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Tainted waters

Despite a generation of efforts to clean up the Chesapeake, development and farming along Maryland's rivers still foul the bay

By Rona Kobell

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BENEDICT

First of two parts

Walter Boynton knows all there is to know about the Patuxent River - how to find its guts and marshes, where it shifts from suburban stream into bay-like vastness, when the tide is slack and when it rises.

But you don't need to be a University of Maryland biologist to see that the river is in trouble. As Boynton steers his boat underneath the Route 231 bridge near this Charles County town, a thin white film covers the water - part of a miles-long algae bloom.

He lifts a dredge from the water to examine a sample of the bottom. His crew recoils at the stench, like that of rotten eggs. Nothing is living in this muck - none of the small clams, crabs or oysters that used to make the river their home. It is the deadest part of a dead zone, with oxygen levels far below what's needed to sustain life.

"Frankly, in all my years, I don't ever remember seeing the oxygen that low here," said Boynton, 61, a researcher at the university's Center for Environmental Science. Nitrogen pollution is feeding the noxious algae, which suck oxygen from the water and suffocate creatures below.

In the 25 years since Maryland, Pennsylvania and Virginia signed a historic agreement to clean up the Chesapeake Bay, the three states and the federal government have spent several billion dollars on the effort. Yet, the bay in many respects is as bad as or worse than when they started. Maryland researchers give its water quality a score of 40 out of 100 - a far poorer grade than the 55 it got for 1986.

The degradation of Maryland's rivers is a main reason for this decline. In Anne Arundel County, bacteria and nitrogen from human waste pour into the Severn River from thousands of septic tanks. In Southern



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Maryland, development now lines the shores of the Patuxent, sending nitrogen-laden runoff into the river. On the Eastern Shore, fertilizer from farms continues its assault on the Choptank.

Maryland's leaders have long blamed other states for the Chesapeake's problems. They point out that much of the bay's pollution flows in from the Susquehanna River, largely from Pennsylvania farms. Another source is the Potomac, which meanders through Virginia, West Virginia and Washington.

But several of the bay's most impaired rivers are almost entirely within Maryland. And the blame for their precarious health, scientists say, rests squarely on the shoulders of state and local politicians who have allowed harmful land-use practices to flourish.

"I'm not worried about the pace of the cleanup. I'm worried that we're not even moving in the right direction," said William Dennison, a vice president at the Center for Environmental Science.

In 1985, the Patuxent was taking on about 14,000 pounds of sediment. By 2006, that figure had shot up to nearly 40,000 pounds, according to the U.S. Geological Survey. The nitrogen flowing into the Choptank totaled about 200,000 pounds in 1985. In 2006, the river had more than twice that amount.

The Severn and its sister rivers in Anne Arundel have fared no better. University of Maryland researchers estimate their water clarity would have scored 38 out of 100 in 1986. Twenty years later, that grade dropped to a 23.

The impact of this pollution is not simply a matter of environmental righteousness, a sense that residents of the watershed must save the bay because it's the right thing to do. A bay on the brink is a bay where people cannot swim, where boaters won't sail, where no one wants to catch the few fish still alive.

Already in the Chesapeake, watermen are pulling up pots of dead crabs from fouled water. Many kinds of fish, such as yellow perch, are largely gone from the rivers where they once spawned. Nearly every major species that once made the bay a great protein factory has dwindled - costing the region at least \$135 million in lost catch alone, according to University of Maryland economist Doug Lipton.

It is clear, scientists say, what steps should be taken to improve the bay's health. But the proposals rarely get serious consideration in Annapolis.

Environmentalists have pushed for limits on how and where new houses can be built, but home-builder groups and local governments are loath to give up control. Some lawmakers pushed for mandatory limits on farm pollution, but lobbyists and rural legislators gutted the bill. And a measure to require nitrogen-removal technology for new septic systems was dead on arrival in the Capitol.

Some in Annapolis say government is doing what it can to protect the Chesapeake. "We all treasure the bay. We all want to do the best we can to stop its deterioration. But it's difficult because all of these things cost money," said Jim Peck, director of research at the Maryland Municipal League.

Gov. Martin O'Malley argues that realistically, measures to stem pollution require consensus-building and compromise, that change takes time and is accomplished in stages that span administrations.

"It's like building a cathedral," O'Malley said in an interview, citing as part of the work several measures he

has pushed. "Each of us tries to build our piece of this activity."

But Gerald Winegrad, a former state senator who has pushed for pollution-control reforms, argues that state officials have roundly failed to take forceful action to rescue the bay. "We haven't done the bold things yet," Winegrad said. "How bad does it have to get before we get bold?"

The Severn: septic tanks

Valerie Washington comes to Bonaparte Beach every week looking for litter, pet droppings, pools of muddy runoff - anything that could influence how much bacteria is reaching the Severn River.

Gingerly, she lowers a small glass jar into the river, fills it with greenish-brown water and quickly closes the lid.

The flight-attendant-turned-biology-student will repeat this procedure at different beaches about a dozen times before noon - when the samples must be in a closet-sized lab at Anne Arundel Community College.

There, microbiologist Sally Hornor will analyze the bacteria counts and post the results on the Web. And thousands of people who live along the Severn will know whether it's safe to swim in the river.

Two days after a summer rain, the answer is a definite no. At Bonaparte Beach, the level of enterococci bacteria - sickening germs typically found in human waste - is nearly twice the amount that Anne Arundel County has declared safe. At Riverside Drive Beach, the count is three times higher than the safe threshold.

These bacteria have made the Severn - a bucolic river that was the soul of summer for a generation of Marylanders - off-limits to swimmers during certain times of the year. But they are not the only force hurting the river.

Enterococci is a close cousin of nitrogen, the bay's major polluter. Both are excreted in human waste - which flows into the Severn through the thousands of septic tanks along its banks.

In Anne Arundel County, more than 40,000 homes rely on septics, a waste management method nearly as primitive as the outhouse. The number is higher than in any other county in the state. And nearly a third of Anne Arundel's septics are along the Severn.

"We've been dumping our waste for years in this water," said Thomas H. Miller, a regional director for the University of Maryland's Cooperative Extension Service. "Our hair should be up on our back, and we should be looking at this."

In some parts of the state, septics have become a major source of water pollution. Overall, they account for only about 5 percent of the nitrogen in the Chesapeake, far less than what comes from farms and development.

But in once-rural areas such as Crownsville and Severna Park, septics are a big part of the story. They deliver more than a quarter of the nitrogen entering the Severn.

The problem isn't the flushed solids. They remain in a holding tank. But the wastewater does not. It flows - untreated - into a drain field, where it is absorbed into the groundwater and then seeps into the river. One gallon of septic waste delivers about 15 times as much nitrogen to a river as a gallon of treated sewage.

The reliance on septics along the Severn stems from the area's history as a resort community. As recently as 30 years ago, families from Baltimore and Washington summered at riverside cottages, crabbing and swimming. But when Route 97 shortened the drive, the area became a suburb. The cottages came down. In their place, newcomers put up fancy homes to live in year-round.

"The new people built a huge new house," Hornor said, "but they kept the septic system."

As whole new developments were built, they too had to rely on septics, because sewer service was never extended to them.

Anne Arundel officials didn't know how many septic systems the county had, or where they were, until about three years ago, when they began charging homeowners \$2.50 a month under the state's new flush tax.

What they found, said county public works director Ronald Bowen, was "a real eye-opener." Officials counted more than 40,000 septics. Countywide, those systems delivered an estimated 881,000 pounds of nitrogen to waterways in 2005 - compared to 747,865 pounds from treatment plants.

Bowen is convinced that all septics, whether they work properly or not, ultimately fail the rivers. He wants to extend sewage service to neighborhoods that rely on septic systems. But the county can't force existing communities to accept the service.

"We're not in a position right now to go to a community and tell them, 'We're going to make you pay. We're going to make you connect,'" Bowen said.

"But now that we have a better understanding, I think we should be looking more closely at all of our new growth. We need to recognize that, if we're going to approve new communities on septics, at the very least, they should be nitrogen-removing systems."

The Maryland Department of the Environment will cover the roughly \$10,000 cost of adding a nitrogen-removal device to septic systems, with priority given to waterfront homes. That technology would cut the pollution in half. There is funding for 600 upgrades a year. Out of 420,000 septic systems throughout the state, just 230 homeowners have used the program.

In 1999, Miller and others pushed a bill that would have required the de-nitrification systems for septics serving new homes. The measure failed amid opposition from builders and Realtors, who argued it would add too much to the cost of a new home. Since then, more than 70,000 new septic tanks have been installed in the state.

MDE officials say they don't plan to seek such legislation again. "It's our hope that there are plenty of people out there who want to do this voluntarily," said water management director Jay Sakai.

Frederick Kelly, who patrols the Severn as its "riverkeeper," believes the county and the state need to take a hard look at the septic problem. And he says that's not the only area where government is falling down on

the job.

Waterfront construction continues unabated along the Severn, allowing sediment to wash into the river despite laws designed to guard against such pollution. Like algae, the chocolate-brown dirt blocks the light that bay grasses need and ultimately kills marine life.

"They're selling these houses for \$1 million, and they're destroying the very attribute that makes them desirable," Kelly said. "The people will move here, and they'll realize there are no fish, no life."

The Choptank: farms

Tom Simpson steers his Chevrolet Suburban over the Kent Narrows bridge, then heads north of the U.S. 50-Route 301 split. Within a few miles, all trace of waterfront is gone, all the condos and golf courses left behind.

This is not the Eastern Shore the tourists come to see, with lighthouses and boutiques. This is Chicken Country, with long squat houses filled with thousands of growing birds behind waves of wheat.

Here, corn fields sit on one side of the winding lanes, green peas poke out of the soil on the other. It's a miniature Iowa, transplanted whole onto a ragged peninsula just a two-hour drive from Washington and Baltimore.

Simpson, who recently retired from the University of Maryland's agriculture college, has spent a lifetime wending his way through these lands. From his window, it's hard to believe something so lovely could be so destructive.

Yet, agriculture remains the single largest source of bay pollution.

When it rains, nitrogen and phosphorus - two of the main ingredients in both store-bought fertilizer and chicken manure - run off the fields and into creeks. Some of that pollution will reach the Chesapeake via the Choptank River, a 68-mile tributary that twists through Queen Anne's, Talbot, Caroline and Dorchester counties.

More of that pollution is reaching the Choptank now than when the bay cleanup started. Since 1985, the nitrogen flowing into the Choptank has doubled. Phosphorus and sediments have nearly tripled, according to the U.S. Geological Survey, which monitors the river near Greensboro.

Some of that can be attributed to all the new pavement and sewage treatment plants that have come with the Delmarva Peninsula's growth. But much of it still comes from farms.

"The farmers are shooting for the best yield they can get, and in the process, they leak nitrogen," Simpson said. "It's frustrating to me, because these are good people. But they're dealing with the expectation of the market."

Unlike septic tanks, farm pollution has been the subject of much discussion in Annapolis over the years. But no one seems eager to regulate farmers, who are seen as salt-of-the-earth good guys. Aesthetically, many

people would rather see a farm by the side of the road than the townhouses that could come if the owner sold the land. The O'Malley administration has proposed new rules to govern the storage and handling of manure by Maryland's largest chicken growers, but the regulations would not affect most farmers who use manure as fertilizer.

"You can take chicken manure and agricultural waste and drop it with impunity," said Winegrad, the former state senator.

The problem is that farming and conservation are fundamentally at odds. Farmers want to plant - and thus fertilize - every acre of land because that is how they make money. The bay is better served if they leave some fallow, particularly near water.

Government programs have tried to close the gap by paying farmers to plant buffers and cover crops to soak up excess fertilizer. But often, the funds aren't enough, said Jeffrey Lape, executive director of the Chesapeake Bay Program, the federal-state agency overseeing bay cleanup.

"It's tough to walk out to a farmer struggling to get by and say, 'You know, I think you need a bigger buffer,'" Lape said. "He'll look at me and say, 'You have just killed my profit margin.'"

Maryland's approach has been to urge farmers to voluntarily use conservation practices and, as an incentive, to pay them for taking certain steps. The successes - and limits - of this approach are evident on John Hammer's 362-acre farm in Greensboro.

From a scientist's perspective, Hammer is doing a lot right. He doesn't till his soil. He's planted a grass strip between his chicken houses to absorb runoff, as well as a tree buffer to protect the river. He pays a consultant to help write a "nutrient management plan" to calibrate just how much fertilizer he will need. He says he follows the plan to the letter.

Despite the care he takes, Hammer, like many farmers these days, is depending more on chicken manure to fertilize his beans and corn. He gets the manure for free from the chickens he raises, making it far cheaper than buying fertilizer.

Manure has a hidden cost, however. It is loaded with phosphorus, a chemical that has proved toxic to bay life. To get the nitrogen they need from the manure, farmers end up applying more phosphorus than the soil can ever absorb.

Less pollution would run off Hammer's fields if he planted cover crops - crops intended solely for the purpose of absorbing nutrients left in a field after the cash crop is harvested. But Hammer says he needs to keep his fields planted with a fertilized cash crop, green beans. A state program would reimburse him for part of the cost of planting cover; it would not compensate for lost profit.

This year, the state will pay farmers \$18 million to plant cover crops - more than three times what it spent two years ago. The extra money is meant both to reach more farmers and to pay them more.

Some environmental groups say more money is not enough. They say the state needs a tough new law on nutrient management plans, enforced by the Maryland Department of the Environment instead of the farm-friendly agriculture department, to force farmers to limit fertilizer use. Environmental inspectors could visit

a farm, test the soil, and determine if a farmer was applying more phosphorus than his plan dictated. That way, they could force a farmer to get in compliance and issue stiff fines if he didn't.

But farmers, who often teeter on the edge of profitability, say they need flexibility to manage their land. Many have threatened to sell to developers if tough new mandates come to pass.

Winegrad, at least, is willing to take that chance.

"I have challenged people to show me a major achievement in the history of the United States through a voluntary program," Winegrad said, "and no one has ever found one."

The Patuxent: growth

For a time, the Patuxent River looked like it would be the bay cleanup movement's success story - a river rescued from certain death by a band of Southern Maryland activists.

Three decades ago, they sued to force the state and federal governments to stop allowing pollution to be dumped into their river by sewage plants serving Baltimore and Washington. Eventually, the plants were fixed - and the Patuxent rebounded. Bay grasses were so plentiful that children pulled them up to make wigs. When the locust blooms came in spring, the crabs ran once again.

Bernie Fowler couldn't believe it. The genteel fellow who made his living renting out rowboats on tiny Broomes Island was witnessing the rebirth he had dreamed about. "I was just so happy, I was jumping up and down for joy," said Fowler, now 84, who as a county commissioner helped lead the lawsuit. "I figured we had turned the corner."

Today, the Patuxent is tied with the Severn and other Anne Arundel rivers for the most polluted in the Chesapeake Bay. Algae blooms, like the one Boynton found near the Route 231 bridge, are common. Large portions of the river are a muddy brown, the result of sediments pouring in from development. Even in rural parts, there are no grasses left and hardly any crabs.

The river is dying. And this time, Patuxent activists can't blame the urban counties upstream. Southern Maryland has become part of the problem.

Tens of thousands of people have moved to Calvert County alone. Its miles of beautiful shoreline have become home for people like Burt Lahn, a career Coast Guard employee who rises at 4 a.m. each day to catch a bus to Washington. The former Howard County resident says his three-hour commute is worth it. "This is the paradise I was looking for," said Lahn, who lives in one of Broomes Island's new homes.

Lahn's neighbor, Bruce Pitt, bought a lot on a one-time strawberry field when his family outgrew their house in Virginia. The IT consultant says he likes being within driving distance of the Washington area, where he has many clients.

"The people are nice down here," he said. "I've got six kids, and this is a great place for them."

Thirty years ago, Calvert County had 20,000 residents. Today, it has nearly five times as many. Traffic has

tripled on Route 4, the county's spine. Residents are not only driving to Washington. Many go south to the Patuxent Naval Air Station, which now employs more than 17,000 people.

The problem isn't just that the county grew, but how it grew. In the 1980s, Calvert zoning rules limited builders to one house per 5 acres in rural areas. Contractors rushed to carve up farms and forests into developments that - because of the big lots - destroyed huge swaths of open space.

"The way they were building, they were consuming a tremendous amount of land," said Karen Edgecombe of the Chestnut Trails Land Trust, a local land conservation group.

Along the water, new residents sheared away trees to build mansions, piers and decks - violating the spirit, if not the letter, of Maryland's 1984 Critical Area Law. The law does not prohibit building along the shoreline, but it does limit how close to the water and how much of a footprint a house can have.

Calvert County now has dozens of shopping centers, too, filled with Chinese restaurants and Curves gyms. They have risen from the forests where Fowler and his friends used to hunt for quail, and the river is the poorer for it.

The forest acted as a sponge to absorb nitrogen. The newly paved surfaces are more like a chute, carrying what runs off the land into waterways. Rain picks up fertilizer from lawns, as well as nitrogen from exhaust pipes and deposits it into the Patuxent and, later, the bay.

During the past couple of years, Calvert County officials decided they needed to slow the onslaught. They have changed rural zoning to one house per 20 acres - a standard so stringent officials say they hope it will channel development to town centers, as Smart Growth principles suggest.

Calvert is the only Maryland county to announce that it will cap growth, allowing no more than 37,000 homes to be built. With just fewer than 31,000 now, planning director Gregory Bowen expects to approach the cap by 2030.

Bowen cautions that the policies will lead to change only over time. New laws "don't affect the development you see today. They affect the development you see some time from now," he said.

Patuxent activist Jennifer Bevan-Dangel said the early sprawl persuaded Calvert residents that they needed growth controls. Though developers dislike the cap, she applauds it.

"Everyone's watching Calvert County and wondering, 'Will this work?'" she said.

The rest of the area, she said, hasn't followed suit. Sprawl continues to spread in St. Mary's and Charles counties.

Even if Calvert's new policies help the river, old-timers know they can never bring back the ambience of villages like Broomes Island - places where everyone knew each other by the sound of their boat motors.

From his porch, Hezekiah "Duck" Elliott can still see the locust blossoms in the spring. They no longer signal that the crabs are running; even if they did, hardly any watermen are left to notice. Elliott, 81, works only part time. Most others have long since retired.

He is doubtful that decades of damage can be undone. "If you get the grasses back, you'll get the crabs back, and the minnows back," Elliott said. "But how are you going to get anything back?"

The bay: 'bad water'

All that pollution from Maryland's rivers eventually makes its way to the Chesapeake. Pat Norris knows that all too well. This summer, the veteran waterman steered his workboat to a spot off Point Lookout, near Maryland's southern tip, where he had set his crab pots. He pulled them up to find they were filled with dead crabs.

Norris has worked the bay for nearly 20 years, and he has long known about "bad water" - oxygen-deprived swaths where little can live. But this was the first week in July. He had never seen bad water so early, or in so many places.

"It's disheartening," he said, "to say the least."

During the past 25 years, several billion dollars in state and federal funds have gone to bay cleanup programs. A large chunk of that - including money from Maryland's landmark flush tax - has paid for improvements to sewage treatment plants. Other money has gone to farmers to plant cover crops and conserve land.

Environmental experts say those steps have helped to hold the line - that the bay would be in even worse shape without them. But it has not gotten better.

Population growth is bringing increased pavement to the landscape, as well as increased loads to treatment plants. Treated wastewater is cleaner than it was a decade ago, but there's more of it. Farms remain the bay's single biggest polluter.

No one is suggesting that governments halt development or outlaw farming. But many environmentalists say that officials in the six-state watershed - especially Maryland - could do much more to stop pollution from development and farms, not just pay to clean it up.

"Every politician will say, 'I'm for the Chesapeake Bay.' But when it comes time to vote, they won't protect it," said Kelly, the Severn riverkeeper. "It's just not a high enough priority. There's no political will."

tomorrow

Politics has failed Maryland's rivers, as farmers, homeowners, developers and local government have thwarted reforms.

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