



Vital Signs

Assessing the State of Chesapeake Agriculture in 2005



CHESAPEAKE BAY FOUNDATION
Save the Bay

EXECUTIVE SUMMARY

The Chesapeake Bay Foundation (CBF) is pleased to present *Vital Signs—Assessing the State of Chesapeake Agriculture in 2005*.

Often, people give little thought to their connection to agriculture, much less to food production and the people who produce it. The fact is, however, that agriculture plays critical and diverse roles in Maryland, Virginia, and Pennsylvania—the three states comprising most of the 64,000 square mile Chesapeake Bay watershed.

For this reason, CBF, working with numerous farm experts, has identified twelve indicators, or “vital signs,” in three categories—**Community, Economics, and Environment**—that we believe measure the health of Chesapeake agriculture in 2005. Wherever possible, we tracked indicators back to 1950. While the data presented in this report are factual, the ratings are subjective and reflect the collective perspectives of the project team.

Our conclusions are:

Community. Haphazard suburban development continues to consume some of the area’s best farmland at alarming rates. Fewer farmers work the land, and young people are not entering the profession fast enough to replace retirees. Fewer and fewer farms produce the bulk of the region’s food—a trend that increases short-term production efficiencies but decreases community benefits.

Economics. Farmers currently receive a lower percentage of consumers’ food spending than in the past. The average farm family needs off-farm employment to



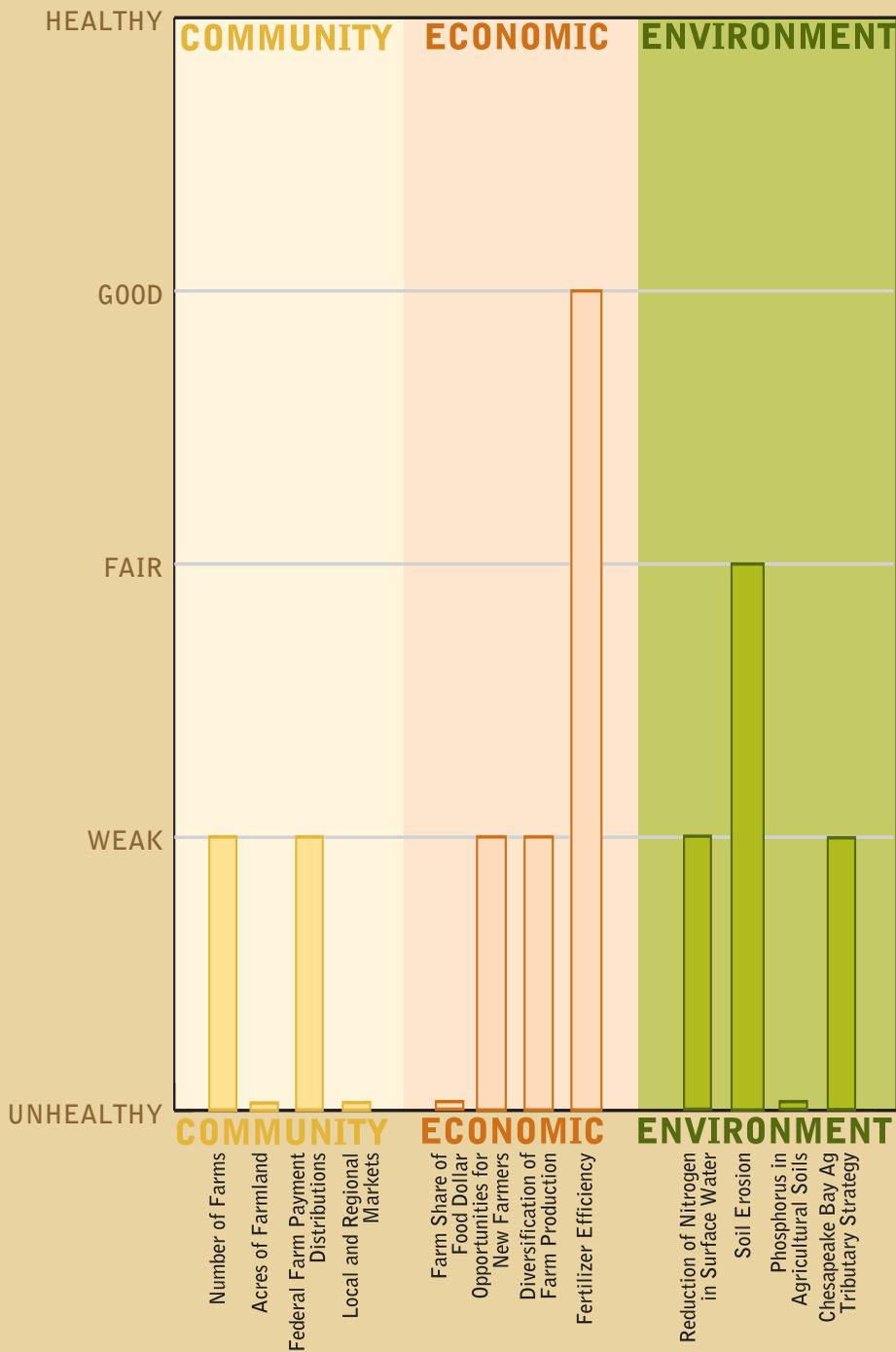
Family Farm, MD

Natural Resources Conservation Service

survive economically, with 90 percent of farm families’ incomes coming from off-the-farm work. On the positive side, farmers are using less fertilizer more efficiently, leading to savings on costly fertilizers and reducing nutrient losses to the environment. Other costs, especially of land and equipment, have increased dramatically, making it very difficult to enter farming. Financial assistance, from state and federal governments, is inadequate to stabilize farm income or enhance environmental practices.

Environment. Regional farmers have been leaders in reducing soil erosion, but erosion rates are still higher than the national average and more than is tolerable to maintain farm productivity and protect our waterways. Farmers have done much to help reduce pollution from farms, but more needs to be done soon. Nitrogen pollution from agriculture has decreased but not enough to achieve the pollution reduction goals set by the Bay states through their Chesapeake Bay Tributary Strategies. Farmers have improved their management of phosphorus, but high concentrations of livestock and poultry in some regions overwhelm the land base with excess amounts of manure, making phosphorus

STATE OF CHESAPEAKE AGRICULTURE SUMMARY



pollution control still insufficient.

Throughout the report, we note that in 2005 both agriculture and the Chesapeake Bay, including its rivers, are nowhere near as healthy as they need to be. There are—right now—opportunities for significant progress. CBF believes that we must:

- Build on past commitments to protect farmland and concentrate this protection on “prime farmland;”
- Ensure that the Bay region farmers get an equitable share of federal Farm Bill payments, and direct increased levels of federal and state government payments to support the conservation practices that are outlined in the Chesapeake Bay Tributary Strategies;
- Increase the economic viability of farming by (i) promoting direct sales to increase farmers’ share of food dollars, (ii) looking for other ways to enhance farm income, and (iii) creating incentives for farmers to adopt more conservation practices;
- Invest in new technologies to reduce nitrogen and phosphorus pollution, and develop alternative uses of excess animal manure; and
- Increase state and federal funding for conservation practices.



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No-till planting of corn into cover crop of barley, Washington County, VA.



CD Dollar

Family Farm, Washington County, MD

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Special thanks go to our project leaders:

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INTRODUCTION

Agriculture is critically important to our region's **community, economy, and environment**. This report, *Vital Signs—Assessing the State of Chesapeake Agriculture in 2005*, represents an effort by the Chesapeake Bay Foundation and leading agricultural experts in the region to take the pulse of agriculture in Maryland, Virginia, and Pennsylvania.

We asked experts to suggest important indicators and pursued dozens of potential indicators, selecting the twelve that follow. We looked at all the data we could find and while perspectives will differ on the

meaning of the data, we attempted to limit our interpretations to conclusions we believe can be explained based on the data. The information compiled has been averaged across the region. As a result, differences among farms and states are not necessarily reflected. Also, due to changes in data gathering methodology put in place in 2002 for the USDA Census of Agriculture, direct comparisons with prior years were done with great care.

The report notes progress made in recent years; identifies current threats to the future of agriculture in the region; and

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Family Farm, Lancaster County, PA

suggests strategic opportunities for ensuring the economic viability of agriculture while also ensuring clean water.

Agriculture varies widely across the Bay region. The western part is dominated by small to medium dairies and grass-based cow-calf beef operations. Crop production in the western part of the region is largely pasture, hay, and other livestock feed to support the beef and dairy operations, with some corn, soybean, vegetable, and fruit production. Swine production is limited in the region, but concentration occurs in southern Pennsylvania and southern Virginia. The region is a major national producer of poultry with concentrated production in the Shenandoah Valley of Virginia, the Eastern Shore of Maryland, and in south central Pennsylvania. The eastern part of the region is dominated by the production of corn, wheat, and soybeans, but has substantial vegetable and small fruit production and a rapidly expanding nursery and greenhouse industry.

Farms and farmers contribute significantly to the Bay region's economy. The market value of the agricultural products sold in the

Bay states equaled nearly \$8 billion in 2002.

Supporting agriculture and saving the Bay are not either/or decisions. Without healthy, thriving farms, we can not have clean streams and rivers or a healthy Chesapeake Bay. This report acknowledges the creative ways regional farmers help reduce pollution from farms and, at the

same time, asserts that more needs to be done to reduce pollution from all sources, including agriculture. There can be no question about farmers' willingness to accelerate progress when economic sustainability and environmental protection are companion outcomes.

Our conclusion is that although agriculture in the Bay region is productive, it also faces mounting threats. There is broad public support for agriculture and saving the Bay, and our leaders have committed to taking action. We hope *Vital Signs—Assessing the State of Chesapeake Agriculture in 2005* generates discussion about needed new policies and encourages individuals to consider the many personal choices we can each make to secure a viable future for agriculture. Private citizens, businesses, and governments make decisions every day that affect water quality. We encourage all citizens, from farmers to urban and suburban residents, to consider the impacts of their decisions on the future of agriculture and the quality of their local streams and rivers and the Chesapeake Bay. Finally, CBF is committed to working with farmers and others to ensure the future of agriculture in the region.

INDICATORS

Number of Farms: **Weak**



In the last 50 years, the number of farms in the Bay states has declined nearly 75 percent, from approximately 350,000 to about 100,000. The greatest number of losses occurred before 1975; since then, the numbers of farms has stabilized. The recent stability is related to an increase in the number of small, part-time and life style farms.

We rate the **Number of Farms weak**, noting the decreased number of economically viable farms that can generate a livable income for farmers and that contribute to the economies of their local communities.

Source: *USDA Census of Agriculture*



On the Ground

THE VALUE OF ONE FARM—WHAT'S LOST WHEN WE LOSE IT

Oregon Dairy, George Hurst's family dairy farm (pictured below) in Lancaster County, PA, makes an economic contribution to the local community far beyond its production of milk. While the Hurst's 400-cow herd produces \$1.2 million worth of milk annually, along with \$92,000 in other income, the local economic impact—through money returned to the community by purchasing local supplies and hiring local labor—of this one family farm is between \$2.7 million and \$3.7 million annually. Mr. Hurst estimates that he spends 90-95 percent of his income in the local community for supplies and labor. Many of these same dollars are then spent again and again within the community, the impact being \$2 to \$3 for every \$1 from the farm.



Hurst Farm, Lancaster County, PA

CBF Staff



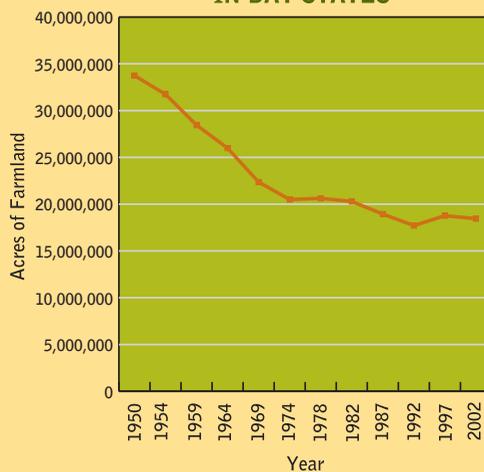
Acres of Farmland: Unhealthy

Farmland is an essential resource on which our region's diverse food production system, as well as related local agricultural businesses, depends. Additionally, well-managed farmland is a desirable land use, essential to good water quality and replenishment of aquifers. Since 1950, total farmland acreage in the Bay states has declined by 45 percent, from 33.7 million in 1950 to 18.5 million in 2002. More than 90,000 acres, almost 150-square miles, are lost each year to growth and development in the Bay states. "Prime farmland," (defined by soil type and slope) makes up less than half of the region's total farmland but is disproportionately developed because of its desirable open and relatively flat features. In recent years, preservation programs, land conservancies, and improved planning and zoning by many local governments have begun to address the problem.

We rate the number of **Acres of Farmland unhealthy**, noting a significant decline in total farmland and a critical loss of the most productive farmland.

Source: USDA Census of Agriculture

ACRES OF FARMLAND IN BAY STATES



Federal Farm Payment Distributions: Weak

From 1995-2003, the federal government paid \$131 billion dollars in conservation and subsidy payments to the nation's farmers. While this amount is not insignificant, the federal Farm Bill has not distributed dollars fairly across farms or regions.

This inequity does not serve the best interest of Bay region taxpayers, farmers, or communities. When comparing the amount of federal dollars a state receives to the value of that state's production, we find that Chesapeake Bay region farmers do not receive equitable payments.

A major reason for this inequity is that farm subsidies primarily benefit a handful of "program" crops including corn, soybeans, cotton, rice, wheat, and sugar. Livestock and poultry farmers, like those who make up much of the farming population in this region, receive few benefits, and fruit and vegetable farmers receive no production subsidies

from the government. Differences among the crop subsidies are largely historical and political artifacts, dating back to a Depression-era program designed to give temporary relief to farmers for growing certain crops. In no way can anyone argue that the existing differences reflect a carefully considered approach to farm policy.

We rate **Federal Farm Payment Distributions** weak. A good rating would mean that the Farm Bill distributed payments equally across regions and farm production types, so that a state would receive payments proportional to its agricultural output. This potentially could bring tens of millions of additional federal dollars to Bay state farmers, including much needed funding to expand implementation of conservation measures. A healthy rating would occur when farm economics are strong enough that no federal crop subsidies are required to support farmers, with some federal payments continuing to provide societal benefits of farm conservation, disaster relief, and a safety net for food security.

Sources: *USDA Census of Agriculture and Environmental Working Group*

Currently, Chesapeake farmers receive an average of four cents (\$.04) of federal agricultural funding for every dollar in production. The national average is six cents (\$.06). In some states, such as North Dakota, farmers receive three times as much as Chesapeake farmers.

Local and Regional Markets: **Unhealthy**



Local and regional markets, where consumers buy food products directly from farmers or from retailers that rely on local or regional producers, contribute to the economic health of farming and reduce transportation energy costs and consumption. When consumers purchase locally grown foods, their money remains in the local economy, magnifying the positive economic impact of farm production. Local markets also provide a greater return to farmers who receive a higher percentage of the retail price for their products when compared to selling to wholesalers and other retailers, a relationship described in the following indicator, Farm Share of Food Dollar.

Farm advocates feel that local and regional markets hold great promise. Because there are so few of them, however, these markets currently have a small impact regionally and nationally. Sales of food products directly from farmer to consumer in the Bay region have averaged just one percent of total agricultural sales consistently over the past twenty years. The lack of available farm labor and local and state regulations on food processing and marketing can also constrain local and regional markets.

Based on the current trend, we rate **Local and Regional Markets** unhealthy. There is hope for the future, however. In the past decade, there has been dramatic growth in farmers' markets, farm-to-school and farm-to-restaurant programs, and other direct sales efforts.

Sources: *USDA Census of Agriculture, Direct Marketing, www.sare.org, www.ams.usda.gov/farmersmarkets*



Farm Share of Food Dollar: **Unhealthy**

One measure of the economic health of farming is the portion of consumers' food spending that farmers receive, i.e., the farm share of the food dollar. This is a factor that is particularly relevant to vegetable, fruit, livestock, dairy, and poultry farmers, but less relevant to grain farmers.

The trend is a shrinking farm share, while other factors—food processing, distribution, and retail—garner increasing portions of food dollars. In 1952, American farmers received 47 cents for every dollar consumers spent on food in retail grocery stores. By 2000, that had dropped to 20 cents, a 57 percent decrease in the farmers' share.

We rate **Farm Share of Food Dollar** **unhealthy** because of the dramatic decline of the farmers' share of food dollars over the past 50 years. However, because of the region's large population base and its proximity to Northeast markets, the potential to increase the farmers' share of the food dollar through local and regional sales is greater in the Bay states than in most other regions of the U.S.

Source: USDA—Economic Research Service



Opportunities for New Farmers: **Weak**

One of the biggest problems facing agriculture is the range of economic barriers facing those wanting to enter farming. Rising costs of land, farm equipment, fertilizer, and fuel have made it increasingly difficult for new farmers to get started.

While net farm income—defined as revenue minus expenses—has risen over time for farmers in the Bay region, many factors affect net farm income, and the increase masks great differences and changes among farms. Gains in productivity and increasing farm size have contributed to continued growth, albeit irregular, in net farm income since the 1960s. At the same time, land prices have

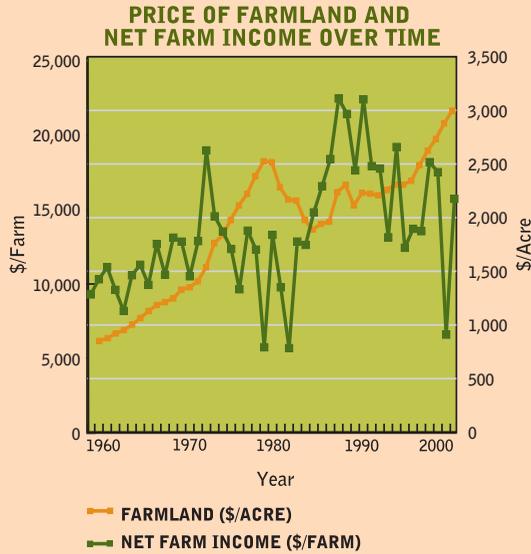
According to USDA, from 2001 to 2005 the average farm family in the U.S. only earned 9.5 percent of its household income from farming operations. Off-farm work accounted for approximately 90 percent of the average farm family's income.

also risen—and at a significantly faster rate than net farm income. Land is the single greatest cost for most individuals entering agriculture, and development pressures are driving land prices out of reach for many. While a retiring farmer may benefit from increased land equity, a son or daughter may not be able to afford to buy shares of the farm passed on to, and owned by, siblings.

High land prices, combined with wide variability in net farm income from year to year can make it difficult to acquire long-term mortgages for land or expensive farm equipment. The combine pictured below costs five times what it would have cost 30 years ago.

We rate **Opportunities for New Farmers** weak because costs of farming continue to increase faster than crop and livestock prices.

Source: USDA-Economic Research Service



On the Ground

EQUIPMENT—A DRAMATICALLY RISING FARM COST

A factor that has encouraged the move to larger farm operations is the cost of farm equipment. In the mid-1970s, a grain combine cost approximately \$40,000. A farmer needed about 400 acres of cropland to justify its purchase. Today, combines can cost as much as \$200,000 or more, forcing a farmer to work approximately 2,700 acres of cropland to justify the purchase of a combine.



Combine

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Diversification of Farm Production: Weak

Diversity has provided strength to farming in the Bay region; we have a mix of small, medium, and large farms producing a wide variety of farm products. Increasingly, however, our region's food production is concentrated on fewer, larger farms. In 1987, 14 percent of the farms in the Bay states generated 75 percent of total agricultural sales. By 2002, that percentage had declined by almost half, with only eight percent of our farms accounting for 75 percent of sales.

The issue of fewer farms producing the bulk of our food is especially important in the livestock industry, which provides the economic foundation of the region's agriculture. Livestock products such as milk, meat, and poultry products consistently account for well over 60 percent of farm sales.

Animal production has changed dramatically, however, particularly for pork and poultry. Economies of size, risk management, and tight farm profit margins have led to increased concentrations of pork and poultry operations. These larger units make economic sense for individual operators, but fewer farms can participate as producers. Greater concentration also has created local nutrient imbalances from manure that can be costly to manage safely.

The issue of concentration has complex economic, social, and environmental implications. But agriculture is stronger when more farms play a meaningful role in producing our food, not less. Thus, we rate **Diversification of Farm Production** weak.

Source: USDA Census of Agriculture



Fertilizer Efficiency: Good

Trends in fertilizer applications indicate how well farmers are managing a critical economic and environmental factor for crop production.

Decreases in fertilizer applications per acre, combined with steady or growing crop yields, suggest that farmers are managing commercial fertilizer more efficiently and substituting manure for commercial fertilizers, a smart move if manure is applied based on careful soil testing.

Fertilizer and lime application increased rapidly beginning in the 1950s and peaked in 1974. Since then, it has leveled off and begun to decline. The decline in fertilizer application rates from the mid-70s to the present correlates with farmers' increased use of nutrient management planning to address nutrient pollution and water quality, and the rising costs of fertilizer.

We rate **Fertilizer Efficiency** good because many farmers have improved their commercial nutrient use efficiency with positive results for farm economics and water quality.

Source: USDA Census of Agriculture

FERTILIZER & LIME EXPENDITURES

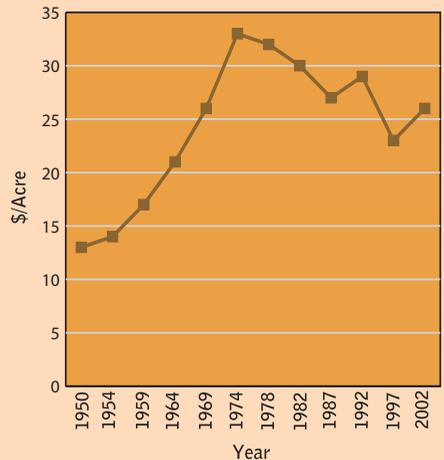


Figure shows fertilizer and lime applications in dollars per acre over time. Prices are held constant so that a change in dollars per acre reflects a change in actual pounds of fertilizer applied.

Reduction of Nitrogen in Surface Water: Weak

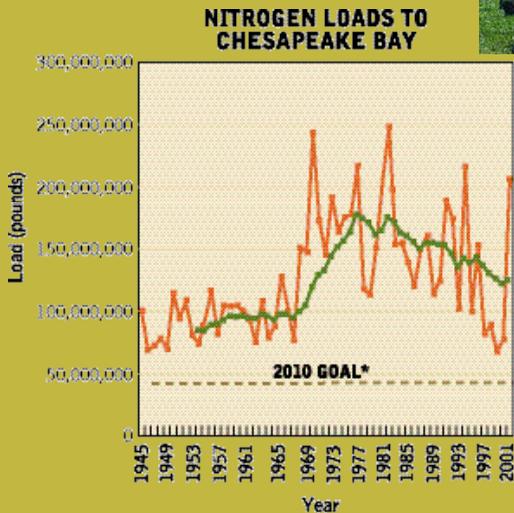


Nitrogen pollution is the number one threat to Bay health. On the farm, however, nitrogen is critical for successful crop production.

Nitrogen pollution from agriculture increased significantly during the 1960s and 70s. This was a period of corresponding increases in crop yields and the use of nitrogen fertilizer, as well as a period of concentration and intensification of animal agriculture in the region. Starting in the early 1980s, nitrogen loads leveled off and began a slow decline that continues today. This timing corresponds to farmers' increased implementation of nutrient management.

We rate **Reduction of Nitrogen in Surface Water** **weak**. The reductions to date are only a little more than a third of the reductions needed to achieve nitrogen loading goals set for agriculture in the Tributary Strategies. Current conservation practices must be more widely implemented and innovative practices (such as reducing the amount of nitrogen in animal feeds as some dairy farmers in VA and PA are beginning to do) must be encouraged.

Source: EPA Chesapeake Bay Program



— TOTAL BAY LOAD-AG CONTRIBUTION
— 10-YEAR ROLLING AVERAGE-AG CONTRIBUTION

* This is an estimate of the nitrogen loads from agriculture once the tributary strategies are fully implemented

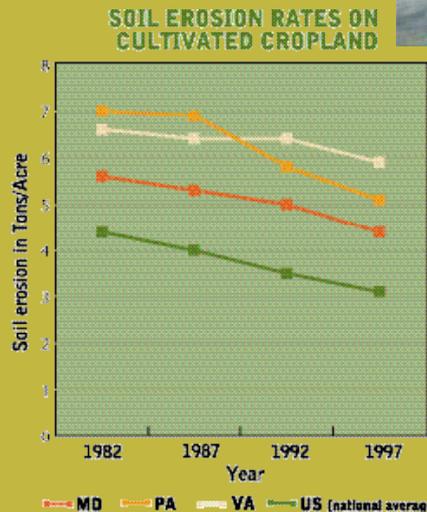
Soil Erosion: Fair



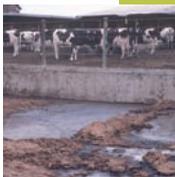
Because high-quality soil is a requirement for agricultural production, preventing erosion is critical to agricultural sustainability. Soils that run off the land also choke the Bay and its rivers and streams, and transport phosphorus pollution that further degrades water quality. Bay watershed farmers, many of whom have been leaders in the development of no-till and conservation tillage systems, have substantially reduced erosion. However, increased efforts are needed to further reduce erosion, as reduction rates lag behind the national average.

We rate **Soil Erosion** **fair**, noting substantial progress, tempered by the fact that erosion rates remain above “tolerable” levels required for maximum productivity and improved water quality.

Source: USDA-NRCS National Resources Inventory



— MD — PA — VA — US (national average)



Phosphorus in Agricultural Soils: **Unhealthy**

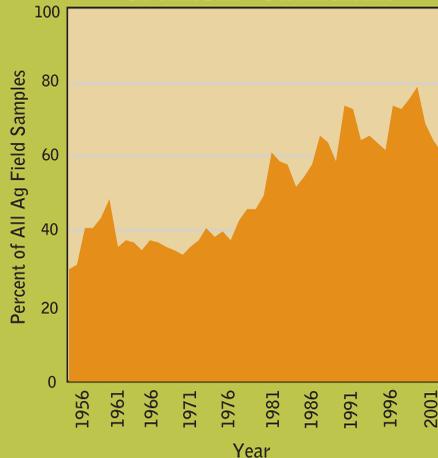
Pollution in the form of excess phosphorus is another major cause of water pollution. Phosphorus, an important plant nutrient, accumulates in soil when it is applied at rates in excess of crop needs.

For most of the last 20 years, University agronomists and others encouraged farmers to apply manure to the land based on crop nitrogen needs. Manure has far more phosphorus in it than nitrogen relative to crop needs, so manure application has resulted in an over-application of phosphorus. Research now shows that phosphorus can be lost in runoff when levels in soil are very high, even when controlling erosion. A healthy condition would be for soil phosphorus levels to be no higher than optimum levels for crop use (as determined by soil tests), and for counties with historically high animal populations to achieve steady reductions in soil phosphorus levels through nutrient management and alternative uses of manure.

We rate **Phosphorus in Agricultural Soils unhealthy**. The Bay states have just begun requiring consideration of phosphorus levels in manure application, so there is reason to hope this indicator will improve. The greatest surpluses occur in the major animal production areas of the Delmarva Peninsula, the Shenandoah Valley, and Lancaster County, PA.

Source: Mid-Atlantic Regional Water Quality Program

PERCENT OF AGRICULTURAL FIELD SAMPLES TESTING "OPTIMUM" OR HIGHER



Soil tests from MD show the build up of phosphorus in MD farm fields. This build up coincides with the growth and concentration of livestock and poultry operations.

Source: Coale. 1999. In Agriculture and Phosphorus Management. Sharpley, Editor. P 47



Chesapeake Bay Agriculture Tributary Strategy Implementation: **Weak**

In the landmark **Chesapeake 2000 Agreement (C2K)**, the Bay states committed to removing the Chesapeake Bay and its tidal tributaries from EPA's "dirty waters" list by 2010. To achieve this goal, the reductions needed from all sources of nitrogen and phosphorus pollution—sewage treatment plants, storm water, septic systems, air, and agriculture—far exceed current efforts.

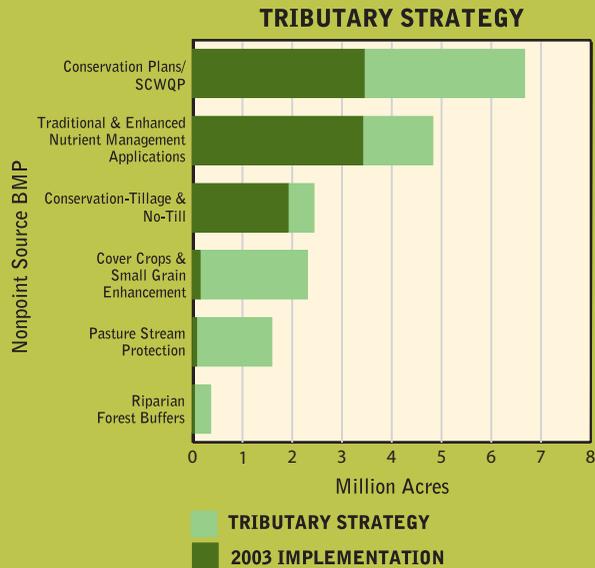
As of 2005, action to accelerate implementation of agricultural nutrient reduction practices—conservation plans, traditional and enhanced nutrient management, conservation tillage and no-till, cover crops, pasture stream protection, and riparian forested buffers—is lacking. Current levels of effort and funding will not achieve the water quality needed to restore the Bay and its rivers. The federal-state Chesapeake Bay Program estimates that

\$450 million annually, of which only \$80 million is currently available, is needed in agricultural funding to meet the goals of C2K.

Farmers have made substantial progress in conservation, but the costs of implementation are difficult for farmers to bear alone. We cannot achieve the proposed practice implementation levels without tremendous increases in effort and funding.

We rate Chesapeake Bay Agriculture Tributary Strategy Implementation weak.

Source: EPA Chesapeake Bay Program



On the Ground

FARMERS PROTECTING THE ENVIRONMENT

Julian and Patti Price know the value of fencing cows out of the river, streams, and ponds on their farm. The Prices operate a 1000-acre cow-calf beef operation near Luray, VA, and have won numerous awards for the many conservation practices they have implemented. Fences installed to prevent cattle from accessing the steep slope along the riverbanks have helped to prevent erosion and sediment runoff into the river, and significantly reduced veterinary bills. The implementation of a rotational grazing system has made handling their cattle and managing their pastures much easier for the family. A new watering system now provides a good supply of clean drinking water for their herd. Mr. Price commented, “Without state and federal cost share programs to help pay for these practices, the conservation measures we have implemented on this farm simply wouldn’t have been done.”



Price Farm, Page County, VA

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Agriculture is in a very precarious position throughout the six-state, Chesapeake Bay Watershed. We must work together to assure a brighter future.

Farmers, who care so much about their land, clean water, and clean air, are being squeezed. Commodity prices have changed little over several decades, fuel and other costs have risen steeply, and the price of farm land has sky rocketed. Not surprisingly, the pressure to "sell out" for development is huge.

While some believe that more regulations on farmers should be imposed, we believe a spirit of mutual trust and an agreement to address farm profitability, region-wide, will pay real dividends. Clearly, government investment in conservation technology for farmers has been inadequate. This must change if farming is going to remain viable and clean water goals are to be met.

William C. Baker, President
Chesapeake Bay Foundation
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Indicator Photos courtesy of Getty Images and CBF Staff