

Report to
House Subcommittee on Fisheries, Conservation,
Wildlife and Oceans

For May 18, 2004
Hearing on

**The Chesapeake Bay in Your
Community:
A Restoration Plan**

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Introduction

Our high school and community are located on the Broadneck Peninsula in Anne Arundel County. We are situated on the western shore of the Chesapeake Bay near the Chesapeake Bay Bridge. The Broadneck peninsula watersheds into the Magothy, Severn and Little Magothy Rivers that empty into the Chesapeake Bay.

We have identified these problems in our community that potentially have a deleterious effect on the Bay:

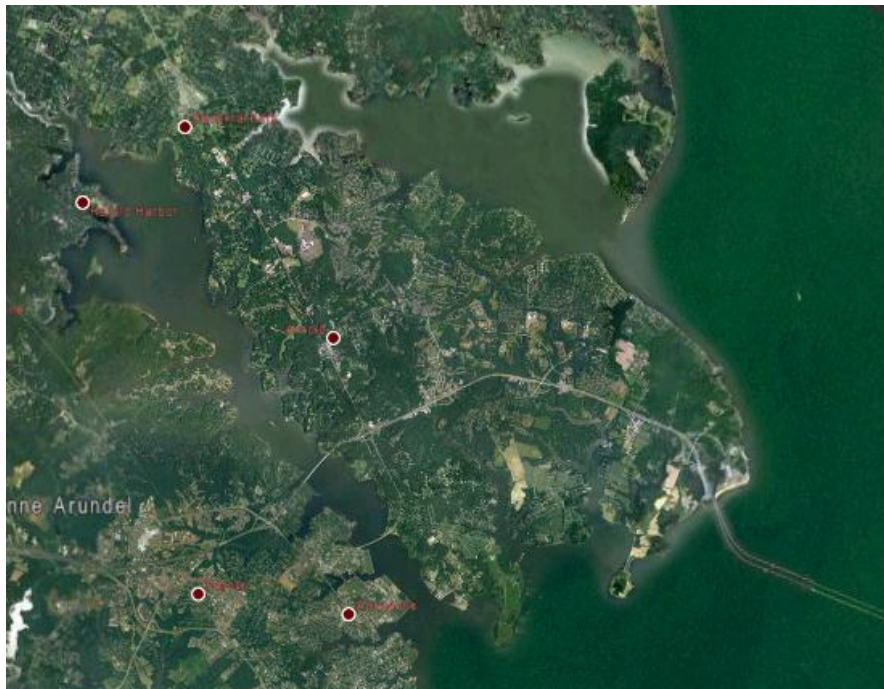
- **air pollution**
- **solid waste**
- **toxins and oil**
- **sediment**
- **nutrient loading**

Human activities on the Broadneck Peninsula that are associated with these Bay problems include:

- **development**
- **transportation**
- **habitat destruction**

We have investigated some solutions that include

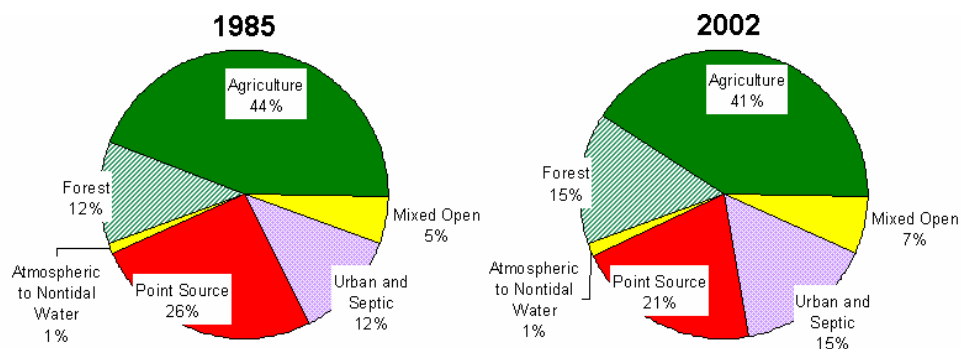
- **green technology**
- **habitat restoration**
- **conservation**
- **education and awareness**



Nutrient Loading

Each year roughly 300 million pounds of nitrogen overload the Chesapeake waterways.

1. A certain amount of nitrogen is healthy for the Chesapeake Bay: however, the nitrogen concentration in the Chesapeake Bay is six times the amount that is healthy for the bay.
 - a. Most of the nitrogen comes from the nine major tributaries
97% of the nitrogen entered the bay through the James, Potomac and the Susquehanna rivers, the three largest tributaries
The Susquehanna contributes the most out of all of the bays tributaries mostly because the river drains some of the most productive farmlands in the nation
 - b. The effects are poor water quality caused by excessive algae growth, low dissolved oxygen (dead zones during summers result in fish kills), reduced water clarity (underwater grasses are deprived of light and die).
 - c. The causes and sources of the problem include, fertilizer in runoff from agriculture and lawns, wastewater discharge from sewage treatment plants, pet feces, boats that illegally dump sewage, and urban and suburban runoff from nonpoint sources.
 - d. Human activities that contribute to nutrient loading include development, lawn care, urban and suburban runoff, mismanagement of land, air pollution, fossil fuel emissions, poor soil conservation techniques in agriculture, wastewater discharge containing nitrogen from septic systems, and with increase in population sewage plants releasing untreated sewage.
 - e. Solutions include providing forest buffer zones along waterways, tree and native grasses planning that would prevent erosion, habitat restoration, and reduction of air pollution by carpooling and purchase of more hybrid cars, solar power, energy conservation, and improved wastewater treatment.
The proposed Flush Tax could be used to upgrade sewage plants.



Total N Load: 338 million pounds

Total N Load: 278 million pounds

Source: Chesapeake Bay Program Phase 4.3 Watershed Model.

Note: Loads are from the entire watershed but do not include atmospheric deposition directly to tidal waters or loads from shoreline erosion.

Air pollution

Air pollution is more than just smog floating in the air. Through wet and dry deposition, the pollutants in the air fall to the ground and can eventually be carried into the Bay through erosion and runoff, becoming three problems, rather than just one.

Problems and sources:

1. The massive size of the Chesapeake Air Shed.
 - a. Compared to the watershed, the Air shed is six and a half times larger, having an approximate area of 418,000 sq. miles, being influenced by locations as far away as Canada, Kentucky, and South Carolina.
 - b. Air deposition contributes to about 1/3 of the total nitrogen load of the Chesapeake Bay (around 97.5 million pounds). It's estimated that 75 percent of the load will be distributed to the land, while the rest will flow directly into the water.
 - c. Nationwide, 474 counties are failing to meet standards for ground level ozone or for causing a downwind county to fail.
 - d. In the most recent "State of the Air" report released by the American Lung Association, Anne Arundel County fell from its 18th position to that of the 17th worse county in the nation.
2. Baltimore-Washington metropolitan area
 - a. Baltimore and Washington areas (Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, Howard, Calvert, Charles, Frederick, Montgomery, and Prince Georges counties) have been deemed nonattainment by the EPA for failure to meet the federal standard for ground level ozone pollution.
 - b. Last year in Anne Arundel County, there were 47 Code Orange days (unhealthy air for sensitive groups) and 17 Code Red days (unhealthy air for everyone). That's 64 days with unhealthy air during the summer.
 - c. Marylanders drive more than 135 million miles each day. These miles are responsible for up to 40 percent of Maryland's air problems. The nitrogen from the exhaust will eventually find its way into the Bay, cause up to 40 million in crop damage, and cause many health problems to the citizens living in the area.
 - d. Anne Arundel County is no exception with many of its drivers commuting to the Washington and Baltimore area for work. Our county lacks a strong public transportation program.
3. Population of the water shed
 - a. There are nearly 16 million people living in the water shed today, by 2010, at least another 3 million people will be added. The Baltimore Washington Metropolitan Region is one of the fastest growing areas in the country. This means more vehicles and more demands for power. These two sources, vehicle exhaust and smoke stacks, contribute the most to nitrogen levels in the air.

- b. Other sources include agriculture, which emits particulate matter, chemical compounds, and gasses such as ammonia.
- c. These sources of pollution, stationary (factories), mobile (car), and agricultural cause acid rain, smog, and eutrophication.
- d. Eutrophication creates dead zones, areas of water with out oxygen. Forty percent of the water in the bay suffered from low dissolved oxygen levels. Accumulated nitrates can eventually creep into sources of drinking water.
- e. In 2003, one of the largest dead zones ever recorded in the Bay's history was observed.

Solutions:

1. Offer more incentives towards alternative transportation to the work place. Through tax savings or allocated funds, employers/employees should be motivated to find different and more efficient methods to get to work. In Maryland there exists the Commuter Tax Credit, and since its introduction in 2000, more than 200 employers and 10,000 employees have joined.
2. Change patterns of land use to remove the component of driving to reduce emissions.
3. Push towards more environmental friendly methods of production of goods. Recently, there was the Clean Air Excellence Awards, which recognized 13 new, innovative environmental techniques.
4. Tax incentives may be a means of compensation for those who use environmentally friendly products, whether it is solar panels on the roof of one's house or purchase of a hydrogen car.
5. Follow in the footsteps of California and set a standard of 0 emissions to be reached by a certain year. An optimistic goal can stimulate greatness in results.



Toxins & Oil in the Chesapeake Bay

1. Oil released in the Chesapeake Bay Watershed can cause widespread contamination. The gradual breakdown of oil releases carcinogenic toxins into the Bay, harming marine life. One quart of oil can pollute up to two million gallons of drinking water. Four quarts of oil (the amount needed for a typical car) can create an oil slick as large as eight acres.

2. Some of the organisms at risk are:
 - a. Fish in the Bay will take oil into their gills.
 - b. Oysters, clams, submerged aquatic vegetation will suffer from reduced oxygen because of the layer of oil on the surface.
3. Human Activities that result in the release of oil include negligent dumping of motor oil into landfills, sewers/storm drains, and directly onto the ground. This can result in contamination of groundwater and much of the oil reaches the Chesapeake Bay.
4. Solutions include:
 - a. Recycling Oil because 42 gallons of crude oil is needed to refine two quarts of lubricating oil; only one gallon of recycled oil is needed to produce the same two quarts of lubricating oil.
 - b. Community action providing education for citizens through scheduled community meetings or signs on disposal of used oil.
 - c. Local, countywide, and/or statewide programs to collect recycled oil.
5. Support groups for implementation of the above solutions could include private organizations such as the Chesapeake Bay Foundation or county and state government.



Solid Waste

1. Solid waste includes municipal solid waste (generated by residents and businesses) and roadside litter. Trash is washed from roadways into waters that flow into the Chesapeake. Dumping litter overboard is illegal and can destroy habitat and kill wildlife.
 - a. Landfills, if not designed and operated properly, can result in ground water contamination from volatile organic compounds (VOCs), cyanide, and heavy metals including lead.
 - b. One such incident was the contamination of the Patapsco Aquifer (the most productive water source in the county). Such chemicals from the 80-acre Smuck dump contaminated it in 1983. Contamination was also found in sediments of Furnace Creek that borders the site and connects to the Chesapeake Bay.



- c. To fight contamination, in 1997, the State amended the Consent Agreement requiring the County to cap the landfill with clean soil, install a landfill gas management system and a leachate collection system, collect sediment samples, and perform air monitoring.
- 2. Solutions include:
 - a. Increase of recycling programs. Paper contributes to 37 percent of all solid waste in landfills.
 - b. Toxic waste should be disposed of in appropriately designed facilities only (i.e. oil).

Sediments

- 1. Sources
 - a. Sediments are the loose particles of soil, clay, and other substances that are suspended in the water.
 - b. The main sources of sediments are agriculture, high way construction, building sites, forest clearing, and shoreline erosion. The sediments from these sites may contain nutrients, oils, pesticides, and other pollutants.
- 2. Problems
 - a. Suspended sediment clouds the water that reduces access of underwater vegetation to sunlight inhibiting growth. Loss of growth reduces dissolved oxygen levels and depletes habitat for other organisms such as crabs and fish.
 - b. Sediments smother bottom dwelling plants and animals (i.e. SAV, oysters, and clams).
 - c. Loose sediments fill in ports and waterways, and block the passages of streams.
- 3. Solutions
 - a. Planting and protection of shoreline vegetation. Stricter regulations can help in creating stronger buffer zones composed of cord grass, phragmites, and stream bank fencing to keep domestic animals from eroding shorelines.



- b. Planting of underwater grasses to help trap sediment and reduce wave action that causes shoreline erosion. Broadneck High School participates in “Grasses for Classes,” a project in which students grow grasses in their classrooms and plant them in their bay.
- c. Storm water management plans include rain barrels and rain gardens.
- d. Reducing the amount of impervious surfaces (i.e., turf roofs).

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Bay Related Activities at Broadneck High School:

- Broadneck High School was selected as a Bay School by the Chesapeake Bay Foundation and was a part of the Bay School Project from 2000 – 2003. The purpose of the program was to utilize the Chesapeake Bay as an integrating context to deliver curriculum. This project was based on studies indicating that when the environment is used as an integrating context, scores on standardized tests improve, disciplinary referrals decrease, and a heightened sense of community develops in the school. We continue to work with the Chesapeake Bay Foundation through their Chesapeake Classrooms program.
- Bay Days occur each fall during which the entire freshman class participates in interdisciplinary Chesapeake Bay related activities including a service-learning project.
- Students in a number of science and social studies classrooms are growing and studying underwater Bay grasses. In June the students will plant the grasses in local waterways. This is the 3rd year we have participated in this program.
- Over the last 5 years Broadneck students have planted over 1,000 trees on our campus. The year following 9-11 we planted 83 commemorative trees in memory of all countries that lost citizens that day. This year we planted 30 trees at Sandy Point State Park. The source of funding for these plantings came from grants from the Chesapeake Bay Trust and the State Department of Natural Resources.



- This spring the Outdoor Science Club led by an Eagle Scout applicant will install rain barrels on the campus field house and will plant native plants in a memorial garden to be watered by the rainwater collected in the barrels.
- Several school clubs are dedicated to environmental improvement. These clubs are Recycling Club, the Outdoor Science Club, and the Broadneck Beautification Club.
- Three years ago Broadneck speech students collected oral histories from watermen and others who are intimately connected with the Bay and published a book entitled, Shoes, Ships, and Sealing Wax. This book heightened awareness in our community of the importance of the Bay and its plight.
- English students continue to write children's books that are Bay related and to share them with local elementary students.
- Advanced Placement Environmental Science (a college level course) enrollment has grown to 150 students for the 2004 – 05 school year and 50 students have enrolled in environmental science (a high school level course).
- Students plan to share this report with the county council, the Chesapeake Bay Foundation, the Magothy River Association, and the Severn River Association.