

CHESAPEAKE

BAY JOURNAL

June 2022

Volume 32 Number 4

Independent environmental news for the Chesapeake region



50 years later: Killer storm Agnes haunts Bay watershed

PAGE 18

CRAB POPULATION REPORT



Annual survey finds blue crabs at 30-year low [PAGE 11](#)

GROWTH & FOREST LOSS



Hi-res images reveal more development [PAGE 10](#)

ABANDONED BOATS



Derelict boats pose expensive, complicated problems [PAGE 14](#)

NONPROFIT ORG
U.S. POSTAGE
PAID
PERMIT 280
LANG, PA 17604

Bay Journal | P.O. Box 300 | Mayo, MD 21106

Killer storm Agnes continues to haunt Bay watershed

June marks 50-year anniversary of disastrous deluge

By Jeremy Cox

Fifty years ago, Tropical Storm Agnes detonated a water bomb over the Mid-Atlantic. Over a handful of days in June 1972, relentless rain triggered record-breaking floods.

The storm's human toll was monumental: a path of destruction through a dozen East Coast states; 122 people dead, 48 in Pennsylvania alone; and \$3.1 billion in damage. It was the nation's costliest natural disaster at the time.

And the environmental consequences, in the eyes of contemporary observers, were simply unimaginable: a shock wave of filthy water pummeling the Chesapeake Bay from nearly every direction, replacing its fragile balance with chaos.

In some ways, North America's largest estuary, experts say, has never been the same.

"What's interesting, given that it's 50 years later, is we still see some of these alterations that have persisted," said Rom Lipcius, a longtime scientist with the Virginia Institute of Marine Science. "A lot of [the memories] have faded. The historical baseline shifts, and we think this is the way it's always been. And that's just not the case."

With half of a century's worth of perspective, let's look back at how the ecological blow from a devastatingly wet week continues to echo across the Chesapeake and its watershed.

Bay's problems become 'real'

Agnes forever altered the way the public regarded the Chesapeake Bay. And as the fourth employee at the Chesapeake Bay Foundation, Mary Tod Winchester had a front-row seat for the shift.

She grew up on the West River in Galesville, MD, a member of a family that has owned and operated a boatyard on the waterway for eight generations.

"When I was growing up, obviously, [the Bay] was really pretty healthy," Winchester recalled. "And then in the '60s is when we really noticed a change."

Underwater grasses, the centerpiece of the Bay's food web, were dying off. Problems such as diseases and overharvesting had ravaged oysters, crabs, clams and other important fisheries. But beyond a relatively



Tropical storm Agnes devastated communities along the Susquehanna River in late June 1972, including the town of Wilkes Barre, PA, shown here. (Courtesy of the National Weather Service)



Mary Tod Winchester was working for the Chesapeake Bay Foundation when Tropical Storm Agnes hit in 1972. She said the storm drew attention to the ecological woes of the Bay. (Dave Harp)

small group of scientists and activists, few people paid much heed to the estuary's growing ecological woes, Winchester said.

"And that was one of the things about Agnes," she said. "It was a wake-up call, and it really helped to ring the bells that there was a problem here."

Swirling and twisting its way northward from the Gulf of Mexico, Agnes could only muster sustained winds of 45 mph by the time it reached the Chesapeake region. But

it literally rewrote the books on rainfall. The system stalled over the Susquehanna River basin June 21–24, dropping, dropping as much as 18 inches of rain.

Agnes heralded a decade of soggy weather and unusually high river flows, which unleashed tons of nutrients and sediment into the beleaguered Bay. As a result, Winchester said, the public and their elected representatives could no longer ignore the environmental disaster unfolding before their eyes.

"Everyone began to realize how important it was for Pennsylvania, Maryland and Virginia to be working together on Bay issues," she said.

The Chesapeake Research Consortium, a hub for Bay-related research, was born in the immediate aftermath of Agnes as scientists scrambled to understand the full breadth of its impact. By the end of the decade, Congress acted, funding a five-year, \$27 million study to examine the Bay's rapid deterioration.

Winchester stayed with the Bay Foundation for more than 40 years, rising from the executive director's secretary in 1971

to vice president of administration. There were several important milestones as the advocacy group flowered into a powerful regional political force with nearly \$30 million in annual revenue. But Agnes was certainly one of them, she said.

"It helped to energize CBF," she said of the organization, which formed in 1966. "It helped us show the public we're not just a bunch of hippies trying to say the Bay is dying and raising money so that we can, you know, pay people to have jobs. Agnes made it real."

Clamming up

Rarely is a single event to blame for the decline of a species. One exception may be the soft shell clam population of the Chesapeake Bay.

Soft shells (*Mya arenaria*), named for their brittle, oval shells, were so abundant in the Bay region during the 1950s and '60s that Maryland crowned an annual "clam queen" to promote the vibrant fishery. Their meat has been sought over the years as a staple in New England-style stews and for baiting blue crab pots.

Annual clam landings peaked in the state at 680,000 bushels in 1964 but remained higher than 500,000 through 1971.

Agnes' consequences were immediate and devastating. The storm delivered an onslaught of sediment to the Bay, slathering most of the clam's bottom habitat with a layer of thick mud.

About nine out of 10 soft clams died from the suspected combined stress of low salinity and abnormally high water temperatures, according to the Chesapeake Research Consortium. Scientists conducting painstaking surveys failed to locate a single living soft clam in the Rhode and South rivers near Annapolis in the months after the storm.

Maryland authorities temporarily banned clamming three months after the storm to promote its recovery. Over the next two decades, the population perked up somewhat but nowhere near its pre-Agnes levels. Today, the fishery is classified as a remnant of its former self.

Diseases and worsening water quality certainly played roles in suppressing the clam's numbers, experts say. But computer modeling by Lipcius and some of his colleagues suggests that Agnes was the tipping point for clams.

Blue crabs had always been one of their major predators. But with clam numbers significantly thinned after the storm, they couldn't reproduce enough to outpace the crabs' appetite.

"So, those are two species that got hit — one that has never recovered and one that did recover," Lipcius said.

The downfall of underwater grass

Beneath its surface, the Chesapeake Bay once abounded with a rich panoply of plants that thrive underwater. So, could a burst of additional water be a bad thing?

Agnes underscored that it can be.

The Bay's grass acreage had begun to backslide in the 1960s. Then Agnes wiped out about half of what was left, accelerating that downward trajectory in a phenomenon "unprecedented in the Bay's recorded history," wrote VIMS researchers Bob Orth and Kenneth Moore in an influential 1983 study. Unlike previous downturns, the 1970s die-off appeared to strike not just one plant species or one localized area but all species across the Bay, they said.

The submerged meadows are among the most crucial indicators of Bay health because they require clear water to survive. Under the Bay's multistate and federal restoration effort, nutrient-reduction goals are aimed at improving water clarity enough to reach a goal of 185,000 acres of grasses



The Bay's underwater grasses had begun to backslide in the 1960s, and Agnes wiped out about half of what was left. (Will Parson/Chesapeake Bay Program)

covering its bottom.

In 2020, VIMS mapped a total of just 62,000 acres, barely one-third of the targeted amount. In the nearly 40 years since the Bay cleanup formally launched, the underwater plant coverage has had its ups and downs but has never surpassed 110,000 acres.

The persistently disappointing vegetation data likely contain a faint echo from Agnes, said Andrew Dehoff, executive director of the Susquehanna River Basin Commission, a state-federal compact with the authority to regulate water use within the river's 27,510-square-mile watershed. Had Agnes arrived at another time of year, the grasses, he said, might not have fared so poorly.

"The impact to the Bay was quite significant because the delivery of sediments and nutrient loads occurred in June, the critical part of the growing season for submerged grasses," Dehoff said. "Vegetation was inundated. And that's very difficult to recover from."

'Last nail' for shad

Inside a musty-smelling cannery that has been transformed into a museum for antique Chesapeake Bay workboats, Pete Leshner fixed his attention on one of the smallest vessels in the collection.

If paint had ever clung to its wooden surface, it has long since rubbed off. A sign gives its dimensions as 18 feet, 9 inches in length and 5 feet at its widest. But the most important feature, in Leshner's eyes, is its completely flat bottom, which ensured maximum stability and allowed it to be hauled directly onto the shore, if necessary.

Leshner, the chief curator for the

Chesapeake Bay Maritime Museum in St. Michaels, MD, explained that this rustic-looking skiff was designed and built with a singular purpose: netting American shad from the Eastern Shore's Choptank River.

"Little local variations are these expressions of local culture," he said. "Note," he went on, "the way they specifically shaped this boat for this fishery in this place, the length of boat determined by the length of net that they're going to use, the depth of net determined by the depth of water."

After Agnes, Leshner added, this boat was pretty much obsolete.

Shad once numbered in the tens of millions during their spring spawning runs up the Chesapeake's rivers. But overfishing, increasing water pollution and dam construction sent their population into a downward spiral during the middle of the last century. Agnes all but finished it off, experts say.

"Agnes was the last nail in the coffin" for shad, Lipcius said. "The reason that they got hit hard is because that's when they are spawning. They've migrated upriver to the tributaries, and that's where the sediment and river flow hit the hardest. And so, boom, it just washed out the larvae."

Maryland banned Bay shad fishing in 1980, the Potomac River was closed in 1982 and Virginia shuttered its portion of the Bay in 1994. Today, the shad population remains at historic lows in the Bay region and throughout its East Coast range, hovering around 1% of its late-1800s abundance, scientists say.

The drastic reduction in shad was also a sharp blow to the Bay's aquatic life. The fish had served as a vital link in its food chain.

Small and unseen losses

In the wake of Tropical Storm Agnes, scientists who often didn't know how they were going to finance their work were nonetheless quick on the scene, trying to quantify and explain the environmental damage. That search continued for decades, yielding thousands of pages of research.

But some of the storm's consequences couldn't be measured with the tools available then or now. Like the loss of a girl's verdant playground.

Elizabeth Andrews still remembers the crayfish.

A winding path of yellow pavers, which the 10-year-old version of herself called the Yellow Brick Road, led down a hill from her family's house in Fairfax County, VA. At the bottom flowed a little stream, a tributary of Accotink Creek, that hummed with enough life to sustain a young girl's imagination.

"It was a beautiful natural setting to grow up in," Andrews recalled. "We played down in the lower part of the yard, which was all woods all the time. And there were crayfish, and there were ducks that came all the time to eat the crayfish."

During Agnes, the trickle behind her house morphed into a roar, carrying away anything unlucky enough to get in its way. When the flood finally receded, the fence along the the yard was strewn with trash.

"That was remarkable to me because I didn't think there was much trash in the area," Andrews recalled. "And the whole lower yard, of course, was covered with sediment. It was a mess and drowned out plants."

Andrews' love of nature spilled over into her professional life. She worked for a time as head of the environmental section of the Virginia Office of the Attorney General and currently oversees the Virginia Coastal Policy Center at the William & Mary Law School.

Agnes shook her 10-year-old world. But the real disaster came afterward, she said.

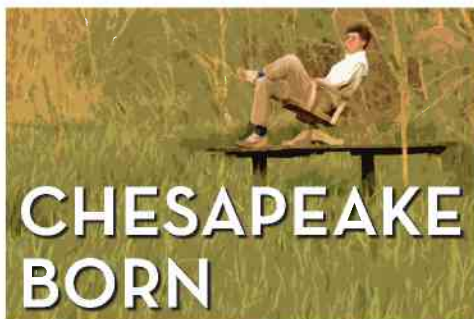
The county brought in a bulldozer to straighten the stream and festooned its formerly green banks with ugly chunks of concrete, ostensibly to ward off erosion during future storms, she said.

The ducks and crayfish never returned. The magic was gone. ■

Bay Journal podcast

Work is underway for a new series of Bay Journal podcasts to detail the impacts of Agnes and explore how the region may or may not be prepared for a similar storm in the future. If you have stories or photos to share, send us an email at Agnes@bayjournal.com.

Agnes: 50 years later, still the biggest story I ever covered



By Tom Horton

I learned a lot from Tropical Storm Agnes, arguably the most impactful storm to hit the Chesapeake Bay in the several thousand years the current estuary has existed.

Not least among those lessons was the importance of timing. Agnes struck 50 years ago this June, before I had worked on the *Baltimore Sun* long enough to even get my name on the front page stories I wrote about the storm. I wasn't assigned them because of my reportorial skills; I had a big GMC pickup with enough clearance to traverse flooded roads.

Half a century later, of the thousands of articles and several books I've written about the Bay, the biggest story I ever handled is still the one that came just a couple of months into my career.

For the Bay, it was exquisitely bad timing, seasonally speaking. Agnes came when oysters were spawning, seagrasses were flowering, fish were hatching. Massive influxes of freshwater, extending for weeks well south of the Potomac River, were deadly to shellfish. Unprecedented volumes of sediment smothered great swaths of Bay bottom, wiping out thousands upon thousands of acres of underwater grasses.

"The storm broke all existing records, not by trivial percentages but by huge multipliers ... all living things in the Bay were imperiled," wrote author James Michener in his 1978 bestselling novel, *Chesapeake*.

Chesapeake was, of course, fiction, and in the novel's timeline "the storm" was the Great Chesapeake Hurricane of 1886 — but as someone who reported on Agnes, it was clear to me where Michener got the basis for that chapter (*Voyage Eleven: 1886*).

Agnes on its way to the Bay seemed

innocuous enough. Indeed, newspaper readers that fateful week may have been more intrigued by short stories about a burglary of Democratic campaign headquarters at the Watergate apartments.

Moving north from Yucatan, Agnes had been downgraded to a tropical storm by the time it hit Florida's panhandle June 19. Its winds would never top 45 mph.

But the rain, oh my. Beginning on the afternoon of Wednesday, June 21, Agnes would thoroughly soak Maryland and Virginia, move through Pennsylvania and then double back and stall, dropping enough water across most of the Bay's six-state watershed to raise the water level in the whole estuary by about 2 feet, had there been a dam at its mouth.

Agnes drowned more than a dozen motorists in Washington's Rock Creek Park and flooded 200 blocks of downtown Richmond. It blasted down Baltimore's Jones Falls with such sudden fury that it drowned three children as their mother was strapping them into car seats for an escape.

Hardest hit was Pennsylvania, where for a time, water roiling down the Susquehanna threatened to break through the Conowingo Dam, imperiling Port Deposit just downriver. The deluge did fracture one end of the mighty dam, which is anchored in bedrock and thick enough to carry U.S. Route 1 across the river. The road was closed for months while a quarter-inch gap was repaired.

My notes on the water gushing through Conowingo's floodgates describe it as "projectile vomiting," spewing virtually horizontally for many yards.

At Harpers Ferry, WV, where the Shenandoah River meets the Potomac, I ventured out over a railroad trestle where a loaded coal train had been parked to stabilize the crossing. I had to crawl, the whole affair was shaking so badly in standing waves where the two rivers collided. I estimated their height at 10 feet.

Another lesson was the power of "episodic" events. In a few days in June 1972, more polluting sediment washed into the Bay than it would normally receive in several decades. That included an estimated 20 million tons scoured from behind



A post-Agnes view of Cartersville, VA, on the James River about 25 miles west of Richmond. The flood destroyed the Route 45 Cartersville Bridge, built in 1884, carrying away its four center spans. The two shoreside spans of the bridge still stand beside a new bridge and are preserved as historical sites. (Library of Virginia via Flickr Commons)

Conowingo Dam, where it had been collecting since the dam was built in 1928.

Just think. If you were a scientist studying how sediment entered the Bay for a whole, long career, everything you thought you knew would have been changed in the space of a weekend.

There is another lesson we should have learned but did not. Agnes' fury exquisitely exposed how much we had altered the watershed that it fell on: paving, developing, ditching, draining wetlands, doubling and tripling uses of fertilizers.

There is little doubt that the prehistoric Chesapeake saw storms the equal of Agnes or bigger. But that watershed had far more resilience. Its forests and wetlands and millions of beaver dams and ponds were able to retain and restrain the runoff, to let it soak in and filter through the groundwater. Also, oysters grew on massive reefs, closer to the surface, and were therefore less susceptible to smothering than today's flattened, dredged oyster beds.

Since Agnes, we have made a nod toward outfitting development with stormwater controls. But in the last decade, some 40 years after Agnes ran 12 feet deep down Main Street in Ellicott City, MD, two big rainfalls in the space of a few years inundated the town again.

Some scientists have noted that the Chesapeake ecosystem was never quite the same after Agnes. I think it was not Agnes so much as Agnes pulling the trigger.

After World War II, we had begun to seriously chip away at the Bay watershed's natural resilience. We added more and more potential pollutants to farmland, more and more septic tanks and sewage lagoons to suburban and urban lands.

But from the mid-1950s until Agnes, the Bay region was dry, with river inflows ranging from below normal to historic droughts. Agnes ushered in a decade that was wet, with rivers running high throughout the 1970s, even if you took Agnes out of the equation. Nature had covered our sins — until it didn't.

We will literally never see another Agnes. The National Weather Service has retired the name, along with the names of several dozen of our deadliest and costliest storms.

And on the bright side, all of that freshwater in 1972 depressed stinging sea nettle populations Baywide for years. ■

Tom Horton has written about the Chesapeake Bay for more than 40 years, including eight books. He lives in Salisbury, where he is also a professor of environmental studies at Salisbury University.