Water Works

MONITORING THE DC•MD•VA WATERWAYS

+ Personal testimonies from people who know & love the Chesapeake Bay

spring 2009

SPECIAL REPORT

By Brittany Schell

RIPPLE EFFECT

How explosive urban and suburban growth impact the Chesapeake Bay

ALSO IN THIS ISSUE

Long overdue: Anacostia sewer separation

Blue Plains treatment plant in need of funding

Tap water vs. bottled water: Which is safer?

Brittany Schell

Honors Capstone Project

Print Journalism & Graphic Design

Spring 2009

Adviser: Lynne Perri

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EDITOR'S NOTE

+ special thanks to Lynne Perri, who was a great help and a resource during this project

After spending the semester researching this project, I have learned a lot about the Chesapeake Bay and the area's waterways. There are an infinite number of topics and many nooks and crannies in the stories that follow which I hope to continue to explore.

One aspect that struck me during my research about the Chesapeake restoration effort is the inequality between those who are messing up the bay and those paying for it.

For example, one of the largest contributors of pollution to the bay are large agricultural operations like the chicken farms packed onto the Delmarva peninsula. The runoff from animal waste and crop fertilizer is the leading source of nitrogen pollution for the bay, yet agriculture remains a nearly unregulated industry.

Instead of the agriculture industry or other polluters being forced to pay for the damage they cause, the burden is passed on to communities.

The watermen around the bay who are forced to limit their crab harvesting because the blue crab population is still declining — they are paying.

The low-income families forced to live in neighborhoods such as the Anacostia region of D.C., which was virtually deserted by investors because of the poor quality of water from the Anacostia River — they are paying.

The taxpayers in Maryland who have new fees added to their bills each year to cover repairs and upgrades for overburdened and underfunded sewer systems and waste treatment plants — they are paying.

Sure, these people contribute to the pollution of the bay and the area's waterways. We all use the sewer systems, drive a car, fertilize the lawn or wash dish soap down the sink. But it seems to me that the burden of restoration is unfairly reapportioned to individuals and communities. Big polluters need to step up and pay their fair share.

Brittany L. Schell

SOURCES

interviews

JORGE AGUILAR

LEON BILLINGS

JIM CONNOLLY

SUSAN DEFORD

JOSEPH DOSS

RICHARD DOVE

STEPHEN EDBERG

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written

CHESAPEAKE BAY FOUNDATION
STATE OF THE BAY REPORT

CHESAPEAKE BAY PROGRAM
BAY BAROMETER

ENVIRONMENTAL SCIENCE AND TECHNOLOGY JOURNAL

PBS FRONTLINE DOCUMENTARY
"POISONED WATERS"

PETER SINGER & JIM MASON
"THE ETHICS OF WHAT WE EAT"

HOWARD ERNST
"CHESAPEAKE BAY BLUES"

HELEN ROUNTREE
"JOHN SMITH'S CHESAPEAKE VOYAGES"

JOHN WENNERSTEN
"THE CHESAPEAKE: AN ENVIRONMENTAL BIOGRAPHY"

ENVIRONMENTAL PROTECTION AGENCY
http://www.epa.gov/water/laws.html

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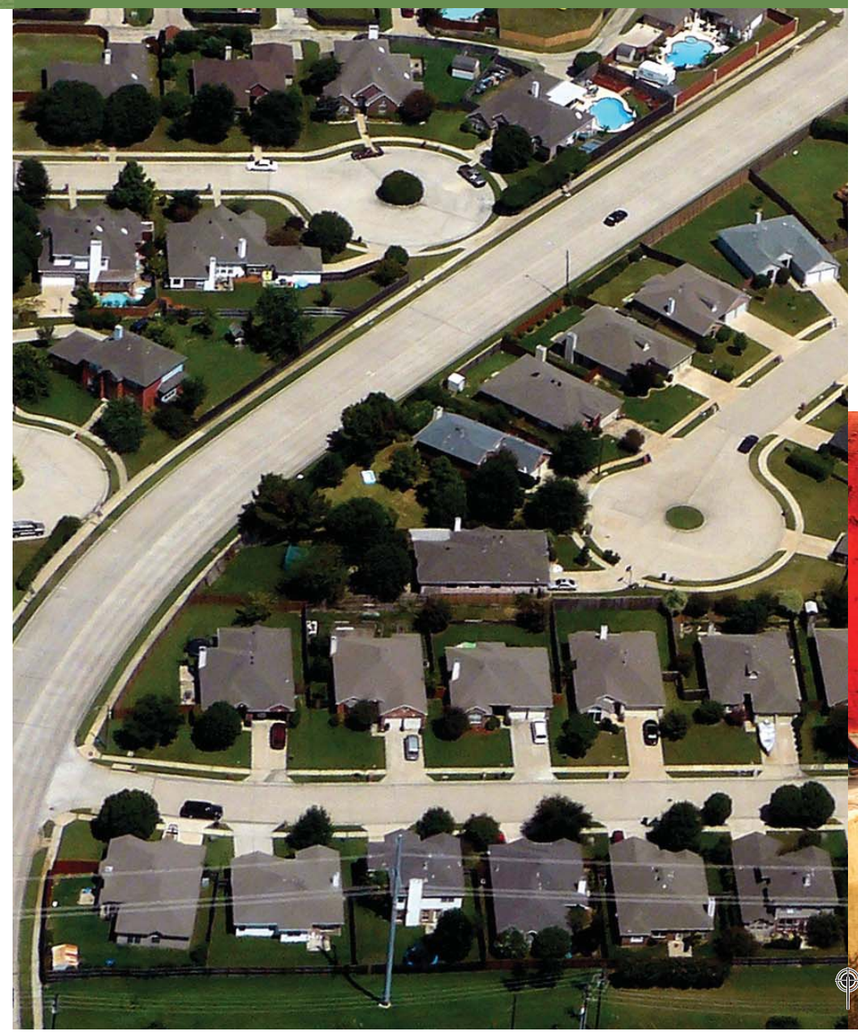
RIPPLE



More than 17 million people call the Chesapeake Bay watershed home, and scientists predict that the number living in the area will continue to grow through the next couple of decades. As a result of human activities — especially land development — harmful pollutants such as nitrogen and phosphorus make their way to the bay in huge quantities, disrupting the delicate balance of the bay's ecosytem. Human activites are destroying the bay and diminishing any real chance for its recovery.

one-quarter of the brands tested contained bacterial or chemical contamination in some samples that violated "enforceable state standards or warning levels," while almost one-fifth of the they brands tested "exceeded state bottled water microbial guidelines in at least some samples."

Hauter, of Food & Water Watch, said she was particularly concerned about a chemical called DEHP, which was found in one sample at higher levels than the EPA allows in tap water. This chemical is a potential human cancer agent and can leach from plastic into the water, she said.

This is a big concern, Hauter said. The bottled water is not tested after it is bottled. These chemicals could get into the water while it is being stored, and the consumer would never know.

In addition to the costs to the consumer, there is an environmental price to pay for bottled water consumption, said Hauter. "More than 26 billion plastic water bottles are sold each year in the U.S., and 86 percent of the empty plastic water bottles end up in landfills or are incinerated," she said.

The production of plastic bottles and their incineration release emissions that contribute to global warming. There is also air pollution from the oil used to transport these products across the country. The production of plastic-bottles in the U.S. requires more than 17 million barrels of oil a year — enough to fuel 1 million cars.

"In addition, water-mining harms our streams, rivers, wetlands and lakes," Hauter said.

Bottled water companies have started reducing their environmental impact by using light-weight plastics for containers, and increased recycling initiatives, said Joseph Doss, the president and CEO of the International Bottled Water Association.

Aguilar recommended that consumers buy a stainless steel or aluminum re-usable water bottle, instead of endless bottles of water. He said those who think their tap water is unsafe can invest in filtration systems. Tap water is cheaper, better for the environment and safer than bottled water, Aguilar said.

"The fundamental issue is consumer choice," Doss said. "If people are drinking water, whether it's tap water or whether it's bottled water, that is a good thing and people are free to make that choice."

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EFFECT

By Brittany Schell

"Almost 40 percent of bottled water on the market is actually tap water," said Sen. Frank Lautenberg of New Jersey, who sponsored the Right-to-Know Act. "Some bottlers use additional treatments to clean it, but others use merely tap water in a fancy container."

The pending Right-to-Know Act would require bottled water companies to put more information on their labels, such as water source.

The Food and Drug Administration regulates bottled water while the EPA is responsible for tap water. Many consumers are not aware of the differences in regulations for these two.

The FDA has weaker testing as well as reporting requirements than the EPA, and the public does not have regular access to the results. The EPA, on the other hand, requires regular testing for tap water and all the results are available to the public, said Mae Wu, a staff attorney in the Health and Environment Program at the Natural Resources Defense Council.

"The public should not assume that water purchased in a bottle is better regulated, more pure, or safer than most tap water," Wu said.

EPA regulations mandate that every water system serving more than 1 million people has to test 300 water samples per month. Systems serving 3 million or more people are required to conduct tests on 480 samples per month.

In contrast, the FDA requires that companies test 4 empty bottles once every 3 months for contamination. Bottled water companies also have to test a sample of their water once a week before bottling. After bottling, the water is not tested again.

These rules apply only to bottled water packaged and sold across state lines. This leaves out the 60 to 70 percent of water that is bottled and sold within a single state. About 40 states have laws of their own pertaining to bottled water, however.

In spite of these regulation differences, Dr. Stephen Edberg, a professor of medicine and chemical engineering at Yale, argued that bottled water is safer because it is tested and sealed. Nothing else happens to the product inside before it is sold.

The tests required for tap water by the EPA are inadequate, he said. "Municipal water has a terrific challenge. Tap water has to pass through a distribution system, and leaks in the pipes could let in possible contaminants," he said.

The council tested 1,000 bottles from 103 different bottled water brands for a range of contaminants. They found that

"The fundamental issue is consumer choice. If people are drinking water, whether it is tap water or whether it is bottled water, that is a good thing and people are free to make that choice."

— Joseph Doss, International Bottled Water Association president

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As a result of human activities,

the Chesapeake Bay is now in danger. Bay scientists have found significant "dead zones" in the bay — areas where dissolved oxygen levels and water clarity are so low that most life cannot sustain itself.

The populations of oysters, crabs and many iconic species of fish have declined drastically, and vital underwater grasses cover only a fraction of their historical acreage, according to a report from the Environmental Protection Agency's Chesapeake Bay Program.

The challenge of restoring the bay is made even more difficult by a ballooning human population and pollution levels that are spiraling out of control.

The Chesapeake Bay watershed — the entire area of land the drains into the bay and its tributaries — is home to 17 million people. The population of the area is expected to reach nearly 20 million by the year 2030, according to the report.

Human activity greatly impacts the Chesapeake Bay. The bay has the highest land-to-water ratio of any coastal body of water in the world — the watershed has 14 square miles of land for every one square mile of water in the bay. This high ratio is part of the reason the bay — a relatively shallow estuary — is affected acutely by human activity.

Nitrogen and phosphorus are primary sources of pollution for the bay. These two

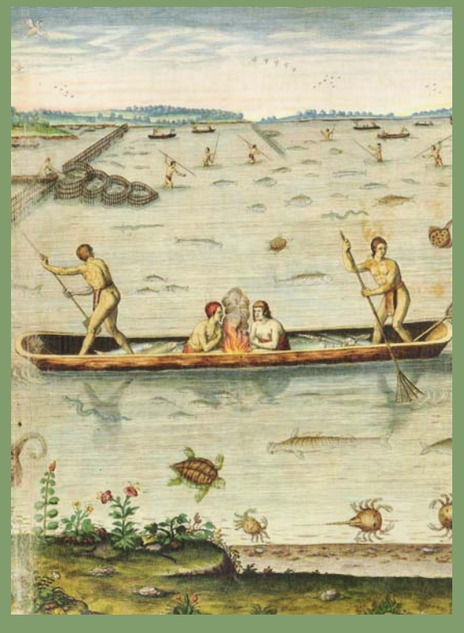
JOHN SMITH'S CHESAPEAKE BAY

"Heaven and Earth never agreed to frame a better place for man's habitation." Capt. John Smith wrote these words in his journal to describe the Chesapeake Bay as he first saw it, in the early 17th century.

Smith, who helped establish the first European settlement at Jamestown, Va in 1607, was one of the first explorers to describe the bay in writing. "Here are mountains, hills, plains, valleys, rivers and brooks all running into a fair bay, compassed but for the mouth with a fruitful and delightsome land," Smith wrote.

The paradise he described was a different environment from the modern bay. Smith's Chesapeake Bay was an estuary teeming with fish, oysters, crabs and other life. The land that surrounded the bay was almost completely forested, and the soil was rich and fertile.

Four-hundred years later, the bay is a shell of its former self. During the centuries following Smith's explorations, the human population in the watershed swelled. Forests were chopped down, industrial activity ensued, fish and shellfish were harvested, towns and cities were built and toxic chemicals were released into the environment.



TAP WATER IN THE NATION'S CAPITAL

Recent revelations about lead and chemicals present in D.C. tap water have renewed a distrust of municipal water among Washingtonians. The concerns about potentially harmful toxins have made some people skeptical of the District's tap water, which comes mostly from the Potomac.

A study published in the March issue of Environmental Science and Technology Journal found that hundreds of young children in Washington, D.C. have damaging amounts of lead in their blood due to rising levels of the toxin in the city's tap water in 2001.

The previously elevated levels of lead were caused by increased water corrosivity that was aggravated by the presence of lead service pipes in some areas, according to a statement from the Environmental Protection Agency.

The D.C. Water and Sewer Authority cited a 2004 report from the Centers for Disease Control and Prevention as having "confirmed that there was not an identifiable public health impact from elevated lead levels in drinking water," However, the authors of the study are concerned about 42,000 D.C. children who were not yet born or toddlers during the D.C. water crisis.

The most recent tests of the city's water register lead levels in the safe range, averaging at 8 parts per billion or lower — far below the 15 parts per billion maximum set by the EPA.

Lead contamination of drinking water originated with the pipes delivering the water. There are some other concerns surfacing about the quality of D.C. tap water.

Water quality experts are starting to wonder if chemical contamination in the Potomac River, the source of drinking water for the city, could impact human health.

A PBS Frontline documentary, "Poisoned Waters," followed a U.S. Geological Survey team as they tested the waters of the Potomac. The analysts were concerned about chemical compounds from household products, such as detergent, dish soap and hand lotion — seemingly inconsequential chemicals that researchers feared could be harmful in high concentrations.

About half the compounds found in the river did not have human health guidelines, said Judy Denver, a member of the survey team. These new, un-researched chemicals, such as endocrine disrupters from pharmaceutical products, were a worrisome matter for the team.

The survey team also sampled water that had already been treated at the Washington Aqueduct — the same water that could be coming out the tap of a D.C. resident.

"We found about two-thirds of the compounds we detected were still detected in finished water," Denver said.

Thomas Jacobus, general manager of the Washington Aqueduct, said as new chemicals are created and enter the water, his job gets harder. But he still trusts tap water.

"Today I drink the water with great confidence because our water meets the regulations," Jacobus said.

But when asked if she would drink water from the Potomac River, Denver said, "Absolutely not."

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Bottled water consumption

has gone up by about 2 billion gallons in the past four years. Americans drank 6.4 billion gallons of bottled water in 2004, according to Food & Water Watch, a consumer rights organization based in D.C. In 2005, the amount increased to 7.2 gallons, and in 2006, Americans drank a total of 8.3 billion gallons of bottled water, or about 26 gallons per person.

Several factors contribute to bottled water's increasing popularity. The most influential is the idea among consumers that bottled water is safer than tap water.

A 2003 Gallup survey commissioned by the Environmental Protection Agency found that 74 percent of respondents said they purchased and drank bottled water, and 20 percent said they drank bottled water exclusively. When asked why, these consumers cited health and safety concerns about tap water.

It is aggressive advertising by the bottled water industry that has led consumers to believe they are getting a better product when they purchase bottled water, said Wenonah Hauter, executive director of Food & Water Watch. In reality, she said, consumers are paying too much for this product inferior or equal to tap water.

Most Americans pay $2 per 1,000 gallons of tap water, while a 12 oz. bottle of water typically costs around $1.50, according to research by consumer rights organization.

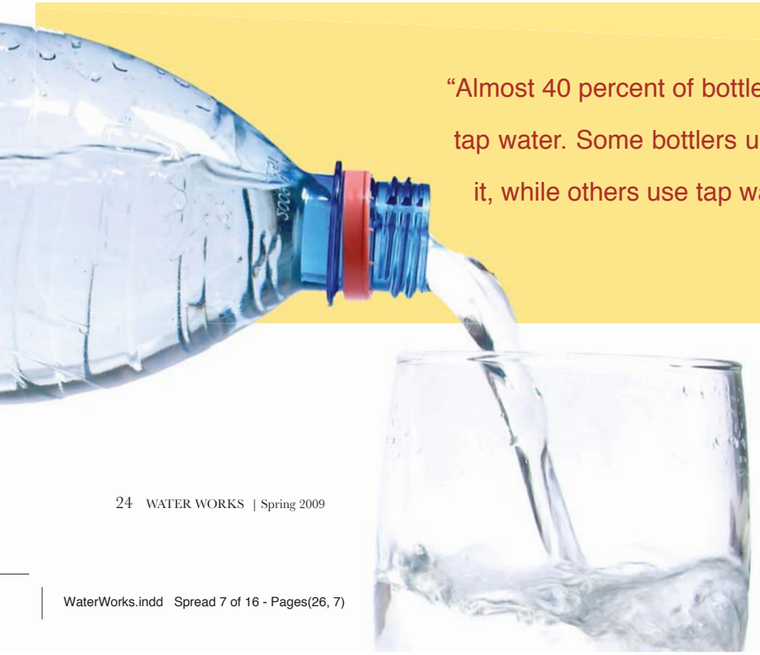
Tap water is just as clean and healthy as bottled water, said Jorge Aguilar, a campus and community organizer for the group. The idea that bottled water is superior is a "marketing myth" perpetuated by the industry, he said.

Aguilar works on the "Take Back the Tap" campaign, an initiative by his organization that aims to educate consumers about the benefits of using tap water rather than bottled water.

"I personally drink tap water," he said.

He encourages anyone skeptical of the quality of their local municipal water to contact the local utility and request a copy of the annual water quality report, which is required by law to provide information about contaminants in the water supply. This transparency is one reason why tap water is safer than bottled water, he said.

Information about bottled water is not as readily available as facts about tap water because private companies are not required by law to release the information.



"Almost 40 percent of bottled water on the market is actually tap water. Some bottlers use additional treatments to clean it, while others use tap water in a fancy container."

— Sen. Frank Lautenberg (D-NJ)

nutrients enter waterways from agriculture, urban runoff and wastewater treatment plants. While certain amounts of nitrogen and phosphorus are necessary, the balance of the bay's delicate ecosystem has been thrown off by high levels of these nutrients present in the water — largely as a result of human activity.

"The decline of the Chesapeake bay is directly linked to the rise in population of the watershed — since 1950 the number of residents has doubled," according to the annual Bay Barometer report, released in March by the Chesapeake Bay Program.

The 2008 report lists the bay's current health at 38 percent on a scale where 100 signifies a completely healthy ecosystem.

Water quality decreased by six percent since the 2007 analysis due to chemical contaminants, and is "very poor," said the report. The report also found a drop of 23 million in the population of blue crabs since the previous year. Additionally, the populations of oysters and most fish were "far below" desired levels.

The report summarized its findings succinctly: "The Chesapeake Bay ecosystem remains severely degraded."

There are many rivers and streams that flow into the bay, but just three rivers deliver 80 percent of the fresh water: the Susquehanna River, the Potomac River and the James River. The other major tributaries include the Patuxent River and the Patapsco River.

Every day, these and other tributaries carry billions of gallons of freshwater into the bay — water that contains harmful chemicals like nitrogen and phosphorus. About 291 million pounds of nitrogen and 13.8 million pounds of phosphorus reached the bay during 2008, according to the Bay Barometer report.

In 2003, the Chesapeake Bay contained one of the largest dead zones on record. This hostile area stretched 150 miles from Baltimore to the York River, according to a report by the Chesapeake Bay Foundation.

Excess nutrients were one of the main culprits contributing to the dead zone, according to the report released six years ago. High levels of nitrogen in the water stimulate huge growths of algae.

The algae blooms block sunlight

from underwater bay grasses, preventing growth. When the algae die and sink to the bottom of the bay, they decay and remove oxygen from the water, creating a hostile environment for life forms in the bay.

"As a result of nitrogen pollution, the Chesapeake Bay now functions at barely one-quarter of its estimated potential," stated the report.

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There are three primary sources of pollution for the bay related to human activity: sewage treatment plants, urban and suburban storm water runoff and agriculture. These can be classified as point-source pollution and non-point pollution.

Point-source pollution comes from one identifiable source, such as sewage treatment plants. Blue Plains Wastewater Treatment plant is the largest point source of pollution in the Chesapeake Bay watershed, according to a report released by the Chesapeake Bay Foundation.

The Blue Plains plant — along with many others — is not using the most recent technology to remove nitrogen from wastewater, according to the report. Water discharged into the Potomac River from the plant contains high levels of nitrogen, even after being treated. Large amounts of nitrogen negatively affect the river and, further down the line, the Chesapeake Bay.

The growing population in the bay's watershed produces a lot of sewage to be processed. Wastewater treatment plants are a vital step in ensuring that the water released into local rivers and the bay is safe and clean, say environmental advocates.

Upgrading major treatment plants in the watershed with advanced technology would reduce their collective discharge of nitrogen by 39 million pounds, according to the report. This reduction would make "substantial progress" toward restoring the Chesapeake Bay — wastewater discharged from sewage treatment plants is the second largest source of nitrogen pollution to the bay; the largest is agricultural runoff.

BLUE PLAINS NEEDS A FACELIFT

In the 1960s, the Potomac River was overrun with acres of green algae — a sign of nitrogen and phosphorus pollution. The river's poor water quality was caused by inadequately treated sewage from the city, according to the Chesapeake Bay Foundation. Blue Plains Wastewater Treatment Plant was the culprit.

The government eventually forced the plant to upgrade with new phosphorus and nitrogen-reducing technologies. Despite technology upgrades 2 decades ago, the plant is still releasing high amounts of nitrogen pollution — 6.2 million pounds in 2002, reported the foundation.

"This is the largest advanced wastewater treatment plant in the world," said Jim Connolly, executive director of the Anacostia Watershed Society in Washington, D.C. "There is a big problem with nitrogen coming out of that facility."

There is a plan to increase the nitrogen-processing ability of Blue Plains, said Connolly, but it might not happen soon. It is a multibillion dollar upgrade, he said, and the city's government does not have the necessary funding.

More than two-thirds of the 483 wastewater treatment plants in the bay's watershed do not use the most recent technology to remove nitrogen, according to a report from the Chesapeake Bay Foundation. Many treatment plants in the area need to be updated, not just Blue Plains.

"Upgrading these facilities is expensive and takes time," stated the report. "Numerous facilities still use older technology, and population growth is increasing the need."

Maryland's Department of the Environment estimated the cost of upgrading all the plants in Maryland at between $5 and $14 per household each year.

Despite funding difficulties, wastewater treatment plants are a relatively easy source of bay pollution to regulate when compared with non-point sources like agriculture or urban and suburban runoff.

"With sewage treatment, we continue to make the biggest gains," Connolly said. "We have clear laws, penalties, enforcements and deadlines, and we know what works."

TTLE

By Brittany Schell

Dasani, Aquafina, Nestle, Evian, Ice Mountain, Deja Blue — American consumers have a lot to choose from in terms of bottled water, and they have been buying and drinking it at a steadily increasing rate over the past few years. Some say bottled water is safer and healthier, while others argue that the industry's aggressive advertising is responsible for its popularity, insisting that tap water is actually the better choice. So which do you choose?

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TAP vs. B

THE MAIN CULPRIT: AGRICULTURE

The development of commodity agriculture has changed the Chesapeake region dramatically, and agricultural runoff is now the largest source of nitrogen pollution for the bay. Both fertilizer runoff from fields where crops are grown and manure from poultry farms contribute nitrogen pollution to the bay.

Nitrogen fertilizer is largely responsible for the dead zone in the Chesapeake Bay, and the other 145 dead zones across the world, according to authors Peter Singer and Jim Mason in their book, "The Ethics of What We Eat."

"Conventional agriculture relies heavily on synthetic fertilizers, especially nitrogen," they wrote. "Worldwide, the use of nitrogen as a fertilizer has increased tenfold in the last 50 years." Excess nitrogen in the soil makes its way into rivers, streams and, eventually, the Chesapeake Bay.

Corn is considered a leaky crop—one that does a poor job taking up nitrogen from the soil, said Dr. Howard Ernst, author of "Chesapeake Bay Blues" and a political science professor at the United States Naval Academy.

"Much of the fertilizer on a corn field finds its way to the bay," Ernst said. "The amount of corn plant has increased in recent years. By some estimates, the increase in corn production has completely offset the gains in other areas of the bay restoration effort in recent years."

Recently, attention has turned to the poulty farms in the bay area, where more than 600 million chickens a year are raised. These chickens produce more than 1.5 billion pounds of manure a year.

"These chickens produce more manure than a city of 4 million people," write Singer and Mason, "and instead of getting processed like human waste, chicken manure is spread on the fields."

The land cannot absorb the amounts of nitrogen and phosphorus contained in the manure. Sussex County, Del., which produces 232 million chickens every year, only has enough land to handle the manure of 64 million chickens, according to a University of Delaware study.

The excess nitrogen and phosphorus from chicken waste washes off into rivers or gets into the groundwater. These harmful nutrients eventually reach the Chesapeake Bay.

Growing populations increase the demand for food and land, pushing agricultural practices to be bigger and more efficient — focusing more on profit and less on environmentally friendly practices.

Over the past 50 years, per capita consumption of chicken has tripled, said Richard Dove, an environmental activist who has been gathering information for a potential law suit against agricultural polluters. Chicken farms became more intense and concentrated to meet that demand, he said.

Sources of pollution for the bay like agricultural runoff are difficult to regulate because food demand keeps growing.

The state with the biggest agricultural pollution load to the bay, Pennsylvania, has no bay property at stake in the recovery, said Ernst. Only Maryland and Virginia stand to benefit if the restoration effort is a success.

"Upstream industries have grown quite accustomed to using the bay as their toilet bowl," Ernst said. "Expecting them to voluntarily impose economic sanctions on themselves for the sake of a distant ecosystem is sheer folly."

The American agriculture industry has fought off pollution controls for 30 years, added Dove.

"We know there's bad stuff in poultry waste," he said. "Once it gets in those ditches and once those ditches begin to flow down to all these rivers on the eastern shore, it's on its way to the bay. Whatever nutrients are flowing in that river are delivered to the bay."

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Urban and suburban runoff are

a growing source of pollution. Upgrading the area's sewage treatment plants will make a dent in the fight to save the bay, but non-point pollution — from a diffuse range of sources — from storm-water runoff is an increasing form of pollution.

"Storm water runoff from urban areas is one of the biggest threats to the bay," said Jim Connolly, executive director of the Anacostia Watershed Society. "It brings all these chemicals, all of the things that are hurting the river."

As more and more land is covered by impervious surfaces — roads, rooftops, parking lots and sidewalks — more water runs into waterways instead of filtering into the ground. This runoff is carrying chemicals and other pollutants from urban centers to the bay.

From 1990 to 2000, the amount of impervious surfaces in the bay watershed increased by 41 percent — five times faster than population growth during those years, according to the Chesapeake Bay Program.

"People are moving into suburbs and bigger houses on bigger lots, causing the forests and other valuable lands to be transformed into shopping centers and parking lots," said the bay program report. "This land conversion severely impacts the health of streams, rivers and the bay."

Human activity on land has a huge impact on the Chesapeake Bay. Everyone in the watershed lives close to one of the 100,000 streams and rivers that drain into the Chesapeake. These waterways act as a direct pipeline to the bay.

Many people don't see that link. A recent survey of people living in the D.C. area showed almost no one knew the meaning of the term "watershed," said Connolly.

"This is shocking," he said. "They don't make the connection between the driveway, the house, the roof or the trees that they cut down; the connection between what they are doing on the land and what is happening in the water is not there."

DOUG SMITH

Doug and Eileen Smith live just 800 feet from the bay. They use it for recreation and enjoy its beauty everyday. Smith is also a volunteer in The Coast Guard Auxiliary, whose members help keep an eye on the bay and the surrounding rivers and creeks.

"The bay is a major business and shipping artery, a fishing and recreation Mecca, a boating and marine environment for all kinds of outdoor activities," said Smith. "The health of the bay is so important."

We should take steps to restore the bay, said Smith, but officials have to keep in mind that people still need to make their living using it. He is referring to various restrictions on crabbing, oyster harvesting and fishing placed on the bay.

"I'm not an expert, but it seems to me that the fishermen complain bitterly about the environmental actions," said Smith. "People have livelihoods and people like to eat seafood. Restrictions cause people to lose livelihoods and food prices go up. The trick is finding a balance while not going to extremes either way."

Smith said he and some of his friends believe the state is going to extremes to save the bay. Measures such as Maryland's famous "flush tax," which levied an annual fee on septic system owners to support the bay cleanup effort, are an example of the state going too far, he said.

"My patience with the lawmakers in Annapolis is stretched thin since my taxes have close to doubled since we moved here in 2001," said Smith.

His patience with Maryland residents also seems to be wearing thin. Smith spoke with exasperation about the astounding amount of trash on beaches in Maryland.

"I lived in California for over 30 years. Our roads and coastlines never looked like this," he said. "I am just completely baffled why people feel the need to throw trash overboard or litter the beaches and trails. Litter appears to be a way of life in Southern Maryland."

When he and his wife go for walks on the beach they carry garbage bags, said Smith, and often come back with one or more bags full from a two-mile hike.

"I would like to see all the various bay organizations agree more, fight less, and develop a consensus on the bay's real needs," Smith said. "I believe we are on the right track as long as we use science and not politics. Politicians should back off, and scientists should weigh in on what the needs are for the bay."

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FRED TUTMAN

The "keeper" movement began in 1983, when the original riverkeeper post for the Hudson River in New York was established in response to industrial pollution that was destroying the river. The movement grew and moved to other states, and the Waterkeeper Alliance was founded in 1999.

Today, the alliance unites the 187 keeper organizations around the world working to protect rivers, lakes, bays and other bodies of water. Each keeper is devoted to the preservation of a specific watershed.

Fred Tutman is the Patuxent Riverkeeper. He is one of 15 waterkeepers in the Chesapeake Bay area.

"We work on a full-time basis to win greater enforcement for water quality laws and to also heighten citizen vigilance," said Tutman. "We are the eyes, ears and voices of our waterways."

The biggest problem facing the Chesapeake Bay and area waterways is urban and suburban pollution, such as storm water runoff, said Tutman. This problem stems from population allocation, not actual population growth, he said.

"We are putting people in all the wrong places," said Tutman. "For example, parts of downtown Baltimore are empty, but populations are growing disproportionately in our natural resource areas. We are drawing growth to sensitive areas. In its wake we leave empty areas."

We need to redirect growth to places where populations will not do so much harm, said Tutman. The most effective strategy is to preserve natural lands and forests, rather than "wasting" money on restoration efforts that have proven largely unsuccessful, he said.

"We keep issuing more and more laws to fix what we destroyed, but we shouldn't be destroying these areas in the first place," said Tutman.

More people need to ask for change, he said. Unless this happens, Tutman does not think we will see any significant gains in bay water quality.

"We have to demand compliance," said Tutman. "If it is left up to the government, people are going to be disappointed. The government works so much better with engaged citizens. So get mad, vote and get informed. Nobody fights like a tiger like an empowered community."

SEWER SEPARATION IN ANACOSTIA

Throughout the entire Chesapeake Bay system, "toxic hotspots" contribute to the pollution of the bay through storm water runoff. These tend to be around large urban areas, such as Washington, D.C.

One "hotspot" is the Anacostia River, which runs through D.C., Montgomery County and Prince George's County in Maryland and eventually flows into the Potomac River.

A major source of pollution for the Anacostia is sewage overflow during big storms, said Jim Connolly, executive director of the Anacostia Watershed Society. In that area of D.C., the sewers are combined — the same pipes are used for wastewater and storm water.

"When there is a big rain, the pipes get overwhelmed," said Connolly. "The pipes can handle so much storm water. Eventually they reach their overflow release points, and the storm water dumps right into the river." This water has not been treated at Blue Plains, he said, so it is basically raw sewage mixed with storm water and other "gunk."

The Anacostia receives 200 billion gallons a year of overflow from sewers, which eventually flows into the Potomac River and makes its way to the bay, said Connolly.

The problem devastates the water quality of the Anacostia and the surrounding neighborhoods. "Dirty water has a negative impact on the community near it," said Connolly. "It brings down property values and increases crime."

There is a plan to solve the problem: the Combined Sewer Separation Project. This project could reduce the overflow of sewage into the river by 98 percent, said Connolly.

The project began with a lawsuit filed by Connolly's group in 1999 against the D.C. Water and Sewer Authority. The society claimed the sewer authority was not maintaining the sewer system in that part of the city.

The pumps in the Anacostia region were out of date and some were not functioning, said Connolly. Others were clogged with sediment. These problems were in addition to the combined sewage overflow problem, he said.

Last September, the D.C. government finished the basic repairs for the sewer system in Anacostia, which is now functioning at full capacity, said Connolly. But the long term component of the plan — sewer separation — has not even started yet.

The sewer separation is a 2.5 billion dollar project, Connolly said. The sewer authority is going to build huge tanks beneath the city that will act as storage facilities for storm water, he said.

When it rains, the storm water — mixed with sewage from the pipes — will flow into these tunnels rather than into the Anacostia River. Afterwards, the overflow will be pumped back into the normal pipes and travel to the Blue Plains Wastewater Treatment Plant to be processed.

"This will lead to an incredible improvement in water quality for the river," said Connolly.

The city government is trying to figure out how it will pay for this multibillion dollar project so the separation may take 25 or 30 years to complete, said Connolly.

"The challenge is, D.C. does not have a voting senator who can get a federal appropriation," Connolly said.

Without federal money, the city will pass the burden of payment on to taxpayers. The plan is to slowly raise sewer system rates for D.C. residents, said Connolly. City officials are trying to make the change gradual in order to ease the burden on low-income families, many of whom live in the Anacostia region.

Meanwhile, the Anacostia River is still hurting. There have been improvements in water quality and pollution has been reduced, but the goals of the watershed society have not been met, said Connolly.

"When I first started working here 17 years ago, we had a goal of a restored Anacostia River by 2000," he said. "We didn't get it. But we are closer. I am not sure we can get the river to a pristine level, but I think it can be much, much better. Maybe even swimmable."

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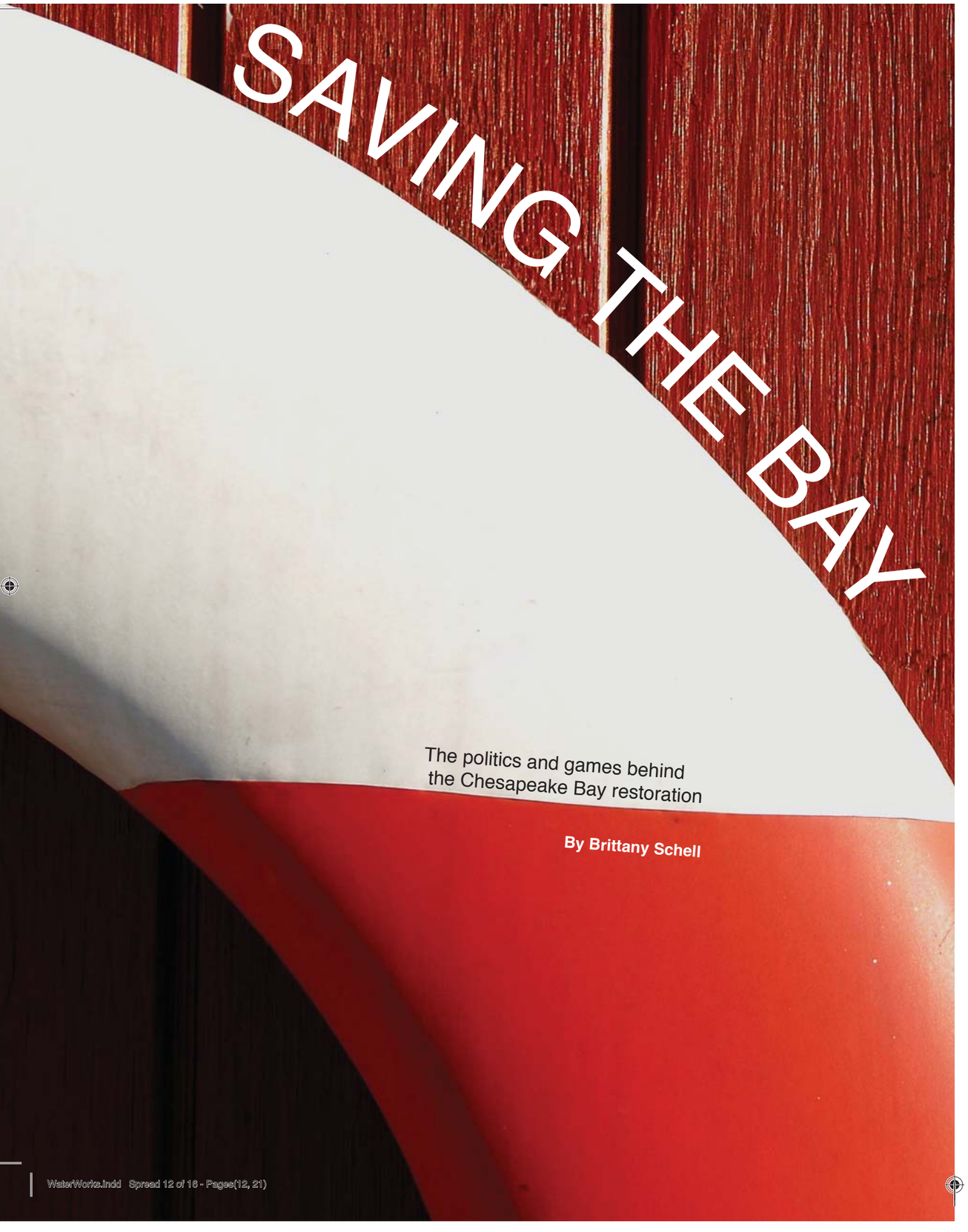


SAVING THE BAY

The politics and games behind the Chesapeake Bay restoration

By Brittany Schell

HOWARD ERNST

Howard Ernst, a political science professor at the United States Naval Academy and author of "Chesapeake Bay Blues," said he is not sure the bay will ever be restored. He refers to himself as an "anthropocentric, Hobbesian, pessimistic environmentalist," and his upcoming book about the bay is titled "The Political Dead Zone."

"I don't believe in fairy tales about how the bay is getting better when I look at the hundred-year timeline and see that it's not," said Ernst. "Don't give me computer models when real monitoring tells a very different story."

The Chesapeake Bay is functionally dead, Ernst said, because our elected leaders have given up on a truly healthy bay. He painted the restoration efforts as a "front," saying most government officials will settle for a body of water that is not hazardous to our health — a fully functioning ecosystem is not necessary in their eyes.

While the bay can be restored in a purely technical sense, said Ernst, it is unlikely from a political point of view.

"Years of neglect and foot dragging have exponentially pushed up the price of this restoration," he said. "From a political and economic perspective, our elected leaders have concluded that real restoration is impractical. They would never say this, but their actions speak for themselves."

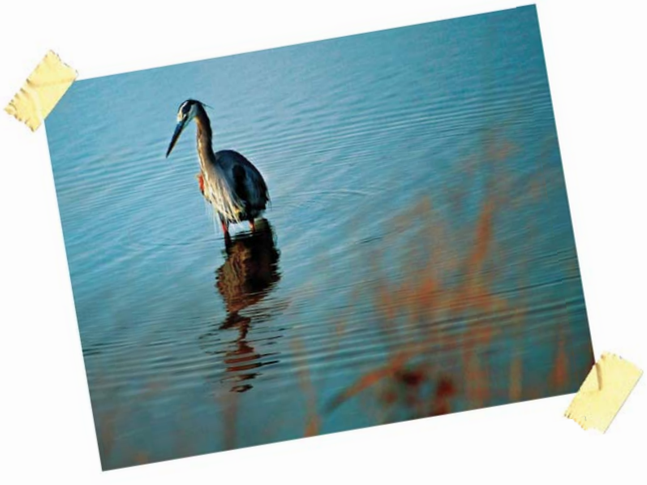
Agricultural practices remain largely unregulated, said Ernst. There has been very little positive action toward saving the Chesapeake Bay since Maryland's "flush tax" in 2004, he said.

Obsession with property rights coupled with the clout of well-financed polluters, such as agricultural industries, hamper any significant environmental progress in this country, said Ernst.

"Many people and industries believe they have the right to do with their land as they please," he said, "even if it adversely affects other people."

Most people would be willing to pay for clean water, clean air and vibrant natural resources if they were given the chance, said Ernst. The problem is that environmentalists are on the fringe — their voices are not heard in the political sphere where change is possible.

"Environmentalists need to become more mainstream if they are going to implement the widespread changes that are fundamentally necessary today," said Ernst.



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AMANDA KISNER

The legend of Chessie has been around since the 1940s. Chessie is the friendly Chesapeake Bay sea monster, said to live in the midst of the bay. There have been numerous alleged sightings over the years of a serpent-like creature swimming in the waters of the Chesapeake.

"Chessie is the only thing that made me concerned about the bay when I was 5 years old," said Amanda Kisner, now a 21-year-old Maryland native living outside of Baltimore. "We can't let Chessie die!"

The legend of Chessie signifies a deeper part of the Chesapeake Bay: the cultural significance this body of water holds for the people who live in the area.

"I think that there is a lot to be said for preserving the natural biodiversity and also for preserving the economic and cultural roots of the area for generations to come," said Kisner. "Living near the bay is a way of life for many people."

Kisner uses the bay mostly for boating and other recreation. During the summer months, she spends a lot of her time on the water. "I get a great deal of joy just out of the bay's existence," she said.

Kisner also uses the bay as a source of Maryland crabs, one of her favorite foods. Every Fourth of July, her family gets has a "crab party" at her grandmother's house.

"The bay is very important for the region. It provides economic opportunities in the way of fishing and other seafood," said Kisner. "I really, really don't want the blue crabs to die. They are delicious."

In spite of the pollution problems facing the bay and non-sustainable fishing and harvesting practices depleting populations of important species, Kisner remains optimistic that the bay will one day be restored.

"Tough legislation could turn the bay around if lawmakers would be serious about making it a priority," she said. "I think tougher legislation for pollution and overfishing needs to be passed. The real problem is that everyone in Maryland, Virginia and Delaware hears about the bay all the time. In school, on television, etc. People just assume someone is taking care of it, when things aren't really happening."

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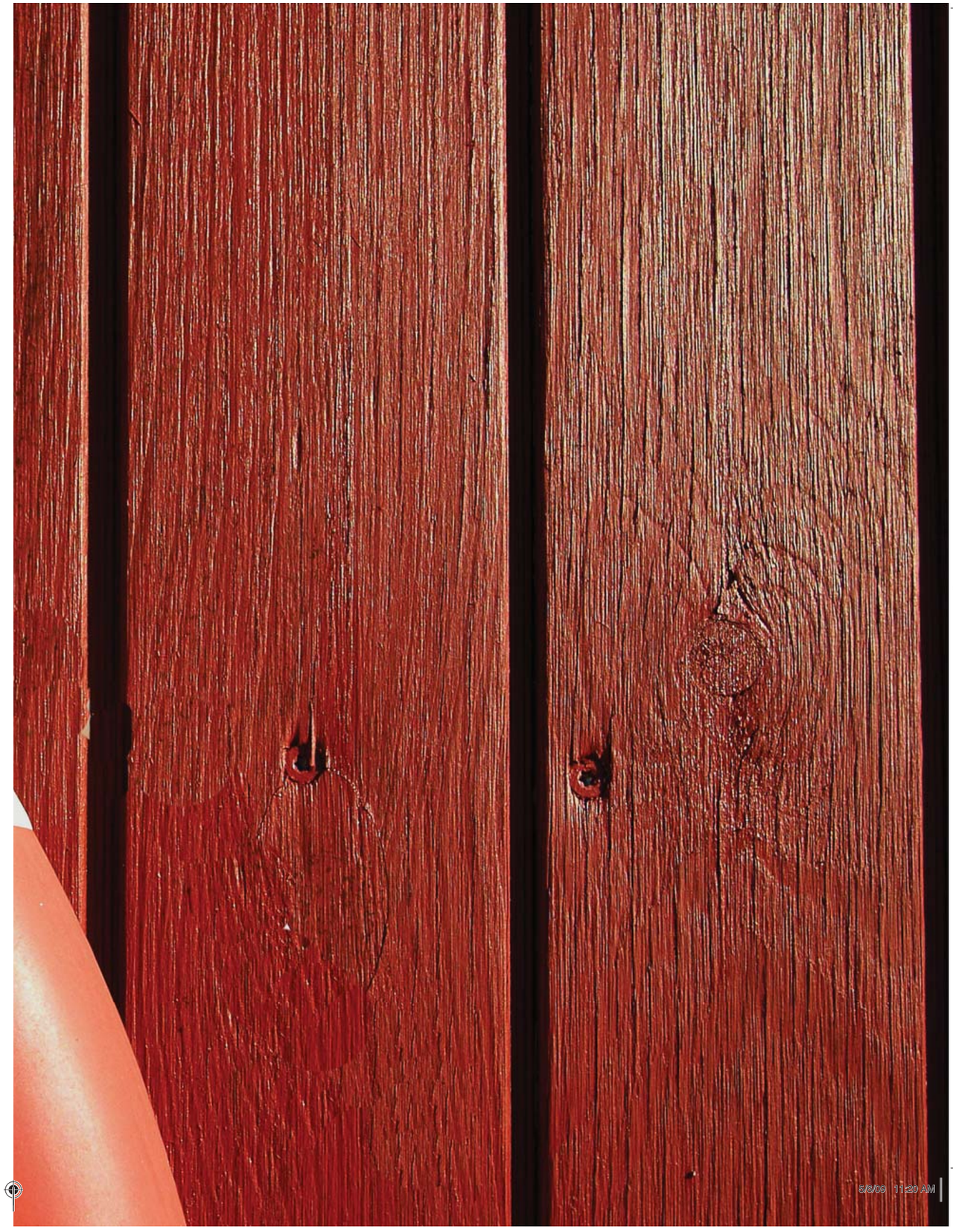

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Measures taken to save the bay

1972 the federal government passes Clean Water Act

1973 the federal government passes Coastal Zone Act

1977 the federal government passes Clean Air Act

1978 EPA launches multiyear study of the Chesapeake

1980 the Chesapeake Bay Commission is created

1983 the Chesapeake Bay program is established

actions on the bay left mostly to the states

deregulation

2009 ?

have not met the goals set by advocates, scientists or the government for the past three decades.

The Chesapeake Bay is considered by many to be the crown jewel of estuaries. Each year that the bay's health does not improve, critics of the system get more vocal. Many bay experts blame politics.

The timeline of restoration efforts shows an era of deregulation beginning in the 1980s, during Ronald Reagan's presidency.

The Environmental Protection Agency's Chesapeake Bay Program was formed in 1983. The strategy was voluntary compliance, said Leon Billings, a former delegate in the Maryland House. The government did not want to force regulations and rules on profitable industries, he said.

"They gutted the EPA," Billings said. "The new program was long on promises and targets but short on hard deadlines and accountability. You are never going to effectively deal with a multi-state pollution problem with a voluntary program."

Bay restoration is possible, but unlikely from a political sense, said Howard Ernst, author of "Chesapeake Bay Blues" and a professor at the U.S. Naval Academy.

"If people were to completely leave the area, the bay would fix itself in five to 10 years," he said. "Today, from a political and economic perspective, our elected leaders have concluded that real restoration is impractical. They would never say this, but their actions speak for themselves."

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WHAT'S YOUR TAKE?

personal testimonies from individuals who know and love the Chesapeake Bay

By Brittany Schell

There have been laws enacted, such a Maryland's famous "flush tax," which charges homeowners and industries a fee used to update the state's sewage treatment plants. The money has improved many of the treatment plants by allowing expensive technology upgrades.

Maryland's flush tax increased sewage capacity for some rural areas, encouraging development on natural lands, said Ernst. This was an unintended consequence, as preserving natural land is a vital piece of the restoration.

Money from the tax was also meant to help individuals upgrade septic systems, but few people take advantage of the funds, Ernst said. "Aside from sewage upgrades in Maryland, there has been very little positive action in the area of nutrient management," he said.

PRESERVING LAND TO SAVE WATER

Scientists have determined that in order to improve water quality to healthy levels in the Chesapeake Bay, nitrogen pollution must be reduced by 110 million pounds per year by 2010. Part of the solution is upgrading wastewater treatment plants and urban sewer systems.

Increasing the presence of natural, permeable land will also help restore the bay. Forests are the most beneficial use of land for the Chesapeake's water quality because they capture and filter water. Waterways in forested areas are in "excellent condition" and have low levels of pollution, according to a Chesapeake Bay Program report.

As a result of human development, only about half of the watershed is now forested and further development is reducing forests at the rate of 100 acres each day.

"We need to mimic nature and let that storm water back into the soil where it is filtered," said Jim Connolly, executive director of the Anacostia Watershed Society. "Mother nature knows what to do."

The bay cannot be restored to a healthy state without water that is clean, clear and rich in oxygen. But the bay and the rivers that flow into it receive too much pollution for the ecosystem to regulate itself and remain balanced.

Projections through 2030 show continued population growth and urban development in the bay area, which means more natural areas will be lost. The Chesapeake Bay will not recover unless drastic action is taken to offset the impact of human activities, experts say.

There has been an ongoing effort to combat these sources of pollution. Sewage treatment plants have been upgraded, and agricultural conservation practices implemented, but much more needs to be done.

"We all need clean water to live," Connolly said. "We get drinking water from the Potomac. We get food from the Chesapeake. Water resources are continuing to become contaminated, and as they become scarer, we are going to realize they are precious."

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The problem lies with the system,

said Fred Tutman, the Patuxent Riverkeeper. "The lawmakers are more scared of lawsuits from developers, who say they have a property right to do whatever they want on the land," he said. "They are losing water quality, but they don't care what happens downstream and who has to pay that price. It is how we deem profits, how we conduct business, how we live our lives."

This same line of thought is the reason agricultural practices remain unregulated, said Ernst — even when it is obvious that this industry is a major source of nitrogen pollution for the Chesapeake Bay.

Industrial agriculture and similar large organizations make a fortune "wrecking the bay," said Tutman. While tax payers and nonprofits are cleaning up the mess, these organizations are usually "not in the queue to help fund it," he said.

"The test of good lawmaking is that it works," Tutman said. "We have stupid laws for the Chesapeake, and we keep issuing more. That is not the solution."

Former delegate Billings expressed hope for the new administration and the focus President Obama is already showing for various environmental issues. Maybe now something will get done, he said.

HOW YOU CAN HELP

for more ideas, visit www.chesapeakebay.net/helpthebay

The actions that residents of the Chesapeake Bay watershed take everyday impact local streams and rivers and, ultimately, the bay. Here are some things you can do that the Chesapeake Bay Foundation says will help reduce harmful urban and suburban runoff:

1. Pick up after your pet
2. Install a rain barrel and rain garden
3. Plant native trees and shrubs
4. Disconnect gutters from storm sewers
5. Volunteer for a watershed group
6. Don't fertilize your lawn
7. Use phosphorus-free dish detergent
8. Don't litter, and recycle
9. Take up pavement and put in place pervious surfaces
10. Vote, and demand sound policies from political leaders