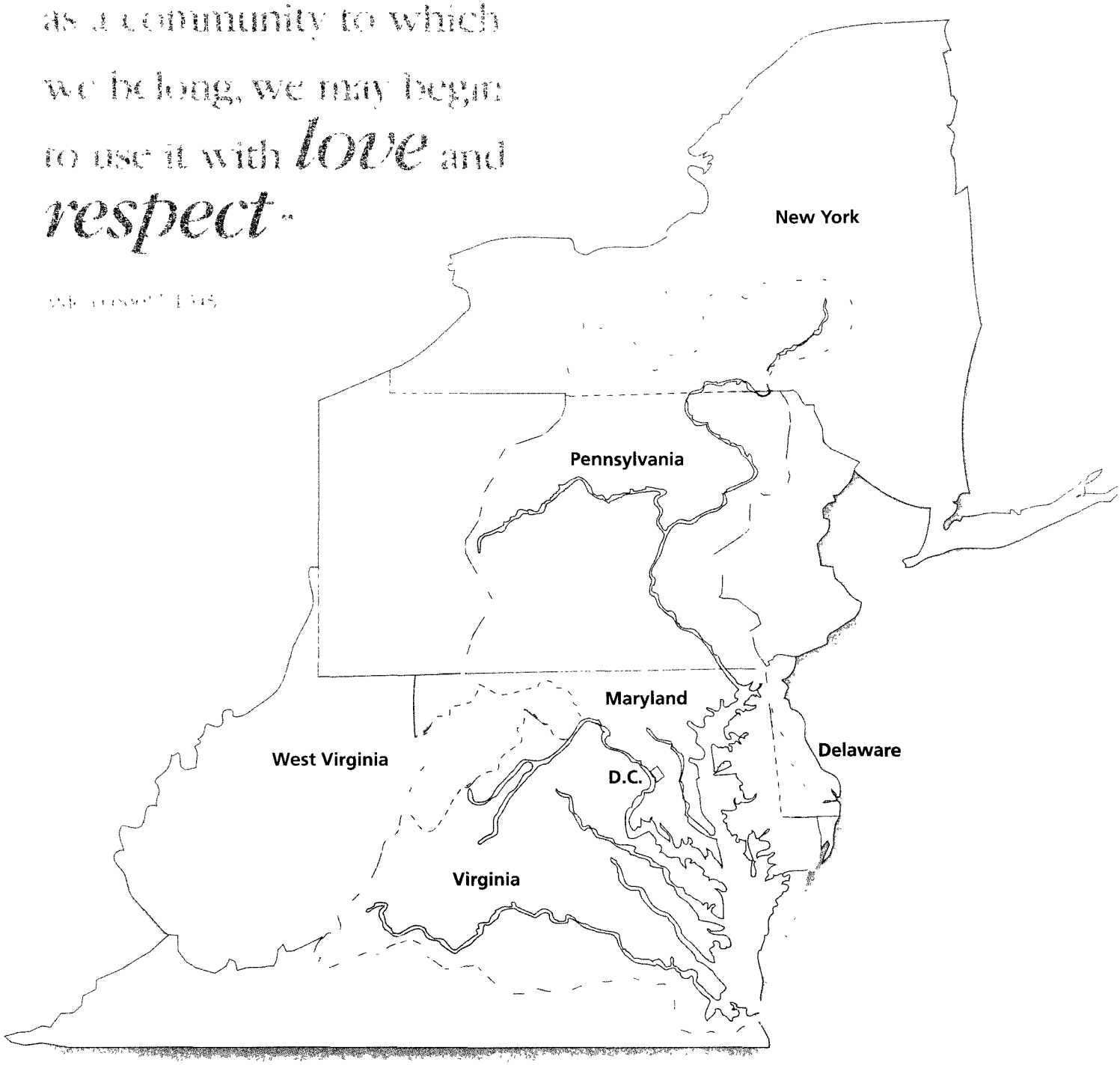


FIG. CHESAPEAKE BAY WATERSHED

The Chesapeake Bay is our country's largest and most productive estuary. Water from springs, streams, small creeks and rivers flows into the Bay, mixing with water from the Atlantic Ocean to form this estuarine system. From the smallest first order streams to the larger tributaries like the Susquehanna, Potomac and James Rivers, fresh water enters the Bay from a 64,000 square-mile drainage basin or watershed. The Chesapeake Watershed includes parts of New York, Pennsylvania, West Virginia, Delaware, Virginia and Maryland, and the entire District of Columbia.

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Abstract	The Chesapeake Bay was this nation's first estuary targeted for restoration and protection. The Chesapeake Bay Program is the unique regional partnership that has been directing and conducting the restoration of the Bay since the signing of the

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CHESAPEAKE BAY WATERSHED

ITS LAND AND PEOPLE

Soil, air, water, plants and animals, including humans, form a complex web of interdependencies that make up the Chesapeake Bay ecosystem. The physical processes that drive the Bay ecosystem sustain the many habitats and organisms found there. Even the smallest of creatures plays a vital role in the overall health of the Bay. Forests and wetlands throughout the Bay watershed filter sediments and pollutants while supporting birds, insects, mammals and fish. Small fish and crabs find shelter and food among lush beds of underwater grasses (submerged aquatic vegetation). Unnoticed by the naked eye, microplankton drift with the currents, providing food for larger plankton and small fish. Clams and oysters pump Bay water through their gills, filtering out both plankton and sediment. During the fall and winter, waterfowl by the thousands descend upon the Bay, feeding in wetlands and shallow waters. Bald eagles and ospreys, nesting high above the water, feed perch, menhaden and other small fish to their young. The range of aquatic environments, from freshwater to seawater, creates a unique ecosystem, abundant with life.

It is important to remember that humans are a prominent part of the Chesapeake Bay ecosystem. We are beginning to understand how our activities continue to threaten the Bay, its living resources and ultimately ourselves. The 15 million people living in the Chesapeake watershed play an important role in determining the future of the Bay and its resources. Each individual affects the Bay by adding waste, consuming resources and changing the character of the land, water and air that surround it. We must choose whether our role will be destructive or productive. Through the choices we make in our everyday lives, we can lessen our impact on the Bay's health. We must nurture what Aldo Leopold once called our "wild rootage" — a recognition of the fundamental connection and dependency between society and the environment. As advocates for the Bay and its many living resources, we can preserve the Chesapeake for generations to come.

The Chesapeake Bay was this nation's first estuary targeted for restoration and protection. In the late 1970s scientific research on the Bay pinpointed three areas requiring immediate attention: nutrient over-enrichment, dwindling underwater Bay grasses and toxic pollution. Once the initial research was completed, the Chesapeake Bay Program evolved as an institution dedicated to restoring this exceptionally valuable resource.

The Chesapeake Bay Program is the unique regional partnership that has been directing and conducting the restoration of the Bay since the signing of the historic *1983 Chesapeake Bay Agreement.* The Chesapeake Bay Program partners include the states of Maryland, Pennsylvania and Virginia; the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; the U.S. Environmental Protection Agency, representing the federal government; and participating advisory groups. Since its inception in 1983, the Chesapeake Bay Program's highest priority has been the restoration of the Bay's living resources: its finfish, shellfish, underwater grasses and other aquatic life and wildlife.

Threats to the Bay

Major threats to the Bay include nutrients, toxic chemicals, habitat loss and overfishing. Although nutrients, sediments and potentially toxic chemicals do occur naturally in the Chesapeake Bay system, the amount of these pollutants entering the system has been amplified by human activities. Though sediments and toxic chemicals cause harmful effects to the ecosystem, most scientists believe excess nutrients have the largest impact on the Bay.

A. Nutrients

"Eutrophication," or nutrient enrichment, of a body of water can lead to large algal blooms. Algal blooms are the result of the rapid, uncontrolled growth of microscopic plants in Bay waters. They harm the system in two ways. First, they cloud the water and block sunlight, causing underwater grasses to die. Underwater grasses, like all plants, cannot grow without sunlight. Because these grasses provide food and shelter for Bay creatures, spawning and nursery habitat is destroyed and waterfowl have less food to eat when grasses die off. Second, when the algae die and decompose, oxygen is used up. Dissolved oxygen in the water is essential to most organisms living in the water, such as fish, crabs and other shellfish. In the summer, dissolved oxygen levels can become dangerously low in the deeper waters of the Bay. As upper water temperatures rise, fish and crabs that would normally retreat to deeper, cooler waters may be restricted to the warmer upper waters due to low oxygen in deeper waters. This imposes a stress on these organisms which can lead to their mortality.

B. Toxic Chemicals

Chemical contaminants are also a threat to the health of the Bay, particularly when they are found in high concentrations. Filter feeding organisms like clams, mussels and oysters can accumulate these chemicals, as can fish and other marine organisms. An accumulation of chemical contaminants in any organism may cause its death or reduce its reproductive success. It can also pose a health threat if the organism is eaten by other animals, including humans. One of the most notorious environmental chemical contaminants stories is that of the pesticide DDT and its impact on bald eagles. DDT contamination caused eggshell brittleness, and fewer young were hatched. Due in part to a ban on DDT, bald eagles are no longer endangered and are seen with increasing frequency around the Bay watershed. A loss of habitat is now the primary concern regarding the future of our nation's symbol.

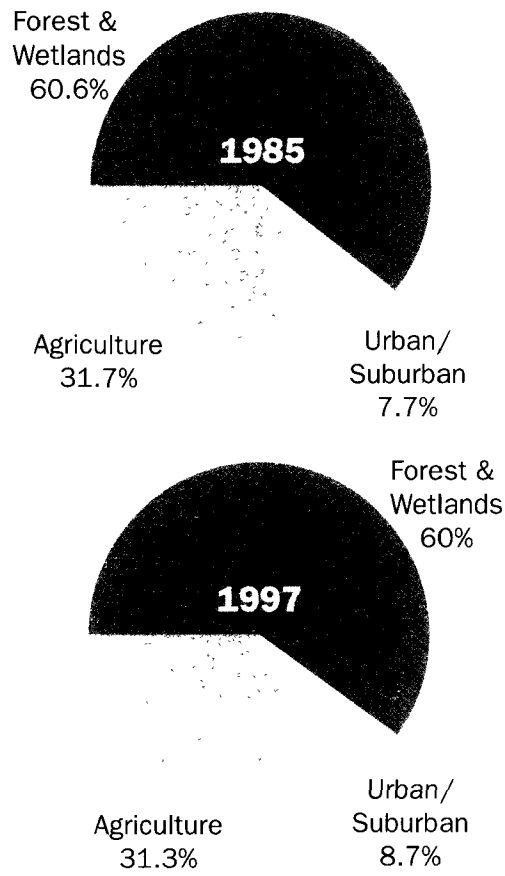
C. Habitat Loss

The Bay and its watershed provide food, water, cover and nesting/nursing areas, collectively known as habitat, to more than 3,000 plants, fish and waterfowl. A loss of habitat poses a threat not only to the organisms that live in that habitat, but to the overall health of the Bay.

Forests: Forests contribute to the Bay's health in a variety of ways: they filter nutrients and sediment, capture rainfall and regulate streamflow, moderate stream and air temperatures, stabilize erodible soils and preserve biodiversity by creating and maintaining critical wildlife habitat. Historically forest lands have been cleared for farming, fuel and timber, especially during colonial years. Today the demands of an increasing population are the primary threat to forest lands. The amount of forest land needed to restore the ecological balance of the Bay is unknown. To maintain the present health of the Chesapeake ecosystem and improve it in the future, new forests must be planted and existing ones must be conserved, especially critical forests along streambanks and those buffering polluting lands.

Although forest and wetlands still cover a majority of the Chesapeake Bay watershed, they are being lost at an alarming rate. We've lost hundreds of thousands of acres of forest land in the Bay region between 1985 and 1997 primarily due to urban sprawl. Forests, once covering 95% of the watershed, now cover around only 60%. Areas closest to the Bay are losing forest the fastest. A recent EPA study indicates that coastal watersheds have the highest fragmentation. Forest fragmentation is the process by which larger contiguous forest lands are broken into smaller, more isolated fragments or islands, surrounded by human-modified environments like agriculture and urban land uses. There is concern that a continued decline in and fragmentation of forest land may reduce the ecosystem's ability to protect water quality, provide healthy and diverse habitat, and remain a viable economic resource for recreation, timber and other forest products.

Wetlands perform many of the same functions as forests and are as important to maintaining the health of the Bay ecosystem. Wetlands are areas that are subject to periodic flooding or prolonged saturation. In the Bay watershed we have both tidal (subject to flooding from daily tides) and non-tidal wetlands. Wetlands are among the most productive ecosystems in the world and support an enormous amount of plant material. As such, they have the ability to trap sediment, store seasonal flood waters and absorb pollutants like nitrogen and phosphorous. Coastal wetlands absorb the destructive energy of waves, reducing erosion. Wetlands also provide valuable habitat for many organisms like the great flocks of migratory waterfowl that winter in tidal wetlands. Other wildlife, including muskrats, beaver, otter, songbirds and wading birds, also rely on wetland habitat. An estimated two-thirds of the entire nation's commercial fish and shellfish stocks depend on wetlands as nursery or spawning grounds.



Chesapeake Basin Land Use

Between 1985 and 1997 we lost 264,000 acres of forest and wetlands, 158,000 acres of agriculture land, and gained 413,000 acres of urban suburban land.

Often viewed as wastelands, wetlands were historically drained or filled for farms, residential developments, commercial buildings, highways and roads. Approximately 1.7 million acres of wetlands remain in the Bay watershed. This is less than half of the wetlands that were here during colonial times. We are still losing estuarine wetlands, like tidal marshes, but loss rates are down from 547 acres lost per year between the 1950s and 1970s to five acres lost per year during the 1980s due to state and federal wetland regulations. Unfortunately, the same cannot be said for freshwater wetlands such as forested swamps. Between the 1950s and 1970s the rate of loss was roughly 2,400 acres per year. During the 1980s the rate of loss jumped to 2,800 acres per year.

Sources of Pollutants

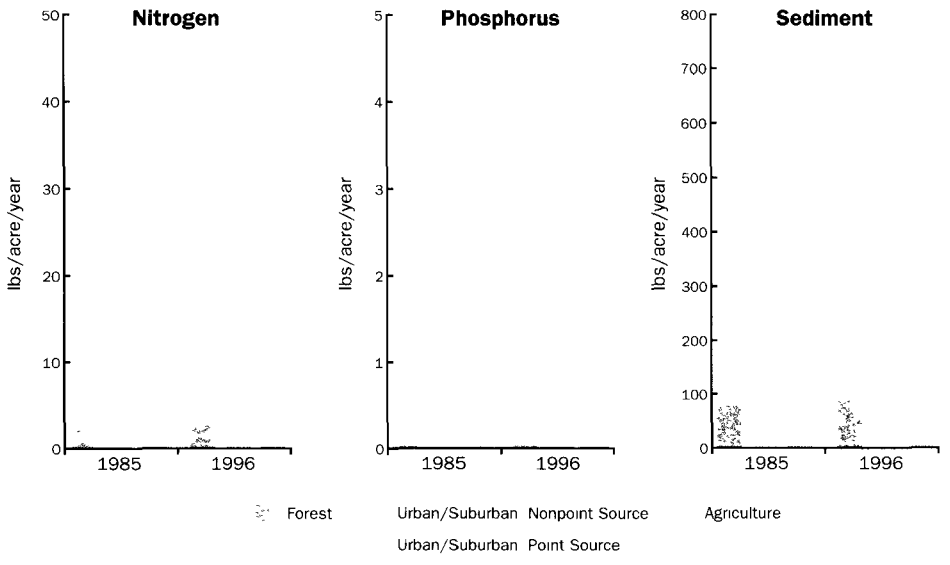
Nutrient, sediment and toxic pollution enters the Bay from two major sources: point sources and nonpoint sources. A point source is a site where pollutants enter the waterways from a specific location. Industrial and waste water treatment facilities are examples of point sources. It is important to note that point sources are usually regulated.

Nonpoint source pollution is delivered from broad areas of the watershed, rather than from one specific point, which makes these sources very difficult to control. For example, stormwater picks up pollutants as it flows over parking lots and roofs, through a suburban development, over an eroding streambank, through a farm field and into the river. Nonpoint source pollution includes runoff from farmland, lawns, roads, parking lots and other paved areas. Your car, yard, lawnmower — all of these contribute to nonpoint source pollution in the Bay system. Another source of nonpoint pollution is atmospheric deposition, which occurs when pollutants enter the air and then fall onto the land. Major sources of pollutants entering the air include fossil fuel power plant smokestacks and automobile tailpipes.

Trends in Pollutant Loads from Various Land Uses

The graph below shows sediment and point and nonpoint source nutrient load trends for various land uses. Pollutant loads from agricultural and urban/suburban lands have generally declined due to management actions. Two key factors affect the overall pollutant loads delivered to the Bay: the pollutant load generated by a land use and the number of acres of that land use. Forest lands generate significantly fewer pollutants per acre than other land uses; however, since they are the largest land use in the watershed, their overall contribution is a significant source of pollutants to the Bay. Agricultural land covers less acreage than forest land, but since the pollutant loads per acre are higher, it ends up being the largest contributor of pollutant loads to the Bay. On a pound-per-acre basis, taking into account both point and nonpoint sources, urban/suburban areas are the biggest culprits in delivering nutrient pollution to the Bay. However, since they make up a relatively small portion of the total watershed area, the total loads delivered to the Bay are smaller than those delivered by agricultural land. As we continue to develop more of the watershed, we expect these loads to increase unless appropriate management action is taken.

Trends in Nutrient and Sediment Loads by Land Use



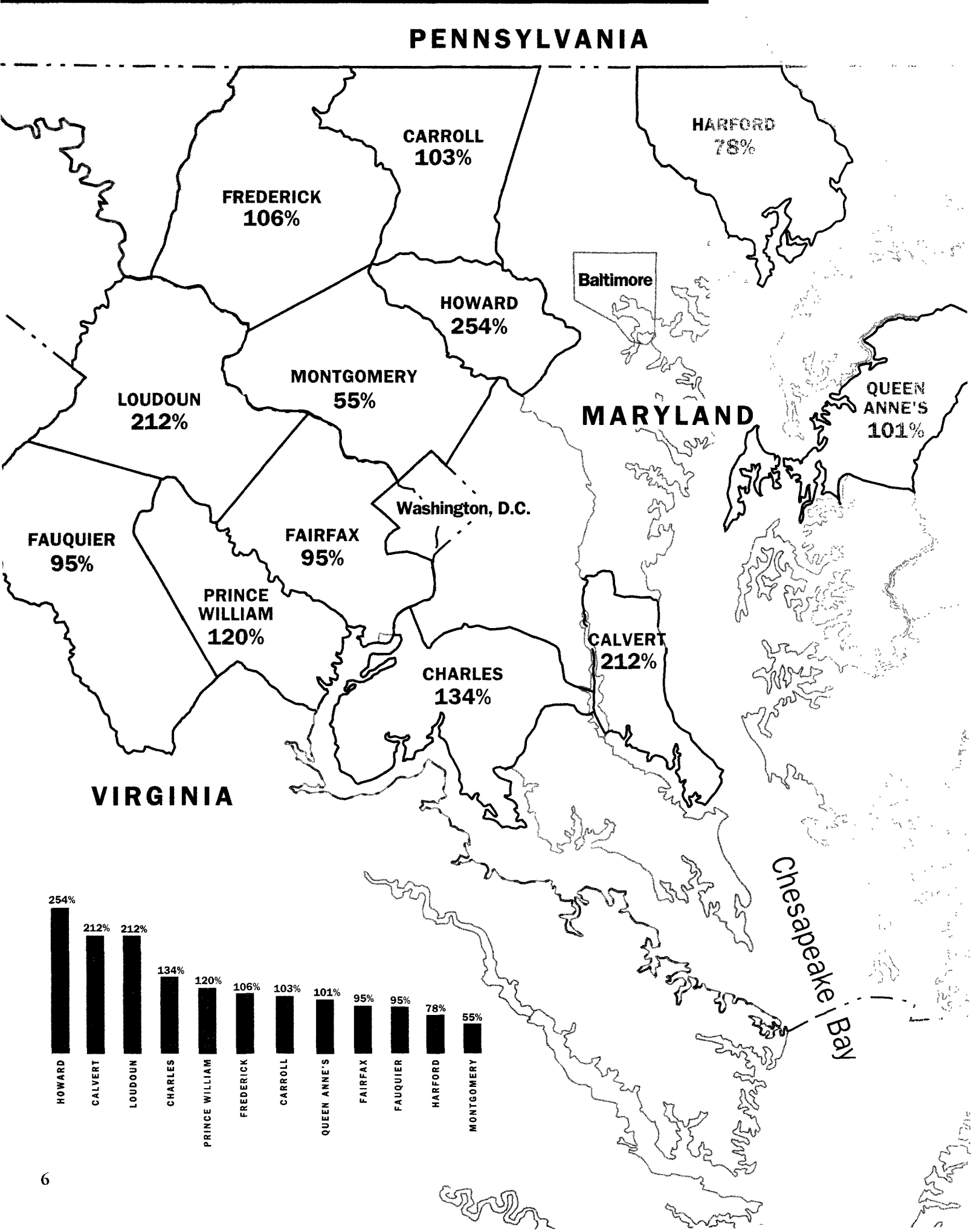
Trends in Population & Development

Population in the Chesapeake Bay watershed has steadily increased since the 1950s. By the year 2020, this area is expected to be home to 17.8 million people, almost three million more than the present 15 million. Regional development trends have changed during the 20th century in a manner that is impacting the Bay. In the 19th and early 20th centuries, compact urban areas, such as towns and cities surrounded by farms and forests, were the dominant development pattern of the Bay region. After World War II this pattern began to change as the car facilitated the development of more suburban areas. Suburban development patterns have increasingly become low-density and single-use (separate from other community needs such as business, schools, jobs, etc.). These recent development patterns (characterized as "sprawl") result in an increase of impervious surfaces such as roads, parking lots and rooftops. With each rain, runoff picks up pollutants from impervious surfaces that drain into rivers and eventually into the Bay, degrading water quality and ultimately the Bay's living resources.

Sprawl development tends to consume valuable resource land such as farmlands, wetlands and forests. These resource lands were consumed at a rate of roughly 35,000 acres per year from 1985-1997. Between 1985 and 1997, we lost 264,000 acres of forest and wetlands and 158,000 acres of agricultural land, and gained 413,000 acres of urban/suburban land. According to the Society of American Foresters National Office, a total of 1.7 million new homes are projected to be built in the watershed from 1998 to 2020, potentially consuming more than 600,000 additional acres of forest and farmland. According to the American Farmland Trust, large portions of two of the top-ten most threatened agricultural regions in the United States are located in the Chesapeake Bay watershed: the northern Piedmont (Maryland, Pennsylvania, Virginia) and the mid-Atlantic coastal plain (Maryland and Delaware). Farmland provides economic value to a region. Maryland, Virginia and Pennsylvania rank among the top-ten producing U.S. states per acre of farmland.

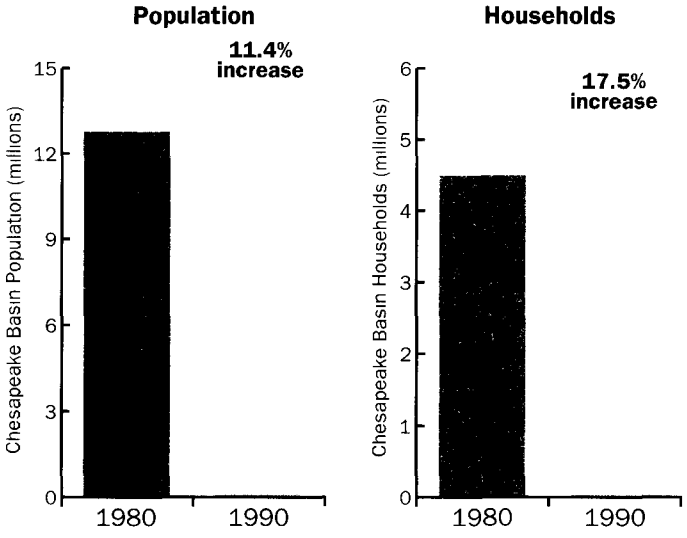
From 1970 to 1995 several suburban areas of the watershed experienced explosions in their population. In the Baltimore and Washington, D.C. metropolitan area the outer ring suburbs such as Loudoun and Calvert counties are growing the fastest. South central Pennsylvania has begun to feel the northward push of suburban development from Baltimore and Washington, D.C., as is evidenced by the 33% increase in population in York County and the 48% increase in Adams County from 1970 to 1995. Coupled with the increase in population in suburban metropolitan areas is the ex-migration of people from cities. There was a 24% decrease in population in Baltimore City and a 27% decrease in population in Washington, D.C. from 1970 to 1995. Due to "urban flight", Baltimore County closed more than 60 schools, only to build the same number in outlying areas at a cost of $500 million over 20 years.

Population Increases from 1970-1995



With an increase in population, there is a corresponding need for an increase in development. However, development in Maryland increased by 47% between 1973 and 1990, a rate of more than twice the 22% increase in population for those years. Based on these findings, land is being consumed at a rate that far outpaces the increase in population.

Population, Number of Households and Density: Based on the 1980 and 1990 census, the population in the Chesapeake watershed increased by 11.4%. However, at the same time, the number of households increased by 17.5%. The number of new households has increased at a higher rate than population due to a reduction in household size (fewer people per household) between 1980 and 1990. In Maryland, it has been determined that the average lot size per household has also increased. An increase in household numbers coupled with increasing lot sizes results in land being consumed at an even faster rate than population increases. From 1973 to 1990, Maryland residential development increased 47%. Low density (greater than one acre per parcel) residential development comprised 79% of that increase.

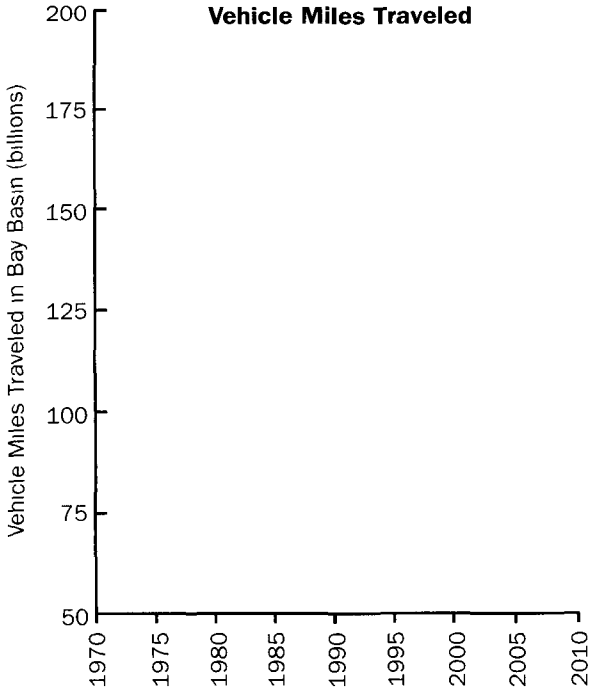


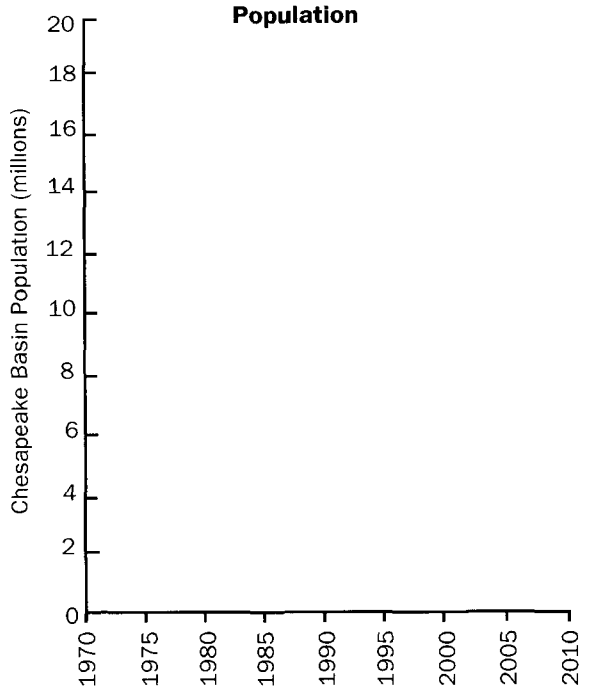
Recent studies have shown that low density sprawl development results in an increase in infrastructure costs. Infrastructure costs include the capital costs for streets, sewer, water, storm drainage and schools, and they are passed on to the taxpayer. Significant savings to local government and citizens can be made when housing is higher in density and growth occurs in areas where infrastructure currently exists rather than in outlying rural areas.

Current patterns of land use and resource consumption threaten to undermine 25 years of environmental progress. We are offsetting air pollution gains, offsetting water pollution gains, increasing flooding potential and losing more forests, farmlands, wetlands and sensitive ecosystems.

Population and Vehicle Miles Traveled: Low density, single-use development increases traffic congestion and airborne sources of pollution entering the Bay. These development densities are often too low to support mass transit. The car is often the only means of transportation to work, school and shopping areas. Between 1970 and 1997, vehicle miles traveled increased at four times the rate of population in the Bay region. Vehicle miles traveled are expected to increase at a rate of three times the population by the year 2010. Pollution from car exhaust harms the Bay. It also contributes to increases in ground level ozone, which is a human health hazard. Clean car technologies like emission controls, the use of reformulated gasoline and the implementation of other mobile source emission rules have buffered the impact of increased travel. However, the benefit of these technologies and regulations could be greatly enhanced by reductions in the amount people drive every day. This means living closer to where we work, shop and go to school.

The dependence of Americans on their cars is an interesting story in itself. The average person in the mid-Atlantic region spends almost one out of every five dollars buying or maintaining their automobile(s). For the mid-Atlantic region, the number of vehicles on the road has risen from



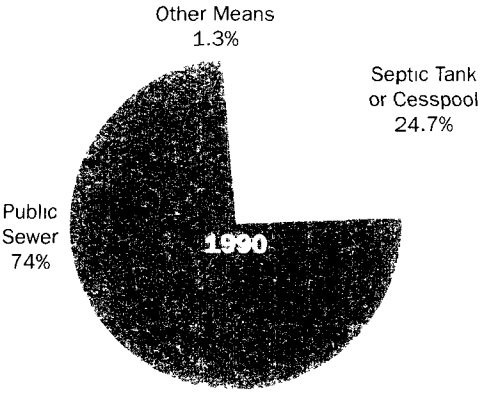


roughly 11.5 million to 19 million from 1970 to 1995. Not only are there more cars on the road, but the amount of people who drive alone to work is increasing. There are four times as many single drivers as there are carpools. There are eight times as many single drivers as there are people who use public transportation. Public transit use has also decreased in the last decade.

People are spending more time commuting in their cars as development spreads further from central work areas. One of the greatest stressors people report is the time they spend away from their families while commuting to work. All of these scenarios add up to more congestion on our roads. The average speed on the D.C. Beltway decreased from 44 mph to 23 mph during a seven-year period. A study by the Texas Transportation Institute estimates that the average commuter in Washington, D.C. spends the equivalent of three full days a year in the car due to road congestion. It also states that road congestion cost the nation $53 billion in wasted time and fuel in 1994. These trends will worsen if current development patterns persist.

Households and Septic/Sewer Use:

According to the 1990 Bureau of the Census data, 24.7% of housing units (roughly 5.7 million) in the Chesapeake Bay watershed rely on septic tanks or cesspools to treat their household wastewater. For the most part, septic systems do not incorporate technologies to remove nitrogen from the wastewater they discharge. Nitrogen released from septic systems leaches into the groundwater which makes its way into local waterways and eventually the Bay. Although there are alternative septic systems that do remove nitrogen from wastewater, they are very expensive. Population in the watershed is expected to increase by 18% between 1997 and the year 2020. Even if the percentage of septic use (relative to public sewer use) remains the same, we expect the nitrogen loads from septic systems to increase as population increases. Overall, total nitrogen loads to the Bay in 1985 were approximately 359 million pounds. Of that load, around 10 million pounds of nitrogen were from septic systems. Projections indicate nitrogen loadings from septic system use will be 13 million pounds per year by the year 2020. If the percentage of the population using septic systems increases relative to the population using public sewer, the projected loads from septic tanks will be even higher than current projections.



Innovations at wastewater treatment plants have been successful in reducing nitrogen discharges. Biological Nutrient Removal (BNR) is a wastewater treatment technology that removes nutrients from wastewater as well as the organic content; whereas conventional wastewater treatment only removes organic material. In 1998 31% of the basin's wastewater from wastewater treatment plants was treated using BNR with excellent results. Should the percentage of the population using septic increase as predicted, the benefits of nitrogen load reduction from investments in new technologies at *existing* public wastewater facilities may not be maximized.

The most important water quality goal set by the Chesapeake Bay Program was the 1987 goal of a 40% reduction of the controllable loads of nitrogen and phosphorus entering the Bay between 1985 and the year 2000. In 1992 the Chesapeake Bay Program agreed to maintain the reduced nutrient loading levels beyond 2000. This continues to be a huge challenge considering population growth in the region. In addition to the 40% nutrient reduction goal, the Chesapeake Bay Program has been instrumental in working with its state and federal partners to restore the Bay in other ways. There are a variety of policies and programs aimed at reducing the impacts from land upon the Bay.

The Priorities for Action for Land, Growth and Stewardship.

By the year 2020 the region is expected to become home to almost 18 million people. Growth pressures will continue to test our ability to meet Chesapeake Bay restoration goals. Both new and longtime residents of the region will want to attain economic prosperity, will expect to live in communities where the quality of life is high, and will insist on an environment that is clean and available for their enjoyment. Alternatives to sprawl development that include protection of sensitive areas are essential to improve quality of life and restore the health of the Bay. Solutions, such as efficient development patterns, protecting natural areas and traditional uses of land (farming and forestry), improve the local tax base as they require less government services such as roads and sewer. They also enhance quality of life by providing open space and conserving those historic and cultural resources that are so much a part of community identity.

Adopted in 1996, the Chesapeake Bay Program's *Priorities for Action for Land, Growth and Stewardship* represents a beginning in meeting this challenge in a manner that is sensitive to local issues and autonomy and emphasizes the desire to help communities help themselves. The *Priorities for Action* can be viewed as a framework to address land, growth and stewardship issues in the Bay region. These priorities are voluntary actions that will be accomplished through a variety of public and private partners, including — but not limited to — the Chesapeake Bay Program. The goal of the *Priorities for Action* is: **"To encourage sustainable development patterns that integrate economic health, resource protection and community participation."**

This approach recognizes that communities are the basic unit for addressing growth, and all factors should be considered — the economy, the quality of life and sense of place in local communities, and the long-term stewardship of the natural environment. A variety of stakeholders play a direct role in land stewardship issues. The *Priorities for Action* seeks to increase communication and dialogue with and among stakeholders, such as local and regional government representatives, land developers, realtors, businesses, non-profit and civic organization leaders, homeowners and interested citizens. Meeting the goals of the *Priorities for Action* will be a challenge for us all.

Tributary Strategies:

A key to the successful reduction of nutrients regionally has been the effort by the Bay Program partners to put tributary strategies in place. In 1992 the Chesapeake Bay Program partners agreed to address nutrients at their source: upstream in the Bay's tributaries. As a result, Pennsylvania, Maryland, Virginia and the District of Columbia began developing tributary strategies for the ten major tributary basins to achieve specific nutrient reduction targets. Where strategies are not yet in place, there are statutory deadlines to complete them and to set appropriate goals.

Riparian Forest Buffer Initiative:
Forests along waterways, known as "riparian forests" and other vegetated buffers serve as a trap for nutrients and sediment from upland sites. Maryland, Pennsylvania, Virginia, the District of Columbia and federal facilities are implementing a Riparian Forest Buffer Initiative to achieve the targets established in their tributary strategies. The biggest commitment of the Riparian Forest Buffer Initiative is to restore riparian forests on 2,010 miles of stream and shoreline in the watershed by 2010. Implementation of the initiative has been under way since 1996 with hundreds of new miles of riparian forest planted in the watershed. In addition, a public-private partnership with American Forests called, "Global ReLeaf for the Chesapeake Bay" is raising private funds to plant more than 1 million trees by the year 2000. Numerous local governments have taken action to protect stream corridors through planning and zoning guidance, new incentives such as the Conservation Reserve Enhancement Program for agricultural landowners and tax relief. Easement programs have begun to accelerate accomplishment of Bay Program goals.

The Community Watershed Initiative:
Citizens of the Bay watershed often make a connection to the Bay on a small scale — through their neighborhoods, communities and the local environment surrounding them. It is also at this level that decisions are made every day which affect land use, infrastructure, water quality and the environment. Depending upon the decisions made, these actions will either systematically advance efforts to protect the health of the Bay or incrementally impair the Bay Program's ability to achieve watershed-wide restoration objectives. The Community Watershed Initiative seeks to address three key needs at the community watershed level in order to promote watershed protection and restoration: strengthening the partnerships among the Chesapeake Bay Program partners, local governments and community members; improving access to information and technical and financial assistance that assist community watershed efforts; and building organizations and improving organizational skills at the community watershed level. By serving as a catalyst and a resource, the Chesapeake Bay Program can assist in the development, growth and success of local community watershed efforts.

If we want a clean, healthy Bay
that can sustain biological diversity and be economically stable, we must identify, alter and, if possible, eliminate our own individual actions that impact the Bay. People alter ecosystems. The solutions to problems threatening the Bay lie in the lifestyles we choose. The Bay ecosystem is an interconnected whole where forests are linked to oyster reefs, housing developments to Bay grasses, and choices to responsibility. ***Education is key.*** Informed people make decisions that are beneficial to themselves, their culture, their community and the Chesapeake Bay.

The *Priorities for Action*

for Land, Growth and Stewardship

Goal: *"To encourage sustainable development patterns that integrate economic health, resource protection and community participation."*

I. Foster a Sense of Community and Place to Promote Heritage

The Chesapeake Bay Region's heritage is a composite of its landscape, people, institutions and history. The special character, communities and sense of place are important qualities to residents and a motivation for local protection and restoration efforts.

II. Revitalize Existing Communities

Increasing the vitality of existing communities will influence development patterns in the countryside. Revitalization efforts will assist existing communities and help reduce sprawl development.

III. Encourage Efficient Development Patterns

Efficient development patterns encourage higher density, compact, contiguous, transit-oriented and mixed-use development which is ecologically sound. Benefits to the Bay include improved quality of life in our communities, reduced impervious surfaces, conservation of farms, forest lands, natural areas and reduced reliance on automobiles.

IV. Promote Economic Viability

Communities are recognizing the linkage between economic vitality, environmental protection and a community's social fabric. Economies within the region will need to be designed to create opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations.

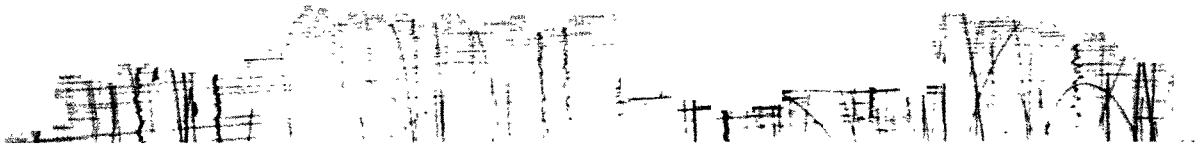
V. Foster Resource Protection and Land Stewardship

Many public and private landowners and users of Bay resources act as "stewards" of their share of the Chesapeake region, working to protect characteristics of the land and water while enjoying social and economic benefits.

VI. Develop a Database for Land Growth and Stewardship Issues, Track Progress Toward Goals and Provide Technical Assistance

Environmental indicators are a way to evaluate progress of land, growth and stewardship efforts. They also can inform and involve the public in achieving Chesapeake Bay Program goals.

The Chesapeake Bay Program identifies growth and land use issues of a Baywide nature, addresses development topics and forges alliances with other organizations and interests to: 1) Promote sound land management decisions; 2) provide growth projections and assess the impacts of existing growth on the Bay and its tributaries; and 3) encourage public and private actions to reduce the impacts of growth.



Priorities for Action for Land, Growth and Stewardship in the Chesapeake Bay Region
CBP/TRS 152/96

Beyond Sprawl: Land Management Techniques to Protect the Chesapeake Bay
CBP/TRS 190/97

Who Pays for Sprawl? The Economic, Social, and Environmental Impacts of Sprawl Development, A Literature Review
CBP/TRS 203/98

For more information please call
the Land, Growth and Stewardship Subcommittee at 1-800-YOUR-BAY