



Watermen Blues

Economic, Cultural and Community Impacts of
Poor Water Quality in the Chesapeake Bay



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Executive Summary

More than 25 years since the Chesapeake Bay Agreement of December 1983 created a region-wide partnership “to improve and protect the water quality and living resources of the Chesapeake Bay,” the bay’s water quality has not improved, and communities that rely on a clean, sustainable bay are paying a high price for the lack of progress.¹

Pollution is a major cause of the bay’s problems. Fertilizer-laden runoff from farms and lawns, as well as discharge from sewage treatment plants, flows into the bay. This fuels algae blooms, using up oxygen in the water and creating unnaturally large dead zones—areas where dissolved oxygen levels in the water are so low that aquatic creatures flee or die. Sediment from farms, roads, and construction sites further pollutes the bay.

This pollution creates multiple problems, including:

- Low dissolved oxygen levels. All of the bay’s waters should

meet state standards for dissolved oxygen. But dissolved oxygen levels are worse today than they were 10 years ago, when 30 percent of the bay’s deep areas met the dissolved oxygen goal of at least 5 parts per million. From 2006 to 2008, only 16 percent met that goal.²

- Depleted underwater grasses. The grasses, which provide important shelter for young fish and crabs, need sunlight to survive, but pollution-fed algae blooms block the light. A healthy bay would have 185,000 acres of underwater grasses; in 2008, it had slightly less than 77,000 acres of this critical habitat.³

Pollution is not the only reason for the fisheries’ decline. Other factors, such as overfishing and competition from foreign imports, are also involved.⁴ But low oxygen levels and the lack of underwater

grasses harm the bay's commercially valuable fish and shellfish in several ways:

- The dead zones kill bottom-dwelling organisms that are food for fish and crabs.
- Dead zones often kill crabs in their traps and limit the areas where watermen can catch crabs.
- Dead zones force striped bass to leave the cool, deep water they prefer and into warmer water, which stresses their bodies, making them vulnerable to disease.
- Without underwater grasses to hold bottom silt in place, sediments move into the water column. Oysters suffocate under layers of silt, and too much sediment in the water column may weaken oysters so much that they cannot fight off lethal diseases.

Historically, the bay supported commercial fisheries for oysters, soft shell clams, blue crabs and striped bass. The oyster and soft shell clam fisheries have collapsed. Since 1990, low catch limits designed to protect the striped bass population have severely restricted the ability of watermen to harvest this species.⁵ Crab harvests have fallen so steeply that in September 2008, the U.S. Secretary of Commerce declared the Chesapeake

Bay commercial blue crab fishery an economic disaster.⁶

As commercial harvests fall, people and communities are suffering economic hardship, social upheaval and the loss of cherished traditions.

- A Tilghman Island waterman built a seafood company that employed 100 clam- and oyster-shuckers. But after those two fisheries failed, the business shrank by four-fifths.
- After the dead zone in the Chesapeake made it too difficult to catch live fish, a Chincoteague-based gill-net fisherman no longer fishes in the bay.
- The women entrepreneurs of Smith Island are struggling to keep their crabmeat cooperative alive in the face of low harvests. Former co-workers, relatives and friends have left the island to work on the mainland as truck drivers or prison guards.
- A seafood company on the Rappahannock River ships less and less fish to wholesale fish markets because watermen are catching fewer fish.
- A bay community near Blackwater National Wildlife Refuge supported six grocery stores 15 years ago. Now it's

down to one grocery, and this summer the owner laid off an employee for the first time.

- A ship's carpenter has trained dozens of apprentices in the art of restoring the bay's iconic skipjacks, but the apprentices have all left the bay area to work in museums.
- The owner of the oldest working skipjack on the bay can no longer make a living as a waterman. Instead, this third-generation waterman runs sailing trips for tourists, and grieves that his two sons have "gone to carpenters."

Economists say the bay's commercial fisheries are on the verge of

extinction.⁷ Healthy fisheries and healthy fishing communities are vital parts of the Chesapeake Bay region's economy and heritage. To restore the health of the bay, federal and state governments must:

- Strengthen limits on agricultural pollution, particularly related to large poultry and livestock operations.
- Cut pollution from new and existing developments.
- Provide adequate funding for wastewater treatment plants to meet a best available control technology standard.
- Fully enforce pollution limits for all polluters.

The Chesapeake Bay's Fisheries and Economy Are in Decline

The Chesapeake Bay's watermen have been a mainstay of the Mid-Atlantic economy for generations. From the 19th century onward, their harvests made historically significant contributions to the U.S. seafood supply. Their skills, customs, and lore, along with the fish and shellfish they provide, are fundamental to the Chesapeake Bay region's identity.

As a tangible asset, commercial fisheries are less important to the regional economy than they were 100 years ago. But a healthy commercial fishery, as a sign of a healthy bay, may well be one of the region's most important intangible assets in the 21st century.

More than 25 years ago, the federal government forged a novel partnership with Maryland, Virginia, Pennsylvania and the District of Columbia to restore the nation's largest estuary. In the Chesapeake Bay Agreement, signed in December 1983, the region's political leadership pledged "to improve and protect the water quality and living

resources of the Chesapeake Bay." But the bay's water quality has not shown any lasting improvement, and its living resources are in far worse shape than they were when the bay restoration program began. The bay's major commercial fisheries have collapsed or been sharply restricted. Twenty-five years of weak pollution regulations and piecemeal fishing rules have failed to halt the downward spiral.

One by One, Fisheries Have Failed

In 1983, the bay supported four major commercial fisheries: oysters, soft shell clams, blue crabs and striped bass (known locally as rockfish). Watermen could rotate among these four fisheries, according to the seasons of the year. This flexibility protected them from economic hardship in years when one of the staple species was scarce,

and reduced the likelihood that any one species would be overfished.⁸ But the soft shell clam and oyster fisheries have collapsed, and the commercial harvest of striped bass has been restricted to allow the fishery's survival. Crab harvests have fallen so dramatically that in 2008 the federal government declared the fishery a disaster.

Twenty-five years ago, the oyster harvest was the bay's most important commercial fishery, as it had been since the end of the Civil War. But in the 1980s two parasitic diseases, MSX and dermo, virtually wiped out the bay's oysters.⁹

Oyster harvests plunged at a staggering rate. In 1973, Maryland's oyster harvest was 20.4 million pounds, but 20 years later

it was about one-fourth of that. The all-time low came in 2003, when Maryland oystermen harvested only 174,000 pounds worth \$785,000.¹⁰ (Virginia declined to provide oyster harvest data for this report; Virginia Marine Resource Commission spokesman John Bull said Environment Maryland's request led the agency to discover errors in its harvest records.)

Next, the bay's soft shell clams suddenly died off. This valuable fishery provided clams for the New England "steamer" market. The commercial soft-shell clam harvest went from 250,000 bushels a year in the late 1980s to almost zero today.¹¹ The near-elimination has been linked to a parasite, but scientists say a series of ecological



Striped bass. Credit: Richard Grunion, istockphoto.com

changes probably were involved. “As with most other bay species, no single event or causative factor can be rationally put forward” to explain the collapse, wrote scientists at the Maryland Department of National Resources in a February 2009 study.¹²

These two shellfish species provided watermen with a steady source of income, especially in the winter months, according to Larry Simns, president of the Maryland Waterman’s Association. “Fish come and go. You can’t count on them,” Capt. Simns said, but “the oysters and clams was the backbone of the watermen.”¹³

At about the same time, falling striped bass catches caused Maryland to impose a moratorium on commercial and recreational fishing for stripers from 1985 to 1990. In 1989, Virginia imposed a one-year moratorium. When it was lifted, both states set harvest levels much lower than they had been as part of a coast-wide management plan for the fishery.¹⁴ Last year, watermen harvested a combined 3.8 million pounds of striped bass worth \$6.6 million.¹⁵

The loss of the oyster, soft shell clam and striped bass fisheries meant that watermen fished for crabs more intensely than ever. In 1984 the combined Maryland and Virginia harvest was more than 94 million pounds. In 2003 the harvest fell to 47 million pounds. The nadir came in 2007, when the two states’

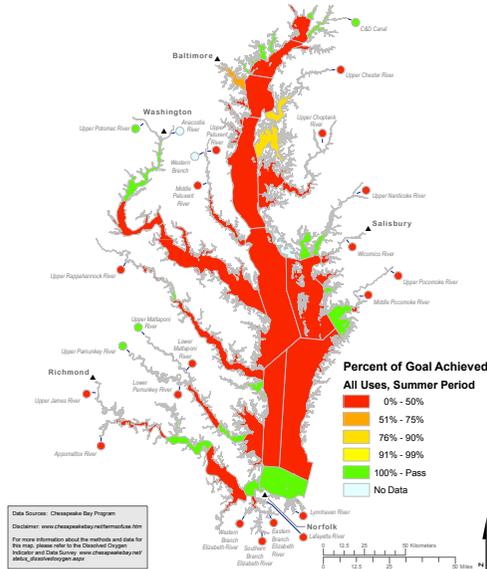
watermen harvested just 32 million pounds, roughly one-third what they caught before bay restoration efforts began. In spite of rising prices that spelled the end of many families’ traditional “crab feasts,” the value of the 2007 harvest value fell to \$41 million, about 40 percent less than it had been just a decade before.¹⁶

In May 2009, the U.S. Secretary of Commerce officially declared the Chesapeake Bay commercial blue crab fishery a failure, and an economic disaster. The declaration meant that the states qualified for a combined \$20 million in federal disaster funds.¹⁷

Deep Waters Have Become Dead Zones

In the early 1980s, EPA scientists helped focus public attention on the bay’s low levels of dissolved oxygen, which turned large areas into underwater deserts where aquatic creatures could not survive.¹⁸ Low dissolved oxygen can occur naturally, but water pollution makes it more severe. Water flows from farm fields and city streets, or is discharged into the bay after sewage treatment, carrying an overdose of nitrogen, a natural fertilizer. The nitrogen fuels algae blooms, which use up oxygen in the water. When oxygen levels fall below five parts

Figure 1. Most of the Chesapeake Bay Fails to Meet Dissolved Oxygen Goals in the Summer



Chesapeake Bay Program, *Dissolved Oxygen (June-September, 2006-2008)*, downloaded from www.chesapeakebay.net, 27 August 2009.

per million, fish and shellfish usually leave the area. At lower oxygen levels, “dead zones” form and fish and shellfish suffocate.

Concern about the dead zones was one of the driving forces behind the Bay Agreement. In the 1980s, up to 40 percent of bay’s waters had oxygen levels below five parts per million in the summer. The Chesapeake Bay Program’s restoration goal calls for 100 percent of the bay’s waters to meet state standards for dissolved oxygen, as required by EPA. Achieving this goal is important to successful restoration.¹⁹

But the trend is headed in the wrong direction. In 1999, measure-

ments taken in deep water, where oxygen levels are normally lower than at the surface, found that 30 percent of the bay’s deep areas met the dissolved oxygen goal of 5 parts per million or more. The Chesapeake Bay Program’s most recent analysis shows that from 2006 to 2008, only 16 percent of the bay’s deep waters met the goal.

Low oxygen levels can reduce a waterman’s catch by killing crabs, oysters and fish. Oxygen levels sometimes change so quickly that blue crabs suffocate in watermen’s traps. Unhealthy oxygen levels also limit the areas where watermen can fish. Bay crabbers no longer set their traps in deep water, because

crabs don't stay in these low oxygen areas. Today, almost all the bay's crab traps are in 10 feet of water or less.²⁰

Most important, low oxygen levels can kill organisms that form the base of the bay food chain. Robert Diaz, a Virginia Institute of Marine Sciences (VIMS) expert on dead zones, estimates that low oxygen levels cause the bay to lose 11,000 tons of shellfish and worms annually. These bottom-dwelling creatures are essential food for fish and crabs. The loss means that five percent of the bay's total energy is wasted, primarily because of water pollution.²¹

In a study published in the journal *Science* in April 2008, Dr. Diaz and a co-author concluded that low oxygen is "a key stressor" of bay fish and shellfish. They found that low oxygen dead zones do at least as much harm to bay stocks as overfishing, the loss of bay grasses, and harmful algal blooms.

Wolfgang Vogelbein, a VIMS expert in fish diseases, links low oxygen levels with a chronic disease called mycobacteriosis that afflicts more than 75 percent of the bay's striped bass. In summer, striped bass seek out the cool, deep water of the bay's main channel. But oxygen levels there are so low that the stripers can't survive, so they're forced into the shallows. Dr. Vogelbein found that the much warmer water there stresses the stripers' metabolisms, much

as scorching heat affects a human being. Trapped in this inhospitable environment, the striped bass become more vulnerable to this disease, which can kill infected fish.²²

Researchers at the University of Maryland's Chesapeake Biological Laboratory and at VIMS have found that low levels of dissolved oxygen also make oysters more susceptible to other diseases.²³

It is difficult to track the connection between dissolved oxygen and actual seafood harvests in the real world. But one research team used oxygen readings taken from Chesapeake Bay Program sensors in the Patuxent River and compared that to catches by watermen trotlining for blue crabs in the river. The researchers used this data to estimate the effects of low oxygen on Patuxent River crab harvests. They found a drop in oxygen levels from 5 parts per million to 4 parts per million could reduce the trotliners' harvest by 48 percent. The study was published in the journal *Estuaries* in April 2003.²⁴

Douglas Lipton, a University of Maryland economist and member of the research team, said more research is needed on the effects of low oxygen levels on commercial seafood catches. "It's very complicated. These things are all linked together, in ways that we don't fully understand," Dr. Lipton said.²⁵

Scientists know that pollution is partly to blame for the loss of more

than 100,000 acres of underwater grasses. Most of the bay's commercially valuable fish and shellfish rely on healthy grass beds for survival. The grasses add oxygen to the water as they photosynthesize. They shelter young fish and crabs from predators. Their roots hold the bottom sediments in place, improving water clarity and preventing bottom-dwelling creatures like oysters from suffocating under a layer of silt.

But pollution fuels algae blooms, which cloud the water column, preventing sunlight from reaching the bottom. Without sunlight the grasses die, and once their roots are gone, sediments are more likely to bury the oysters. And the decay of algae after the bloom has ended lowers the amount of dissolved oxygen in the water.

With protection from sediment, oysters can survive apparently unharmed by diseases (provided oxygen levels are sufficient), according to an experiment reported in July 2009 in the online journal *Science Express*. Researchers at the Virginia Institute of Marine Science built nine artificial reefs in the Great Wicomico River in 2004, and waited to see whether oysters would grow there. In 2007 they found 185 million apparently healthy oysters on the reefs. "This reestablished metapopulation is the largest of any native oyster worldwide," the scientists reported.²⁶

Oysters growing on the bottom

are like "a sick smoker in a smoke-filled bar," not healthy enough to fight off diseases, researcher David Schulte told *The Washington Post*. But freed from the sediments, they are "marathon runners taking a nice jog in the mountain air, and it does make them significantly healthier."²⁷

While it is probably impractical to build artificial reefs throughout the bay, the findings point to the benefits that improved water quality could bring. The Bay Program's goals call for 185,000 acres of grasses in a healthy Chesapeake. There has been some progress from 1984, when the bay had about 38,000 acres of grasses, to 2008, when there were nearly 77,000 acres. But the underwater meadows that provide critical habitat for crabs in the lower bay have not grown in the last ten years, and the grass beds in the middle bay have decreased about four percent. The Bay Program is only 42 percent of the way to its goal for bay grasses.²⁸

Marylanders Have Lost Their Livelihoods

As harvests fell, the number of watermen also fell sharply. In 1993, authors Tom Horton and William M. Eichbaum estimated there were 14,000 working watermen on the Chesapeake Bay. By 2003, the number had fallen to 10,000. Most of

those were inactive or part-timers.²⁹

Since watermen now rely so heavily on blue crabs, the number of blue crab license holders may be a better measure. In 1999, Dr. Lipton and two other economists found there were about 4,800 watermen licensed to harvest blue crabs. Slightly less than half of those were full-time crabbers.³⁰ In 2006, VIMS fisheries economist James Kirkley estimated that there were about 3,100 remaining crabbers bayside.³¹

After a detailed survey of Virginia's fishing industry from the mid-1990s to 2004, Dr. Kirkley found a "dismal picture": The value of Virginia's seafood harvests fell by 30 percent, and most of the harvest had shifted from the Chesapeake Bay to the Atlantic Ocean.

By 2004, more than two-thirds of Virginia's seafood income came from sea scallops, an ocean species. Commercial fishing provided about 3,900 jobs in Virginia in 2004, but only about 1,300 of those were in Chesapeake Bay fisheries. And nearly 300 of those workers worked for one company, which processes menhaden.³²

"Once you pull menhaden and sea scallops out, we don't have a (commercial) fishery any more," Dr. Kirkley said. "Landings in Virginia are declining really severely. We're on a downward path."³³

Capt. Simns said Maryland's watermen are turning to other jobs. "They cut grass in the summer, they work in marinas. A lot of them own tugboats. A lot of people in Smith Island and Crisfield are



Crab pots stacked on a dock. Credit: NOAA.

working in the prison down there (Eastern Correctional Institution) in Somerset County,” he said. “It’s not what they want to do, but it’s what they’ve got to do.”

Most of these new jobs do not pay enough to support a family and cover the cost of maintaining the fishing boats the watermen already own, Capt. Simms said. The fortunate ones are those who’ve simply stopped insuring their boats. “They’ve got the dead expense of the boat sitting there and they’re taking a gamble that nothing happens to it. They can’t afford the insurance on the boats with a job paying \$15 an hour.”

Some others are facing foreclosure on their boats or their homes, he said. “I get phone calls all the time from people in trouble, and I can’t tell them nothing,” he said. “I don’t know the answers.”³⁴

Recreational Fishing and Boating Are an Unreliable Substitute

Some recreational fishing organizations think the bay states should recognize that commercial fishing is on the wane and grant exclusive fishing rights to anglers for some species, especially striped bass. In 2005 one anglers group commissioned a study by Southwick Associates, a research firm specializing

in fish and wildlife economics, comparing the economic impact of commercial and recreational fishing.

The Southwick study found that in 2003, recreational fishing trips in Maryland and Virginia created \$470 million in sales and more than 9,000 jobs. When the impact of recreational fishing on other businesses was included, the industry brought in a total of \$889 million. Commercial fishing for striped bass that year earned just \$7.2 million in sales, created just over 2,000 jobs and generated a total of \$97 million for the two states’ economies. Consumers could buy a pound of striped bass in a fish market for \$6.09, the study found, or they could spend \$105.10 a pound to catch their own.³⁵

But another Southwick study, this one commissioned by the state of Maryland, found the recreational fishing industry is in decline. That study looked at the sales of recreational fishing licenses in recent years and found across-the-board sales declines.³⁶

“Over the past five years, Maryland’s total number of buyers has decreased by eleven percent,” Southwick reported in 2006. “Sales decreases are nearly uniform across all segments, indicating a public shift away from purchasing licenses and likely away from fishing over the past five years.

“The most significant finding in this study is likely the percentage

of anglers who buy a license every year,” the report continued. “Over 73 percent of license customers are not loyal customers and bought only once or twice over the past five years. These people are finding other ways to spend their free time each year. Fishing license sales, and fishing, face competition from other activities and are not doing well.”

Gina Hunt, Maryland DNR’s deputy director of fisheries, said recreational fishing license sales have continued to drop since the Southwick study. The decline of the national economy, higher fuel costs, rockfish consumption advisories, and higher fees all contributed to a “significant” drop in 2008, Ms. Hunt said.

But the larger issue is a consistent, nationwide “downward trend” in recreational fishing, she said. “People have other things to do. Adults are playing golf. Kids are playing video games. People just don’t do those outdoor things like they used to.”³⁷

Capt. Simns said some former watermen turned to charter fishing, but found they could not earn a living at it.

“Everybody that has a boat fit for running parties has started running parties a few years back, because you can’t make any money doing anything else,” he said. “But that’s all dried up. When people ain’t got no money they don’t spend on fishing parties.”³⁸

Heritage Tourism and Heritage Seafood Provide Some Relief

Some economic development experts say the bay’s waterfront communities should switch from fishing to “heritage tourism,” such as boat trips, bus tours and attractions that offer a glimpse of the waterman’s way of life as it was 20, 50 or 100 years ago. Capt. Wade Murphy said the switch is not an easy one, and not one that all watermen can successfully make.

Capt. Murphy now runs sailing trips aboard a skipjack that was a working oyster dredger for nearly 100 years. “The hardest part of this job is working with people,” he said. “It ain’t what a waterman is used to. Some can do it, and some can’t.”³⁹

Capt. Murphy, 60, said he earns an adequate living to support himself and his wife, but could not raise a family or send his two sons to college, as he once did on a waterman’s income.

Data collected by Maryland’s Midshore Comprehensive Economic Development Strategy Committee found the tourism and hospitality industry paid the lowest wages in the three-county region in 2005, ranging from a low of \$197 per week in Caroline County to \$365 per week in Talbot County. Earnings in the natural resources sector ranged from \$420 a week in Caroline County to \$720 in

Dorchester County, the region's crab harvesting and processing hub.⁴⁰

Heritage tourism may not be able to match the earnings watermen once enjoyed, but Christine Smith believed the waterman's heritage has economic value all the same. Mrs. Smith, who passed away in August 2009, was president of the Smith Island Crabmeat Co-operative, a group of waterman's wives who work together to pick the meat from the crabs their husbands and sons catch and market it as lump crabmeat.⁴¹

The Smith Island co-op has been hard-pressed to get an adequate supply of crabs, but their distributor

“says he can't get enough of it, so many people want it,” she said. On a recent visit to Baltimore, Mrs. Smith visited Wegman's Market in Hunt Valley, which sells most of the crabmeat the co-op produces. She was surprised and pleased to see their crabmeat was selling briskly, even though it was priced \$3 per pound higher than packaged crabmeat shipped in from Louisiana.

“We have a reputation for the cleanest, whitest crabmeat you can find,” Mrs. Smith said. “People know we're authentic and we're doing it right. And even in hard times some people will pay more for that.”

How the Declining Health of the Bay Hurts Marylanders

When a waterman can no longer earn a living by harvesting crabs and oysters, the ripple effects are wide. The waterman feels the direct effect; he loses his livelihood. The ship's carpenter who repaired his boat is indirectly hurt. He loses a customer, and if enough watermen stop fishing, he may lose his job. The grocer who used to sell both men coffee and sandwiches watches his profits fall and has to lay off an employee. The employee's children will not get new back-to-school clothes this fall. The ripples keep spreading.



Shucking oysters. Credit: Bill Thompson

Eventually the entire community suffers when the Chesapeake Bay can no longer produce the bounty that made it famous.

The following case studies are real life examples of what polluted water and declining fish populations mean for Maryland.⁴²

Watermen Can't Earn a Living: Russell Dize

Russell Dize was a Chesapeake Bay waterman for nearly fifty years. The first thirty years or so were pretty good.

"The day after I got out of high school, I caught fifty bushels of oysters," said Mr. Dize, a third-generation waterman. "I was a hard worker. I did alright."

He started a clam shucking operation in the early 1970s. "We used to shuck 600 bushels a day, 400 on

the day shift and 200 at night,” he said. Later he and a partner started a new business, RDF Seafood, which employed 75 clam shuckers and 25 oyster shuckers. Fifteen boats kept the company supplied with shellfish.

Mr. Dize continued working as a waterman, dredging for soft shell clams, the “steamer clams” so beloved by New Englanders. Mr. Dize’s harvests were usually plentiful.

“We were pretty ignorant,” he said. “We had it great and we didn’t know it. My God, you couldn’t have it any better than we did. Now we’ve lost the oysters. We lost the clams. All we’ve got left now are crabs and rockfish. If we lose them, we’re sunk.”

Mr. Dize and other watermen say the turning point was in 1972, when Tropical Storm Agnes loaded the bay with sediment and nutrients that blocked light from reaching the bottom. Within a year, he said, almost all the underwater grasses near his home on Tilghman Island were gone. The result was a decline in the abundance of creatures that depend on the grasses for shelter—from shellfish, crabs and juvenile fish to ducks and other water birds.

Still, watermen were able to maintain their traditional cycle, crabbing in summer, dredging for oysters and crabs in winter, and bridging the seasons with catches of rockfish and a variety of smaller fish.

The next blow came around 1992, when the soft shell clam harvest in Maryland waters plunged from an average of 170,000 bushels a year to 25,000 bushels.⁴³ Within a decade the valuable clams were so scarce that watermen stopped trying to harvest them. In 2007, the bay’s soft shell clam harvest was zero.

There is no definitive explanation for the soft shells’ sudden disappearance. “As with most other bay species, no single event or causative factor can be rationally put forward as to why soft shell clams, at one time the most abundant, large forage mollusk in the Maryland portion of the Chesapeake Bay, are now a remnant species,” wrote three state scientists in a February report that summarized more than ten years of research.⁴⁴

Mr. Dize blames pollution for creating “dead zones” of low oxygen on the bay bottom. Clams, which burrow into the sediment, cannot escape low oxygen levels as quickly as fish and crabs can. But whatever the cause or causes, the state scientists wrote, the soft shells’ disappearance deprived other bay creatures of an important food source and probably caused ripple effects throughout the entire bay food chain. The prospect for soft shell clams’ recovery is “gloomy,” the scientists wrote.

Mr. Dize’s company switched from clams to oysters. “We would buy as many as 1500 bushels a day,”

he said. “They’d be shucked and shipped out in gallon cans.” Diseases were beginning to wipe out oyster colonies in Virginia’s saltier portion of the bay, but the diseases seemed to be unable to move into the Middle Bay. That changed in the mid-1990s, and Maryland’s oysters also began dying.

Like other watermen, Mr. Dize believes the oysters were already under stress from water pollution, which made them more vulnerable to disease. “It’s hard to get your hands around it,” he said. “We don’t know how much pollution has caused our fisheries to collapse.

“But let me put it like this. Take away all the pollution and then we’ll get the grasses back and then we’ll have oxygen in the water again. No more dead zones. No more crabs suffocating to death in the traps.”

In 2007, after heart bypass surgery, Mr. Dize sold his company, which employed about one-fifth as many workers as it had in the 1980s, sold all but two of his seven fishing boats, and retired.

Today he takes tourists out on crabbing charters. The visitors don’t know how much clearer the water used to be, he said.

Over the past 25 years, Mr. Dize said, bay pollution has gotten worse. “Until they do the things they have to do to stop runoff in the bay, and stop letting sewage plants use the bay as a dumping ground when they flow over, you’ll never have any bay restoration.”

Watermen Are Leaving the Bay: Ernest Bowden

Waterman Ernest Bowden used to earn a good part of his living fishing the Chesapeake Bay, as his ancestors did for hundreds of years. But pollution forced him to give it up.

“The water quality’s not there. The fish are not there any more,” said Mr. Bowden, a gill-net fisherman who lives in Chincoteague, Virginia. “It really just wasn’t worth my time.”

Mr. Bowden fishes mostly for saltwater migratory species, like sea trout, croaker and spot. For the last 15 years or more, he has steered away from the Chesapeake, preferring Chincoteague Bay and the other coastal bays along the Virginia and Maryland shore. Although the coastal bays are beginning to develop their own pollution problems, Mr. Bowden said they are still cleaner and more productive than the Chesapeake.

Mr. Bowden (“Just plain Ernie,” he said, “Mr. is for people who wear suits and ties”) knows the Chesapeake’s problems well. He is president of the Virginia-based Eastern Shore Waterman’s Association, and has served on the board of the Virginia Marine Resources Commission, which regulates the state’s fisheries, since 2003. He also acts as an advisor to the Atlantic States Marine Fisheries

Commission, which coordinates fisheries management from Maine to Florida.

“I fished over there for twenty years,” he said. “Twenty or twenty-five years ago it was nothing to catch 3,000 or 4,000 pounds of spot in a day. At 40 cents a pound, I could go over there and make \$3,000 or \$4,000 in a week. That was real good money in the ‘70s. But the number of fish just kept declining.

“I’d be up at two o’clock in the morning and get home at four o’clock in the afternoon, and I’d be up in the sea nettles the whole time. And then when the water gets hot, naturally the fish all head for the bottom, but there’s no oxygen there. I’d pull up my net and it would be full of dead fish.”

About 70 or so of his association’s members still fish the Chesapeake, he said. But “where we used to fish in the summer around the mouth of the Potomac, it’s all dead now. We (association members) don’t fish there.”

Most watermen call the oxygen-starved portions of the bay “bad water.” Mr. Bowden usually calls them “dead zones,” as marine scientists do. The low- or no-oxygen zones are caused by algae blooms, which consume the oxygen in the water. The algae blooms are caused by nutrient pollution from septic tanks and sewage treatment plants, fertilizer on fields and lawns, and urban and suburban development.

“Everybody treasures the Chesapeake,” Mr. Bowden said, but we’re all contributing to its lethal burden of pollutants.

Mr. Bowden started fishing at age 12 and became a full-time waterman in 1974. “My whole family had done it. My father and his father before him. We go way back. I can trace my English ancestors back to the 17th century here on this island.”

Back then, Chincoteague was a waterman’s haven. About 75 island men fished or worked in related businesses, Mr. Bowden said. Today, tourism dominates the economy, and Mr. Bowden is one of only four working watermen in Chincoteague.



Processing fish onboard. Credit: NOAA.



Blue crabs. Photo by Jim Brickett.

He has done well. “No need me crying poverty, ‘cause there’s no truth in it,” he said. But it’s a different way of life now that so few watermen are left.

Mr. Bowden works alone. “It’s getting hard to get crew members. It’s not steady employment for them, not like it used to be.” Catches are lower, and crew members are paid on shares, so their earnings have not kept up with inflation, he said. “\$15,000 or \$20,000 a year would be pretty good for somebody working on a boat. There’s a lot of jobs that pay better than that, with benefits.”

The family tradition is dying out. Mr. Bowden has a son, and used to take the boy out on the boat with him, teaching him to fish just as his own father taught him.

“My son loved it,” Mr. Bowden said. “But he’s way too intelligent for that, and that’s a sad statement for a waterman to make.” Instead, the young man earned a college

degree in computer engineering and now works at NASA’s Wallops Flight Center, a research facility on Virginia’s Eastern Shore not far from Chincoteague.

“My cousin and I are the only ones left” working on the water, he said. “It makes you sad to think that your family’s done it for 300 or 400 years and now you’re it.”

Up and down Virginia’s Eastern shore, watermen are leaving the commercial fishing industry to work on tugboats or get jobs on shore. That’s especially true on Tangier Island, Virginia’s counterpart to Smith Island. A few miles of Chesapeake Bay waters and an invisible state line are all that separate the two islands. For centuries the islands’ inhabitants shared a common way of life that revolved around crabbing. But Mr. Bowden said many Tangiermen are giving up that life and moving to the mainland, just like the Smith Islanders who now work in a state prison in Princess Anne, Maryland.

“I feel like I’m in prison,” Mr. Bowden said. “Not on the outside, working. I feel like I’m on the other side.”

Mr. Bowden is beginning to see algae blooms and strange diseases appear in the coastal bays, just as they did in the Chesapeake when he was a young man. He wonders if those bays’ fisheries will eventually fail. But at age 54, he says he can’t afford to try a new occupation. He’s

got too much money invested in his boats and gear.

“I used to tell everybody I was living a dream,” he said. “I still am. I’m living a nightmare now.”

Seafood-related Jobs Are Disappearing: Christine Smith

It has been a disastrous spring and summer for the Chesapeake Bay’s crab picking houses, where blue crabs are cooked, cracked open, and picked clean of their meat, which is packaged and sold as lump crabmeat.

The number of picking houses has been steadily declining along with the bay’s crab harvest. The work used to be done by watermen’s wives. Today the industry relies on immigrant workers, but a visa program for the foreign workers expired last fall. The picking houses lost the first two-thirds of the season before the visas became available in August. Most picking houses closed their doors or began supplying their customers with crabmeat packaged in the Gulf states, or in Asia.

“Smith Island is the one case where they’ve continued to operate normally,” said University of Maryland fisheries economist Douglas Lipton. “They’re the one success story.”⁴⁵

Midway through the 2009 blue crab season, the Smith Island Crabmeat Cooperative was struggling to survive. The co-op, in the village of Tylerton, was founded by a group of watermen’s wives who banded together to pick and market their husbands’ crab catches. It had fifteen members when it opened in 1996. But this year, only six women work there. And some days the crabs have been so sparse that instead of working eight hours or more, the women have run out of crabs to pick after an hour or two.

“We’re in terrible financial difficulty,” said co-op president Christine Smith, who passed away in August 2009. “We have to bring in paper towels from home. We can’t afford to buy them.”

Nonetheless, she said, “I feel like we are a success story. I mean, we’re open where other places are closed. We’re having a hard time, but we’re getting by. And we’re hoping and praying that the crabs pick up.”

Smith Island was settled by watermen more than 300 years ago, and from the beginning its economy has relied on the blue crab. The Island and its Virginia neighbor, Tangier Island, lie amid beds of sea grasses that are blue crabs’ favorite habitat. Even when the catch is bad elsewhere in the bay, it’s usually better near the two islands.

In 1980s the crabbing was good enough to support a population of about 600 people in three villages.

The island, reachable only by ferry, seemed a throwback to simpler times. Children attended a one-room schoolhouse through the primary grades. Older children went to high school on the mainland, catching a special ferry that left Tylerton at 6:20 a.m. But the education that mattered was the traditional one—how to handle a boat, how to catch crabs, how to watch through the night over a tank of “peeler crabs.” The bay provided islanders with a living, so it was common for young men to quit high school and go to work on the water.

Christine Smith grew up on the mainland. In 1982, she married Edward Smith and moved to Tylerton. “I fell in love and came over here and started picking at 31. It wasn’t that easy.”

Soon it got harder. Crab catches fell, and so did the island’s population. Today only about 250 people live on Smith Island. Tylerton has 58 full-time residents and 66 houses. About 25 of them are weekend homes for islanders who’ve moved to the mainland for work, or vacation houses for visitors.

Mrs. Smith estimated about 25 islanders, including the founder of the crabmeat co-op, have moved to the mainland to work as prison guards at Maryland’s Eastern Correctional Facility in Princess Anne. At least two men have gone to work on tugboats piloting ships up the bay’s main channel. Mrs. Smith’s

older son, 25-year-old Daniel, works on the water, but her younger son, Dustin, 23, is a truck driver for Cloverland Dairy and lives on the mainland.

Almost everyone left in Tylerton makes a living from crabbing, Mrs. Smith said. “There’s a couple that works in the store. There’s a lady that works in the post office, and there’s a lady that cleans the church, and that’s it.”

Last year, Virginia and Maryland sharply restricted the bay’s crab harvest after research showed the species is being over fished. That year, the crabs were abundant. Why is this year’s catch so much worse?

Mrs. Smith thought the problem may be related to the large clumps of seaweed that began turning up in watermen’s scrapes in July. These are not sea grasses, which provide good habitat for crabs, but slimy green strands that scientists call macroalgae and watermen call “moss.”

Macroalgae are often considered a sign of water pollution. In 2001, they began appearing in areas that were thought to be pristine, like Maryland’s coastal bays. The water quality around Smith Island is usually some of the bay’s best. But this year, rainy weather that washed large amounts of nitrogen and phosphorus into the bay, and the Maryland Department of Natural Resources reported that algae blooms were widespread in early summer.⁴⁶

“It’s such hard work pulling in them scrapes with all them mosses,” Mrs. Smith said one day in mid-July.

“My husband, he came in the other day and he said, ‘Christine, this is one of the hardest days I’ve ever had.’ I mean, they get up at 3:30, sometimes earlier than that, and he said, ‘I have scraped all day long with all those mosses and I only got one basket.’ My husband is 54 years old. He didn’t go past the ninth grade. I can’t imagine Ed living anywhere but here. He doesn’t know how to do anything else and I can see that’s worrying him.”

Mrs. Smith didn’t see any way out of the island’s predicament. “We just have to pray to the Lord to help us,” she said.

Onshore Jobs Are Changing: Cathy Davenport

When Cathy Davenport was a young girl, there were 12 houses, a handful of farms and two fish processing plants on Dymer Creek, where her family has lived for the past 100 years. Back then, in the 1950s, the water in the creek was clear enough to spot a crab on the bottom and scoop it up with a dip net, and clean enough to harvest oysters in the shallows not far from their door.

“Today we have no (fish processing) factories, and we have a thousand homes,” said Mrs. Davenport, now 63. “And we have no oysters, no crabs and no fish. Now what do you think caused that?”

“I’ll tell you. It’s development. They’ve got one, two, three, four subdivisions that run off into my creek. Everybody’s got these lush green lawns running right down to the water’s edge. I would bet you that there’s more nitrogen running off of those yards than there ever was running off of those farms.”

Mrs. Davenport has lived on the creek, just north of the mouth of the Rappahannock River near White Stone, Virginia, almost all her life. Her family’s history and livelihood are intertwined with the life of the creek and the Chesapeake Bay, just downstream.

She is a marine carpenter, one of the few who will still work on watermen’s wooden boats. She operates two marine railways, which were developed to haul boats out of the water before electric hoists replaced them in most boatyard. But Mrs. Davenport keeps hers in working order because the marine railway is gentler on an old wooden boat.

Winegar’s Marine Railway was the first of her family’s businesses, founded by her grandfather. She has some old photographs taken back then, when the boatyard was full of classic Chesapeake Bay-built wooden workboats. Mrs. Daven-

port learned marine carpentry from her father, and when he died she continued the work on her own. Today, most boats are made of vinyl and most marine carpenters don't want to mess with old wooden boats.

"They don't, but I do, and I'm not changing my ways," she said. "I guess it's kind of unusual. I do what I want to do."

These days, marine carpentry is a part-time job, but Mrs. Davenport's days are full. She is the wife of one waterman and the mother of another. And she runs the family-owned Dymer Creek Seafood Co., which packs and ships bay-caught fish to wholesale fish markets from New York to North Carolina.

"Ten or fifteen years ago we shipped a half million pounds or better every year, but it's not that now. Our business is so far down," she said. "We're just trying to hang on. That's basically what it is, just trying to hang on... In another ten years it will all be over."

Mrs. Davenport says water pollution is killing her family's way of life. "You've got a dead area in the bay that grows every year," she said. "If the men set their nets or pots or anything like that, there's nothing there when they pull them up. Either that, or the fish and crabs have all died."

Dymer Creek Seafood used to have nine fishermen working exclusively for the company. Now



A clam. Photo by patrickevanshylton.com.

there are only four boats left, two of which are run by Mrs. Davenport's husband, Ray, and her son, Bill.

"If my gill netters set their nets in one of those dead areas, the fish are white when they pull them back. The fish can't get any oxygen. They try to swim away, but the nets stop them and then they die."

The seafood company has another specialty—soft shell crabs. In April and May, local watermen go "peeler potting," seeking out crabs that are about to molt, or shed their shells. During the spring months, Mrs. Davenport may have as many as 50 peeler tanks, where the crabs are held until they're right on the verge of molting. They have to be removed from the tanks in a hurry, before their new shells can form, so it's a job that requires round the clock vigilance.

Bill Davenport started setting crab pots when he was 10 years old. He's 40 now, but he hardly crabs at all anymore.

"You put pots in the creek here and there's no crabs. There's nothing but algae," he said. "They blame it on the farmers, but you can ride up and down this whole Rappahannock River, and there's nothing but houses," he said.

This year, the fishing has been "terrible," he said. "A lot of times I've gone out there and burned up \$200 worth of fuel and come home with half a basket of fish."

Along the Rappahannock, younger watermen are leaving the

fishery, Mrs. Davenport said. "I've seen four or five of them leave and go on the tugboats recently," she said. "Sometimes I look at these young watermen like my son and I wonder, what are they going to do when it's all dried up?"

Mrs. Davenport represents Virginia on the Atlantic States Marine Fisheries Commission, which manages 23 different species of fish in 15 different states. But in spite of the commission's authority, she feels that there's not much she can do to protect her family and her community from the swift decline of the bay's commercial fisheries.

"I'm frustrated. It's major frustration," she said, "because pollution is the problem ... and the problem's not being addressed."

Bay Communities Are Failing: Frank King

When Frank King was a child growing up in Chincoteague, Virginia, in the 1970s, his family used to visit Hoopers Island, near Blackwater National Wildlife Refuge on Maryland's Eastern Shore. King remembers it as a small but bustling community, dominated by watermen and businesses that sold them supplies or bought their catch—like boatyards, seafood markets, and crab picking houses. Back then the



Crabs ready to be eaten. Credit: Chantelle Rytter

island and the communities nearby supported six grocery stores.

Today there is only one grocery store, Island Pride Market. Mr. King owns it. And in mid-July, he was steeling himself to lay off one of his five employees.

“She’s a single mom. She’s got two kids. She walks to work. She works hard,” Mr. King said. “And I’m going to have to lay her off. ... I should have done it yesterday, but I couldn’t bring myself to do it. I’m going to have to do it today.”

The market is an important community gathering place, and it directly supports 15 people in

six families, Mr. King said. But at midsummer the community it serves was in danger of economic collapse, and if more businesses fail, Island Pride Market will fail too, he said.

From May through early August, the immediate problem was a shortage of workers to staff Hoopers Island’s crab processing houses. But the underlying problem is the overall decline of fisheries once so productive that H.L. Mencken called the Chesapeake Bay “an immense protein factory.”⁴⁷

Historically, watermen harvested several kinds of seafood over the course of a year—oysters in winter, crabs in summer, rockfish, clams and other fish through most of the year. If any one species did poorly, the watermen had fallbacks. Now the blue crab fishery is the bay’s only viable commercial fishery. The area around Hoopers Island has nine crab-picking houses; it’s the main industry.

Picking crabs to extract the meat in lumps is messy, smelly, demanding work. Traditionally the wives, daughters, sisters and mothers of watermen held these jobs, which pay between \$6.71 and \$10 an hour. But local women left the industry as their families moved away from the water, or as other job opportunities opened up. Beginning in 1991 some picking houses began hiring immigrants as temporary workers. In 2006, all but a handful of Maryland’s 375 crab pickers were

immigrants, mostly from Mexico.

Each year, crab house managers get temporary visas for their workers under a special program for seasonal workers. But the nationwide supply of visas is usually exhausted by the time Maryland crab houses begin work in the summer, leaving the industry dependent on Congress for an emergency allocation of extra visas. This year, Congress had a heavy workload and by early August neither the House nor the Senate had voted to free up extra visas. About a third of the state's 22 crab picking houses were closed for lack of workers, and others were severely short-handed.⁴⁸

Combine a worker shortage with low crab harvests in the early summer, and by August the crab picking houses were in trouble. Two Hoopers Island crab processing plants had not yet opened their doors, and King was expecting more would soon close. On August 6, the Department of Homeland Security discovered that thousands of seasonal worker visas had been unclaimed and were still available. The crab house operators rushed to get their applications in, hoping to salvage the final two months of the season. Packaged crabmeat brings in an estimated \$17 million per year to the Maryland economy, and it is not yet clear how much of that income has been lost in 2009. But the cost in jobs is even higher. Douglas Lipton, the University of Maryland

economist, found that the picking houses generate 955 jobs in other businesses, like Mr. King's market—about 2.5 jobs for every crab house worker.⁴⁹

Without the income from the picking houses, the entire Hoopers Island community suffered, and sales at the grocery were way down, Mr. King said.

"We make all our money here in the summer, so come winter, we may not be here," he said, "and there's nothing we can do about it."

Mr. King is 50 years old. His wife is a school guidance counselor, and they have two school-age children. He worked on the docks at the Washington, D.C., fish market for years. "I worked for Pepsi for a while. I had a 401k and job security and I let all that go," he said. "I wanted a good way of life for my family."

He remembered Hoopers Island, and discovered the owners of the one remaining grocery wanted to retire. So eight years ago, he bought Island Pride Market. It's been a struggle. "The government's pushing on you on one side and the seafood industry's dying on the other side," he said.

Some planners tout ecotourism and "heritage tourism" as the route to prosperity for former Chesapeake Bay fishing communities. Mr. King doesn't think tourism will ever create many jobs that pay well enough to support a family, as

commercial fishing and the related businesses once did.

“I’ve tried the tourism thing. I put in a café, we sell t-shirts and that kind of thing,” he said. “But it’s not steady. You can’t count on it. When the economy’s bad on your side of the bay, they don’t come over here and spend money.”

He thinks communities like Hoopers Island are already too damaged to ride out the current hard times, in the bay fishery and in the larger economy. “It’s going to destroy a whole generation of people,” he said. “I see them moving away every week. They can’t make their mortgages.

“Unless you live here you can’t understand it. To lose a whole way of life that’s been in existence for hundreds of years, it’s kind of hard to take.”

Maryland’s Bay Culture Is in Decline: Mike Vlahovich

It was love that brought Mike Vlahovich from Puget Sound to Chesapeake Bay—love for the graceful wooden workboats that plied these waters for more than 100 years, harvesting the bay’s bounty.

Mr. Vlahovich is a descendant of Croatian fishermen who worked on the Adriatic Sea. As a young man, he was a crewman on stoutly built

fishing boats, netting salmon in the Pacific Northwest. Eventually he decided he loved fishing boats more than he loved fishing. He had a special passion for the traditional lines of wooden fishing boats.

He came to the bay region because that’s where the beautiful workboats were. Although the bay’s commercial fishing fleet was much smaller than the boom days near the turn of the 20th century, when more than 1,000 workboats dredged for Chesapeake oysters, there was still plenty of work, plenty to learn and plenty of willing teachers. In 1983, he took a job in a boatyard on Virginia’s Northern Neck, where two master carpenters, each with 30 years’ experience, taught him the trade.

In the early 1980s, Mr. Vlahovich estimates, as many as 100 local boatyards had the tools, know-how and desire to care for the bay’s commercial fishing fleet. Today, he said, there are three places where a waterman can take his old wooden boat for repairs—one boatyard on Tilghman Island, another in Dorchester County, and one on Virginia’s Northern Neck. The rest of the region’s boat yards handle cabin cruisers, sailing yachts and other pleasure boats. Most new boats have vinyl hulls that can be patched the way you’d mend a tire.

“Everyone’s going more and more to plastic these days,” he says. “They won’t touch a waterman’s boat. It’s understandable. Their

Skipjacks and Oyster Dredging

Wooden boats known as skipjacks are an integral part of Maryland's bay culture. Until recently, Maryland law permitted oyster harvesting only under sail or with hand tongs. Some areas have recently been opened to power dredging, but in other places dredging can still be done only under sail, such as in a skipjack. As they travel to and from the oyster grounds, the sailboats may get an assist from diesel-powered dinghies, called push boats. But the captains must shut down the push boats' engines before they drop their dredges overboard. The dredges, made of heavy metal mesh, are towed along the bottom. It takes great skill to dredge under sail. A steady pace, good speed and a straight course are essential; else the dredge bounces about, digs into the bottom, or wobbles and spills its trove. After a few minutes the crew hauls the dredge back on deck and sorts the catch.



The skipjack Rebecca T. Ruark approaches the harbor at Tilghman Island.
Credit: Heather Dewar

boats are messy. They have sanding duff and toxic paint and stuff. I don't blame them, I guess."

In any case, he said, most watermen are too broke to hire a ship's carpenter. "Now they can't even afford to (pay dockage fees to) tie their boat up, much less work on their boat."

Mr. Vlahovich learned the shipwright's trade here, then returned to the Pacific Northwest for 15 years. But in 2001 he came back to the bay, lured by a Maryland state program that earmarked \$150,000 over five years to restore and maintain the last remaining working skipjacks.

For Mr. Vlahovich, the most exciting part of that program was the chance to train a cadre of apprentices. "For me personally, passing on the skills and trying to teach people a passion for these boats and this way of life is what it's all about," he said.

Working out of the Chesapeake Bay Maritime Museum in St. Michaels, he took on as many as a dozen apprentices at a time. The crew worked on a half dozen skipjacks, he said, "and then September 11th happened, and we lost our funding," he said.

The program came to an end, but Mr. Vlahovich soldiers on. In 2004 he created a non-profit group, the Coastal Heritage Alliance, whose web page says it is "dedicated to preserving the vessels, skills and stories of a proud

working waterfront culture."⁵⁰ Donations to the Alliance help finance his work. He has worked on the ten working skipjacks left in Maryland. He knows them all by name, along with their owners, their homeports and their captains' current occupations.

Only four skipjacks are still fishing commercially, he said. Four more are being used in environmental education, taking passengers on the bay to learn about its ecology and history. One—Russell Dize's boat, the Kathryn—has just been sold to a man who plans to charter it, and Mr. Vlahovich is working on another one right now, also intended to carry tourists rather than crab pots.

Mr. Vlahovich travels up and down the East Coast, and as far away as Alaska, to restore old wooden workboats. Most of his work these days comes from museums and chambers of commerce in waterfront tourist towns, he said. "They want to retain a piece of their heritage. But they don't want the harvesters. So they call us in."

He wants to help watermen maintain real working boats in all their smelly, productive glory. But now, he said, he mostly helps gentrifying towns replace the real thing with a sanitized version of the waterman's way of life. "It's mission creep," he said, "and I struggle with that."

Some of his apprentices are working as master carpenters on

wooden boats today, but none of them have stayed in the Chesapeake region. They can't find work here. "They've all gravitated to museums," he said.

He worries about the loss he sees around him—and it's not just the boats that are crumbling.

"Communities are breaking up," he said. "They all become retirement communities and the bonds that held all these people together are being broken."

Watermen are hard-pressed financially and some would like to find other occupations, but they feel trapped by boat payments and other investments they've made, Mr. Vlahovich said. Some have



Capt. Wade Murphy tells passengers aboard the Rebecca T. Ruark about oysters' role in Chesapeake Bay ecology.

benefited from state programs that put them to work on various conservation projects. "But you don't see job training, you don't see anything that's giving people alternatives," he said. "They're just kind of stuck in a declining way of life."

"A whole culture is being displaced without anyone being aware of it," Mr. Vlahovich said. "It is an American culture, a unique part of our heritage, and it's being lost."

Commercial Fishing Is Fading: Wade Murphy

The Rebecca T. Ruark was the fastest boat in the Chesapeake Bay skipjack fleet. Capt. Wade H. Murphy Jr. had to have her.

Capt. Murphy, a fifth-generation Tilghman Islander and a fourth-generation waterman, began working the water in 1957 and bought his first skipjack in 1964. For the next 20 years he watched the Rebecca T. Ruark out-sail every other skipjack on the bay, including his own. Built by a skilled shipwright just a few miles down the bay in 1886, the Rebecca was fast and graceful, but she was aging badly. The wood-hulled working sailboat had been doing rough and dangerous work for years, dredging for oysters in bitter winter weather, and her deck

was rotted almost clean through.

“I knew it was rotted out,” said Capt. Murphy, who’s known as Wade. “But I knew if I could get it rebuilt I’d catch 30 percent more oysters.”

Capt. Murphy bought his dream boat and sent her to a boatyard for repairs. By the time the Rebecca T. Ruark was ready for oystering, she had cost him nearly \$100,000. It was 1984, the first year of the Chesapeake Bay Agreement.

It was also the year that deadly oyster disease moved from the bay’s southern reaches into the middle and upper bay, virtually wiping out Maryland’s oyster beds. In just two years the state’s oyster harvest was cut in half, from 2.4 million bushels in 1982 to less than 1.2 million in 1984.⁵¹

“I owed \$99,000 and all the oysters were dead,” Capt. Murphy said. “You ever been sick to your stomach?”

“It took me ten years to pay that debt off, crabbing and fishing night and day.”

By the time Capt. Murphy’s debt was paid, Maryland’s annual oyster harvest was less than one-tenth what it had been when he began oystering. The mainstay of the waterman’s livelihood was gone, maybe forever.

“I couldn’t make a living oystering,” Capt. Murphy said, “so I turned her into a charter boat. I done it to start with to keep my boat afloat. But I found I liked it. I like

teaching people about the bay.”

Seven days a week from April to November, Capt. Murphy takes paying customers out for a two-hour sail on the Choptank River aboard the Rebecca. At 123 years old, she is the oldest skipjack still under sail. A plaque near the wheel describes her as a national historic landmark.

For years he felt the pull of his old life, and took the Rebecca oystering now and then. But in November 1999 the Rebecca was on her way home to Tilghman when a freak storm sank her in 14 feet of water. Capt. Murphy and three crewmen were rescued, but their catch was lost. The Rebecca would have been lost too, if not for a \$20,000 state grant that paid to raise her from the bottom. Capt. Murphy spent more than \$10,000 on repairs, and has not gone oystering on Rebecca again.

Now he sails the skipjack for tourists only, making two trips every weekday, and three on Saturdays and Sundays.

On a hot summer afternoon, he nonchalantly steers the Rebecca away from the dock with a half-dozen passengers on board. The sleek old boat glides up the channel on a light breeze, with an assist from her push boat.

The boat motors past a pair of osprey nests, and Capt. Murphy gives his passengers a quick natural history lesson. He talks about the ospreys’ annual migration and the

dire effects of pesticides on the species, mentioning Rachel Carson, “Silent Spring” and the mid-20th century banning of DDT, then describes the young birds in these two nests and their first attempts at flight. As the skipjack enters the wide Choptank River, Capt. Murphy turns off the push boat engine, trims the Rebecca’s sails, and lets go of the wheel. Unattended, the Rebecca stays on course—something only a well-designed and well-handled sailboat can do. Capt. Murphy settles into a plastic chair, a can of orange soda in his hand and a stack of four photo albums in waterproof binders at his side.

Over the next 90 minutes or so, Capt. Murphy unwinds his skein of Chesapeake Bay stories. He talks about his boat’s namesake, the real Rebecca T. Ruark, and the early days of the Tilghman Island fishing industry. He explains the blue crab’s complex life cycle, its mating rites and its migrations in and out of the bay.

Capt. Murphy passes around his collection of historic photographs. Here’s one taken by famed bay photographer Aubrey Bodine around 1950: more than two dozen skipjacks sailing side by side along an oyster bar, their dredges trailing behind them.

“You’re never going to see this again,” he said sadly. “Never! It’s over! Done!

“I seen it,” he said sadly, “but

you won’t.”

And neither will Capt. Murphy’s two sons.

“My great-grandfather, my grandfather, my father and myself, we all could make a living. My boys can’t make a living. They’ve gone to carpenters. It’s a damn shame.”

A hundred years ago, the bay’s commercial fishing fleet numbered more than 1,000 boats. In 1957, when Capt. Murphy first went on the water, about eighty were left.⁵²

Today, just four skipjacks still harvest oysters under sail. At least six others are teaching boats, operated by foundations or entrepreneurs like Capt. Murphy.⁵³ A few are in museums. The rest are gone.

Most watermen say government regulations are killing their livelihood. But Capt. Murphy knows his heritage is dying from multiple causes. When a passenger asks him what happened to the oysters, he ticks off a half dozen forms of human error:

Maryland and Virginia officials mismanaged the bay for more than 100 years, he said, lacking the political will to stop a seafood free-for-all. Watermen over-fished the resources. Development and dams changed the bay’s natural cycle of rising and falling salinities. Cargo ships introduced lethal diseases. And pollution weakened the oysters. He also suspects global warming is a factor.

Policy Recommendations

A clean, healthy Chesapeake Bay is a prerequisite for any sustainable fishery. In order to restore both the fisheries and the livelihoods of the watermen that rely on them, we need to make full use of existing laws designed to restore and maintain a healthy bay, and plug the gaps where those laws are deficient.

Agriculture, urban runoff and sewage treatment plants put too much nitrogen and phosphorus into the bay, creating a dead zone each summer in which almost no organisms can survive. The solutions to cleaning up the Chesapeake Bay are well known. We need the political will to fully implement those solutions.

The Environmental Protection Agency, other federal agencies, Maryland, Virginia, Pennsylvania and the District of Columbia have a golden opportunity right now to put bay restoration efforts on the right track. In May 2009 President Obama issued an Executive Order requiring the EPA to craft a new

plan for restoring the bay. The EPA and the bay partners should work together to take full advantage of these opportunities for reform.

The new plan should address all sources of pollution and enable regulators to do their job. The relevant agencies should:

- Strengthen state and federal limits on agricultural pollution.
 - Fully implement the federal Concentrated Animal Feeding Operations (CAFO) and state Animal Feeding Operations (AFO) permitting programs to ensure they deliver real water quality benefits, cover all eligible operations, impose penalties that deter non-compliance, and conduct annual inspections of operations.
 - Modify existing state nutrient management plan regulations so plans achieve

optimal nutrient application rates and include best practices called for in the Tributary Strategy plans.

- Cut pollution from development by setting clear, enforceable stormwater standards for new development, redevelopment and municipalities. Standards should also apply to federal and state facilities and roads. New stormwater management approaches should include:
 - The use of environmental site design approaches that have been shown to be practicable in cities such as Philadelphia, Seattle and Portland.
 - Protection of high quality waters and the forests, open space and working lands that protect the bay. Integral to that protection is the implementation of compact, mixed-use transit-oriented development and re-development that reduces stormwater pollution on a watershed scale by reducing overall land consumption and imperviousness.
- Provide adequate funding to enable wastewater treatment plants to meet a best available control technology standard,

especially as individual permits come up for renewal. Increased federal, state, and local funding will be necessary.

- Fully enforce pollution limits.
 - Enforcement of permit limits for municipal and industrial sources must be improved, with the commitment of resources necessary for adequate review and action on proposed permits, monitoring reports, site inspections and reported violations.
 - Regulators should create an independent evaluator who reports directly to the Chesapeake Bay Program's Executive Council, and who has the authority and resources to spotlight problems with an individual partner's performance.
 - Polluters and bay jurisdictions should experience clear consequences for failing to meet commitments and make sufficient progress in achieving pollution reduction goals.
- Provide "reasonable assurances" that nonpoint source reductions will be accomplished within a reasonable time frame.

- States must offer robust “reasonable assurances” that the nonpoint source reductions will be achieved on a timely basis. Otherwise, EPA may require significantly greater restrictions on point source discharges.
- States must ensure pollution reduction plans contain compliance schedules, measurable milestones and sufficient monitoring. If states fail to make progress toward compliance with water quality standards, EPA must prohibit the issuance

of new or expanded permits for nutrients or sediment until such progress is demonstrated.

We are optimistic that full enforcement, and strengthening as needed, of the Clean Water Act will produce genuine restoration. We believe true restoration can sustain all of the Chesapeake Bay’s living resources, including the small number of men and women who carry on a 300-year-old tradition, keeping its heritage alive for the benefit of all 16 million residents of the watershed.

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