U.S. House of Representatives
Committee on Transportation and Infrastructure
Washington, DC 20515

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September 18, 2009

SUMMARY OF SUBJECT MATTER

TO: Members of the Subcommittee on Water Resources and Environment

FROM: Subcommittee on Water Resources and Environment Staff

SUBJECT: Hearing on the "Reauthorization of the Chesapeake Bay Program"

PURPOSE OF HEARING

The Subcommittee on Water Resources and Environment will meet on Tuesday, September 22, 2009, at 2:00 p.m., in room 2167 of the Rayburn House Office Building to receive testimony from representatives of the U.S. Environmental Protection Agency (EPA), the states of Maryland, Pennsylvania, and Virginia, the University of Maryland, and other stakeholder entities on the reauthorization of the Chesapeake Bay Program (the Bay Program).

BACKGROUND

This memorandum summarizes both the state of the Chesapeake Bay (the Bay), and efforts to protect and restore it through the Bay Program. In 1983, the states of Maryland, Pennsylvania, and Virginia, the District of Columbia, the Chesapeake Bay Commission (the Bay Commission),[1] and the EPA signed the first Chesapeake Bay Agreement (the Bay Agreement) with the aim of protecting and restoring the Bay. The Bay Agreement resulted in the creation of the Bay Program, a partnership that directs and conducts activities towards the restoration of the Bay. The Bay Program is authorized through section 117 of the Clean Water Act (33 U.S.C. § 1267). EPA's Chesapeake Bay Program Office, based in Annapolis, Maryland, provides support to the Bay Program.

[1] The Bay Commission is a tristate legislative commission representing Maryland, Pennsylvania, and Virginia.

I. The Chesapeake Bay and the Chesapeake Bay Watershed

The Bay is the largest of the nation's estuaries. Largely located between Maryland and Virginia, it is nearly 200 miles long, 35 miles wide at its largest point, and covers more than 4,500 square miles. Having an average depth of only 21 feet, the Bay is relatively shallow.

Estuaries are bodies of water that receive both inflows from rivers and tidal inflows from the ocean. The Bay receives approximately half of its water from the Atlantic Ocean, and the other half is freshwater from the numerous rivers and streams that enter the Bay. The Susquehanna River is the largest source of freshwater entering the bay, providing approximately 50 percent.

The Chesapeake Bay watershed (the Bay watershed) is that geographic area from which water ultimately drains into the Bay (*see figure below*). The watershed includes the District of Columbia and parts of six states: Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia. It covers approximately 64,000 square miles.

Figure: Chesapeake Bay Watershed

Source: US EPA Office of Inspector General

The population of the Bay watershed has been steadily increasing since the mid-20th century. Between 1950 and 2000, the watershed's population nearly doubled from over eight million

to nearly 16 million individuals. The Government Accountability Office (GAO) estimates that the population of the Bay watershed will reach 18 million by 2020.

The Bay is a rich habitat for a wide variety of plants and animals. It is home to 3,700 species including blue crabs, ducks, herring, oysters, shad, and striped bass.

II. The State of Chesapeake Bay

State of the Chesapeake Bay: The Bay ecosystem, including water quality, is under stress. Sustained and excessive levels of pollution have resulted in water quality and habitat degradation, and have also contributed to the decline in populations of some species.

According to the Bay Program, the overall health of the bay did not improve in 2008. This is consistent with multiple decades of poor ecosystem health. Based off of an index developed by the Bay Program, comprised of water quality, habitat, and fish and shellfish population indicators, the health of the Bay averaged 38 percent – with a score of 100 percent representing a fully restored ecosystem, which is the goal.

Water quality is the most important measure of the Bay's health. The Bay Program measures water quality according to four parameters: dissolved oxygen,[2] water clarity,[3] chlorophyll *a*,[4] and chemical contaminants.[5] The index score for water quality across these factors is 21 percent. As a result, the Bay Program has determined that water quality in the Bay is very poor. From 2006 to 2008, water quality in the Bay decreased from 23.6 percent to 21.4 percent of all goals achieved.

According to the EPA, the key to restoring water quality in the Bay watershed is to achieve significant reductions in nitrogen, phosphorous, and sediment loads. In 2008, total estimated nitrogen and phosphorus loads from the watershed to the Bay were 311 million pounds and 19 million pounds, respectively. To meet water quality goals for the Bay, EPA has determined that nitrogen and phosphorus loads will have to be reduced by 44 percent and 27 percent respectively, despite expected population increases of 30 percent between 2000 and 2030.

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[2] Oxygen present in the water occurs in a dissolved form. Fish and shellfish require dissolved oxygen to survive. According to the Chesapeake Bay Program, between 1987 and 2008, dissolved oxygen goals increased from 14.7 percent to 16.4 percent.

[3] Good water clarity allows underwater grasses to grow. Underwater grasses provide important habitat for a number of aquatic species. Pollution can cause sediment and promote the growth of algae – both of which block sunlight, create cloudy water, and impede the growth of underwater grasses. According to the Bay Program, between 1985 and 2008, water clarity decreased from 37.5 percent to 13.7 percent.

[4] Chlorophyll *a* is found in algae and used to determine the presence and amount of algae in the Bay. Algae make up the base of the food chain and therefore help to support aquatic species found in the Bay, such as fish and oysters. According to the Bay Program, the scores necessary to achieve healthy levels of algae decreased from 47.6 percent in 1985 to 27.3 percent in 2008 of goals achieved for this performance measure.

[5] This measure consists of toxic chemicals that can be found in fish, sediment, or water. These constituents can impair both ecosystem and human health. The 2006 impaired water listings for Maryland, Virginia, and DC found 30 of 89 tidal tributary segments (33.7 percent) contained no impairment for chemical contaminants. The 2008 listings found that 25 of 89 segments (28.1 percent) contained no impairment for chemical contaminants.

The Bay Program found that its habitat measure was 45 percent in 2008, unchanged since 2007. The Bay Program measures habitat according to four parameters: bay grasses,[6] phytoplankton,[7] bottom habitat,[8] and tidal wetlands.[9] From 1996 to 2008, this measure has improved from 41 percent to 45.3 percent of goals achieved.

Fish and shellfish populations remain below desired levels. The Bay Program reported that 48 percent of the goals had been achieved in 2008. The fish and shellfish measure is composed of five parameters: the abundance of blue crabs,[10] native oysters,[11] striped bass,[12] shad,[13] and juvenile menhaden.[14] In 2000, the fish and shellfish measure was scored at 48.2 percent, similar to 2008.

Sources of Chesapeake Bay Pollution: The primary pollutants impairing the Bay are excess nutrients and sediment. These primarily consist of nitrogen, phosphorus, and sediment that come from throughout the Bay watershed. The sources of these pollutants consist of agricultural runoff, wastewater treatment facilities, land-use changes and urban stormwater, and atmospheric deposition.[15]

Agricultural runoff of nutrients and sediment is the largest source of pollutants into the Bay. The runoff of nutrients, such as nitrogen or phosphorus, into the Bay and its tributaries often occurs

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[6] Underwater grasses serve a variety of important ecological functions, including serving as habitat, improving water clarity, adding oxygen to the water, and reducing shoreline erosion. A Bay-wide measure of underwater grasses found 76,861 acres in 2008 (41.5 percent of goals achieved), compared to 38,228 acres in 1984 (20.7 percent of goals achieved).

[7] Phytoplankton or algae are very sensitive to many water pollutants. Too much or the wrong kind of algae can be detrimental to the overall health of waters by decreasing oxygen, blocking sunlight, and harming aquatic life. In 2008, 53 percent of the phytoplankton goals had been achieved. According to the Bay Program water clarity is still too poor to support healthy phytoplankton communities. However, between 1986 and 2008, phytoplankton goals achieved did improve from 46.1 percent to 52.9 percent.

[8] The Bay Program takes samples of bottom sediments to determine the types, abundance, and health of bottom-dwelling organisms. According to the Bay Program, in 2008, 42 percent of the bottom of the Bay met bottom habitat goals. Low dissolved oxygen levels are the primary cause of degradation for bottom habitat. The health of the Bay's bottom habitat has decreased from 52.4 percent in 1996 to 41.5 percent in 2008.

[9] Tidal wetlands provide habitat, absorb rainwater runoff, and filter pollutants. The Bay Program reports that in 2005, there were approximately 283,946 acres of tidal wetlands in the Bay.

[10] Blue crabs rely on good water quality and healthy underwater habitats, especially underwater grasses. In 2008, the population of spawning age blue crabs was 120 million, or 60 percent of the goal. The goal achieved figure has decreased from 138 percent in 1990 to 60 percent in 2008.

[11] Overharvesting, water pollution, and diseases have resulted in drops in native oyster populations. In 1986, the biomass goal achieved was 10 percent. This subsequently decreased to 8.6 percent in 2007.

[12] The Bay is the primary spawning ground for striped bass on the east coast of the United States. While striped bass goals have been achieved, scientists remain concerned about disease – specifically mycobacteriosis. The female biomass goal for striped bass was 108 percent (89.6 million pounds) in 2006. This is an increase from 8.5 million pounds in 1982. According to the Bay Program, a fishing moratorium in the late 1980s and commercial quotas and recreational limits in the 1990s restored the stock.

[13] Shad are a central link in the food web between plankton and predatory fish. Shad populations have shrunk due to overfishing, pollutants, and artificial structures such as dams that obstruct their upstream spawning grounds. In 2007, the Bay Program reported that the abundance of shad was at 22 percent of the targeted goal.

[14] Juvenile menhaden serve important ecological roles by being prey for predator fish like striped bass, and by filtering water. Menhaden are used for fish oil, bait, and fish meal. Menhaden populations are healthy along the Atlantic coast, but low in the Chesapeake Bay. The percentage of times that fishery researchers have positively identified juvenile menhaden in their studies has dropped from 24 in 1959 to 18 in 2008.

[15] Atmospheric deposition is a process by which airborne pollutants settle directly onto the surface of a water body (direct deposition), or reach a water body indirectly through deposition onto land surfaces and subsequent run-off through wet weather events (indirect deposition).

as a result of over-application of fertilizer and following precipitation events. Sediment runoff from agricultural areas is also a source of impairment. According to the Bay Program, the implementation of practices to reduce agricultural runoff has resulted in a decrease in the amount of agricultural runoff – nutrients and sediments - that enters the Bay. These best management practices include planting winter cover crops, and planting vegetative buffers at the edge of tributaries or the Bay. The Bay Program reports that in 2008 the agricultural sector was responsible for 45 percent of total phosphorus loadings, 43 percent of total nitrogen loadings, and 60 percent of total sediment loadings.

Wastewater treatment facilities also contribute to nutrient loadings into the Bay and Bay tributaries. According to the Bay Program, these facilities contribute 19 percent of the nitrogen loadings, and 21 percent of the phosphorus loadings in 2008. In 2005, Bay jurisdictions began putting into place a new permitting approach that requires hundreds of wastewater treatment facilities to install a new generation of nutrient reduction technologies.

New land development (including urban and suburban development) is increasing nutrient and sediment loads at rates faster than restoration efforts are reducing them. Loadings from developed and developing lands include urban stormwater runoff, septic systems, and runoff from mixed open areas (golf courses and parks). Development often displaces natural, absorbent surfaces with hard impervious surfaces. Precipitation that may have been absorbed, instead hits a hard surface, like concrete, a building, or a road, in a developed area and is quickly channelized into streams or other waters. This results in increasing levels of water, nutrients, sediment, and other pollutants into these streams, causing further erosion and excess loadings.

In addition, increased population growth and development is associated with increased vehicle usage, resulting in higher levels of atmospheric deposition of pollutants.

Development in the Bay watershed often occurs on formerly agricultural or forested lands. Therefore, agricultural runoff may be displaced with urban stormwater runoff. Improvements in landscape design and stormwater management practices can decrease urban and developed land runoff issues. However, the Bay Program notes that "pollution increases with land development…have surpassed the gains achieved from improved landscape design and stormwater management practices." This, in combination with significant population increases, has resulted in increased adverse impacts from this source. The Bay Program reports that in 2008 urban and suburban development and runoff contributed to 31 percent of the phosphorus loadings, 16 percent of the nitrogen loadings, and 19 percent of the sediment loadings to the Bay.

Atmospheric deposition stems from emissions from vehicles, power plants, agriculture (ammonia from animal feeding operations), and industry. Pollutants from these emissions, including nitrogen and land directly on water bodies (direct deposition) or on land are ultimately carried into water bodies (indirect deposition). In 2008, the Bay Program determined that atmospheric deposition (direct and indirect) was responsible for 22 percent of the total nitrogen loadings to the Bay.

The Bay jurisdictions rely upon federal and state air pollution control programs to reduce atmospheric deposition loadings. EPA and the Bay Program had relied on the Clean Air Interstate Rule (CAIR) to reduce eight million pounds of nitrogen deposition by 2010. However, in early July 2008, the United States Court of Appeals for the District of Columbia Circuit struck down this rule.

Accordingly, neither EPA nor the Bay Program can expect to use this mechanism for nitrogen deposition reductions.

The figures provided in the appendix illustrate the relative sources for nitrogen, phosphorus, and sediment, according to the Bay Program's 2008 figures. These figures also include references to whether given sources are regulated or unregulated under the Clean Water Act.

While parts of six states and the District of Columbia comprise the Bay watershed, most of the pollutant loading comes from only three: Maryland, Pennsylvania, and Virginia. It is important to note that while each produces pollution from the same types of sources, the share of each of these loading sources is different, per state. This is a function of the types of economy, geography, and population centers. The significance of these differential loadings is that each state will require different approaches to decrease its respective loadings. In other words, each state will have to apply resources differently to cost effectively decrease its own loadings.

III. Efforts to Restore the Chesapeake Bay

The Chesapeake Bay Agreements: In the 1970s and early 1980s, EPA found that degradation of the Bay was taking place as a result of nutrient runoff, population increases, and discharges from wastewater treatment facilities. In response, in 1983, the states of Maryland, Pennsylvania, and Virginia, the District of Columbia, the Bay Commission, and the EPA signed the first Bay Agreement.

The Bay Agreement established the Chesapeake Executive Council (the Executive Council), and resulted in the Bay Program. The Executive Council meets annually and consists of the governors of Maryland, Pennsylvania, and Virginia, the EPA Administrator, the Mayor of the District of Columbia, and the Chair of the Bay Commission. Subsequent Bay Agreements were signed in 1987, 1992, and 2000.

The Bay Program is a partnership that directs and conducts the restoration of the Bay. It was authorized by section 117 of the Clean Water Act. It currently includes partners at the Federal, state, and local levels, as well as academic institutions, and nonprofit organizations.

EPA's Chesapeake Bay Program Office (CBPO) provides support to the Executive Council and the Bay Program. Among its responsibilities are the development and provision of information on the environmental quality and living resources of the Chesapeake Bay ecosystem. It also is responsible for coordinating EPA's activities with other federal agencies and state and local authorities participating in Chesapeake Bay restoration activities. The Bay Program produced an assessment of Bay health and restoration progress in April 2008: *Chesapeake Bay 2007 Health and Restoration Assessment: A Report to the Citizens of the Bay Region.*

Chesapeake 2000: The most recent Bay Agreement, *Chesapeake 2000*, is identified by the Bay Program as its strategic plan. In this agreement, the Bay partners agreed to improve water quality in the Bay and its tributaries so that these waters would be removed from EPA's impaired waters list by 2010. This result would mean avoiding a requirement to develop a Total Maximum Daily Load

(TMDL)[16] for the Bay. The non-signatory Bay watershed states of Delaware, New York, and West Virginia also agreed to the *Chesapeake 2000* water quality goals, and signed onto a six-state Memorandum of Understanding with EPA.

In 2006, senior EPA managers, and in 2007, the Executive Council, acknowledged that the *Chesapeake 2000* water quality goals would not be achieved. As a result, the Bay Program has committed to creating TMDLs for the Bay. A court-ordered deadline for the completion of these TMDLs is 2011. EPA and members of the Bay Program have committed, however, to completing the TMDL by the end of December, 2010.

The Chesapeake Action Plan: In December 2007, Congress passed the Consolidated Appropriations Act of 2008 (P.L.110-61) and directed EPA to implement all of the recommendations of a 2005 GAO report titled *Chesapeake Bay Program: Improved Strategies are Needed to Better Assess, Report, and Manage Restoration Progress* (GAO-06-09)[17] and to develop a Chesapeake Action Plan (CAP). The CAP would contain specified components that include realistic annual targets, actual activity reports, amounts and sources of funding, and a process to track and measure progress.

The Bay Program's Chesapeake Action Plan was released in July 2008 and titled, *Strengthening the Management, Coordination and Accountability of the Chesapeake Bay Program, Report to Congress*. The goal of the CAP was to improve and accelerate the coordination, integration, and implementation of efforts to protect and restore the Bay. The Bay Program and its partners envision the CAP as an adaptive management system that should be responsive to the complex, partner-driven Bay restoration system. The CAP includes four components:

1. A strategic framework unifying the Bay Program's existing planning documents and clarifying how Bay Program partners will pursue Bay restoration and protection goals;

2. An activity integration plan with data that identifies and catalogues Bay Program partners' implementation activities and corresponding resources;

3. Summaries of key information, including progress towards Chesapeake 2000 goals, summaries of actions and funding, and challenges and actions needed to expedite progress;

4. An adaptive management process to identify how information and analyses will provide input to Bay Program partners' actions, emphases, and future priorities.

2009 Obama Administration Executive Order 13508: On May 12, 2009, President Obama issued Executive Order (E.O.) 13508 to protect and restore the Bay watershed. The E.O. called the Bay a national treasure and directed the Federal Government to exercise greater leadership and actions to restore the Bay. It also established a Federal Leadership Committee. Comprised of senior representatives from the Departments of Interior, Defense, Commerce, Homeland Security, Agriculture, and Transportation, and chaired by EPA, the Federal Leadership Committee is charged

[16] A TMDL is a calculation of the maximum amount of a pollutant a waterbody can receive and still meet water quality standards, and an allocation (wasteload allocation) of that amount to the pollutant's sources.
[17] Mittal, Anu K., *Chesapeake Bay Program: Improved Strategies Are Needed to Better Assess, Report, and Manage Restoration Progress* (2006).

with compiling information from a series of draft reports to develop a single, integrated strategy defining actions to restore the Bay. This strategy is due on November 9, 2009.

In May 2009, the Federal Government, along with the District of Columbia and the six states in the Bay watershed agreed that by no later than 2025 they would have completed implementing the measures necessary to restore water quality in the Bay watershed.

On September 10, 2009, the Administration released a series of draft reports pursuant to E.O. 13508. These draft reports were authored by a variety of Federal agencies and make a series of recommendation across a variety of areas to improve the health of the Chesapeake Bay ecosystem. The draft reports consist of:

- Draft Report Section 202(a): Defines the next generation of tools and actions to restore water quality in the Bay. The draft report also describes the administrative changes that will be made to federal programs, policies, and regulations to implement these actions;

- Draft Report Section 202(b): Recommends how to target resources to better protect the Bay and its tributary waters. These include resources provided under authorities such as the Food Security Act of 1985, the Clean Water Act, and other Federal laws;

- Draft Report Section 202(c): Recommends strengthened stormwater practices at Federal facilities and on Federal lands in the Bay watershed. It also recommends developing a stormwater mitigation best practices guidance;

- Draft Report Section 202(d): Calls for an assessment of the impacts of climate change on the Bay and the development of a strategy for adapting natural resource program and public infrastructure to the impacts of climate change on water quality and living resources in the Bay watershed;

- Draft Report Section 202(e): Calls for an expansion of public access to the Bay, its tributaries, and open spaces from federal lands. Recommendations also include conserving landscapes and ecosystems in the Bay watershed;

- Draft Report Section 202(f): Calls for a strengthening of scientific support for decision-making for restoring the Bay and its watershed. This includes expanding environmental research and monitoring and observing systems; and

- Draft Report Section 202(g): Calls for the development of focused and coordinated habitat and research activities. These are intended to protect and restore living resources and water quality in the Chesapeake Bay and its watershed.

WITNESSES

PANEL I

The Honorable Robert J. Wittman
Virginia's First District
U.S. House of Representatives

The Honorable Gerald E. Connolly
Virginia's Eleventh District
U.S. House of Representatives

PANEL II

Mr. J. Charles Fox
Senior Advisor to the Administrator
United States Environmental Protection Agency

Ms. Shari Wilson
Secretary
Maryland Department of the Environment

Mr. L. Preston Bryant, Jr.
Secretary
Secretary of Natural Resources

Mr. George S. Hawkins
Director
District of Columbia Department of the Environment

The Honorable P. Michael Sturla
Ninety-Sixth District
Pennsylvania House of Representatives

Mr. John A. Cosgrove
Chair
Chesapeake Bay Commission

PANEL III

Ms. Cathy Drzyzgula
Council Member
City of Gaithersburg

Testifying on behalf of: Metropolitan Washington Council of Governments

Mr. Jerry Johnson
General Manager
Washington Suburban Sanitary Commission

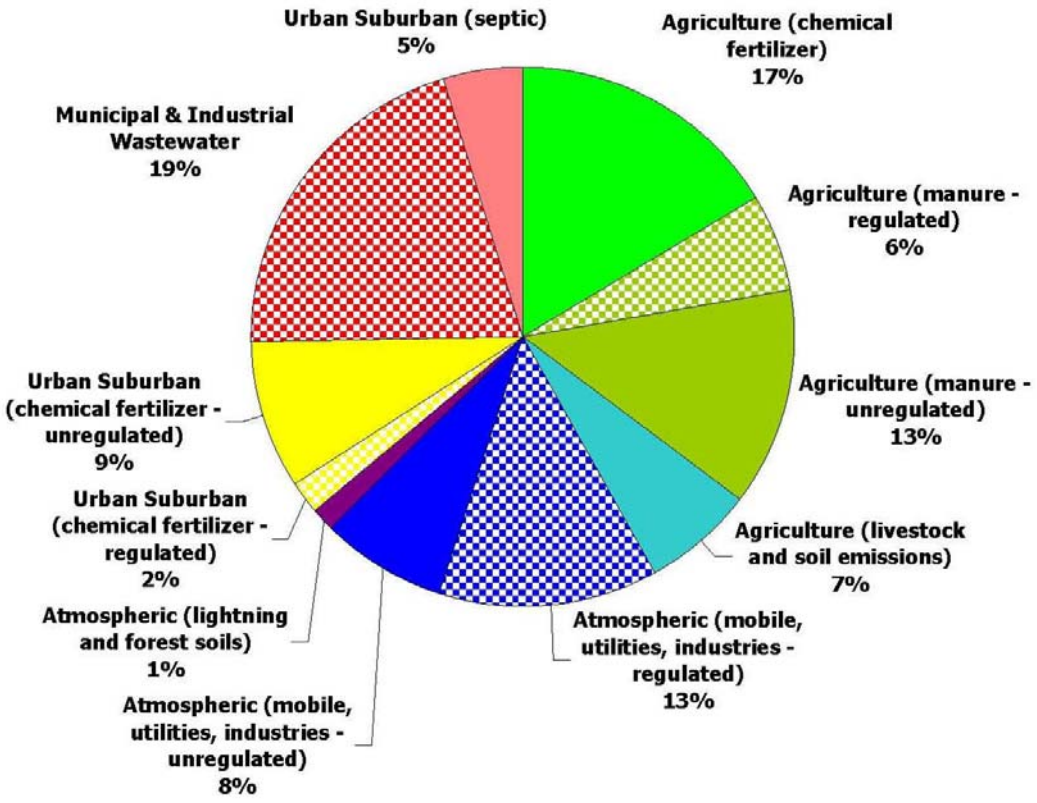
Dr. Russell B. Brinsfield
University of Maryland

Ms. Molly Pugh
Executive Director
Virginia Grain Producers Association

Mr. Peter Hughes
President
Red Barn Consulting, Inc.

APPENDIX

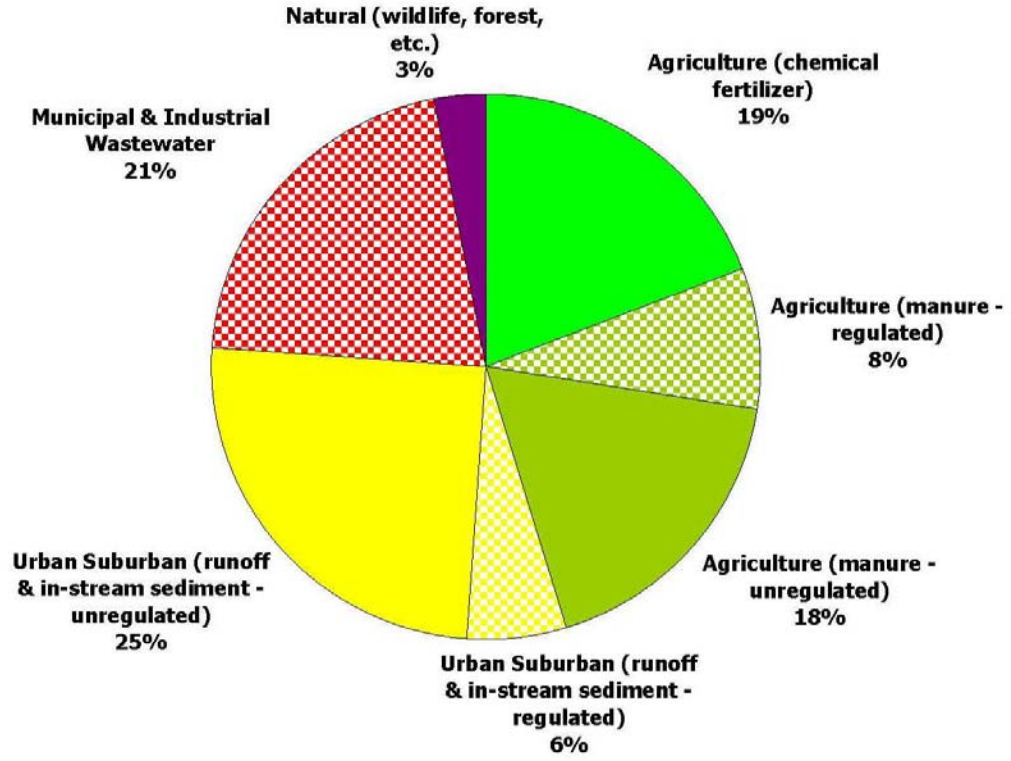
Sources of and Federal Regulatory Status for Delivered Loads to the Bay: Nitrogen



60% of the total nitrogen load to the Chesapeake Bay is <u>not</u> subject to Federal regulation.

Source: Chesapeake Bay Program Phase 4.3 Watershed Model

Sources of and Federal Regulatory Status for Delivered Loads to the Bay: Phosphorus

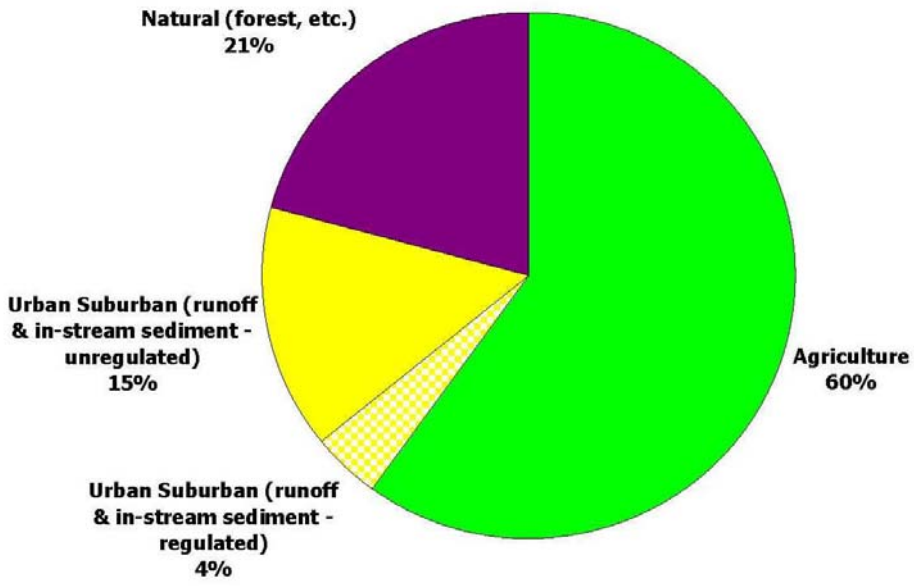


Federally regulated

65% of the total phosphorus load to the Chesapeake Bay is <u>not</u> subject to Federal regulation.

Source: Chesapeake Bay Program Phase 4.3 Watershed Model

Sources of and Federal Regulatory Status for Delivered Loads to the Bay: Sediment



Federally regulated

96% of the total sediment load to the Chesapeake Bay is not subject to Federal regulation.

Source: Chesapeake Bay Program Phase 4.3 Watershed Model