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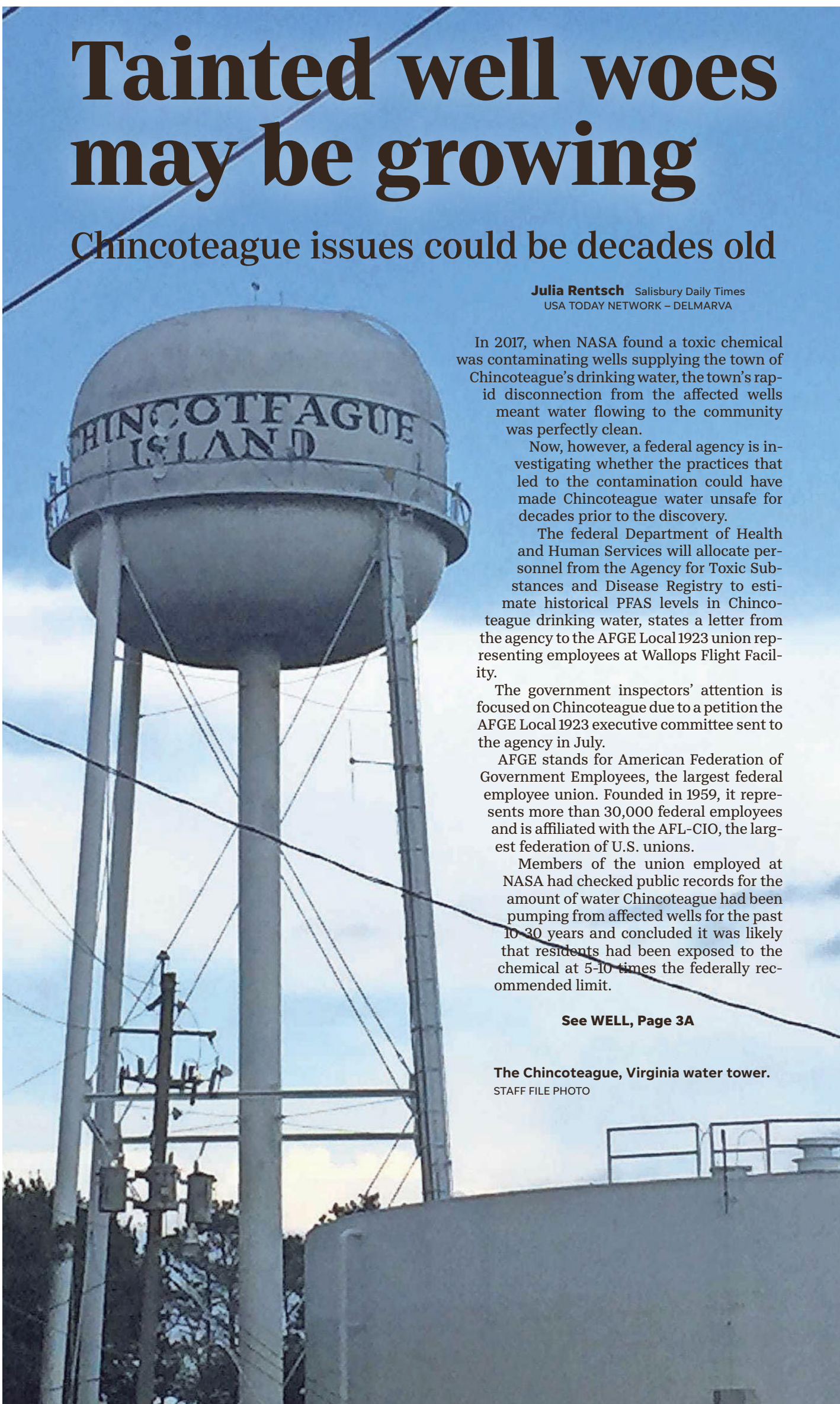


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WEDNESDAY, DECEMBER 18, 2019 ■ TASLEY, VA

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Tainted well woes may be growing

Chincoteague issues could be decades old

Julia Rentsch Salisbury Daily Times
 USA TODAY NETWORK - DELMARVA

In 2017, when NASA found a toxic chemical was contaminating wells supplying the town of Chincoteague's drinking water, the town's rapid disconnection from the affected wells meant water flowing to the community was perfectly clean.

Now, however, a federal agency is investigating whether the practices that led to the contamination could have made Chincoteague water unsafe for decades prior to the discovery.

The federal Department of Health and Human Services will allocate personnel from the Agency for Toxic Substances and Disease Registry to estimate historical PFAS levels in Chincoteague drinking water, states a letter from the agency to the AFGE Local 1923 union representing employees at Wallops Flight Facility.

The government inspectors' attention is focused on Chincoteague due to a petition the AFGE Local 1923 executive committee sent to the agency in July.

AFGE stands for American Federation of Government Employees, the largest federal employee union. Founded in 1959, it represents more than 30,000 federal employees and is affiliated with the AFL-CIO, the largest federation of U.S. unions.

Members of the union employed at NASA had checked public records for the amount of water Chincoteague had been pumping from affected wells for the past 10-30 years and concluded it was likely that residents had been exposed to the chemical at 5-10 times the federally recommended limit.

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The Chincoteague, Virginia water tower.
 STAFF FILE PHOTO

How will 'sanctuary' impact Va. gun laws?

Resolutions come before Democrats take control

Ryan W. Miller
 USA TODAY

A wave of counties and towns in Virginia are declaring themselves "sanctuaries" for the Second Amendment, but the resolutions are largely symbolic, legal experts said.

The push comes in anticipation of a Democrat-controlled General Assembly that will take office in January. State lawmakers, along with Gov. Ralph Northam, have promised Virginians a host of stricter gun laws as Democrats take full power in the state for the first time in decades.

More than 40 local governments have passed resolutions to protect citizens' Second Amendment rights against the potential laws they said are unconstitutional.

Gun safety advocates and some legal experts, however, call the resolutions "publicity stunts" that lack the force of law.

Here's what to know about Second Amendment sanctuaries:

Do Second Amendment sanctuary resolutions change the law?

"It's mostly a political statement," said Richard Schragger, a professor at the University of Virginia School of Law, who focuses on the intersection of the Constitution and local law.

Rather than challenging an existing statute, the resolutions are "mostly expressive and symbolic" declarations, he said.

"In Virginia, state law supersedes local law. Citizens and local officials have to comply with state law even if a county declares itself to be a Second Amendment sanctuary," Schragger added.

Dana Schrad, executive director of the Virginia Association of Chiefs of Police, said the resolutions are "meant to put political pressure on elected officials."

Before the election in Virginia, gun policy was the most important voting issue among Democrats and Republicans, according to a Washington Post-George Mason University poll.

Democrats campaigned on a slew of possible new restrictions, including universal background checks for gun buyers, limits on the sale of certain types of firearms and a "red flag" law that would allow guns to be taken from a person deemed by a court to pose a dan-

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Well

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Union members have been “frustrated in (their) attempts to get NASA management to release more information to employees and local residents” about the possible contamination, states a note from AFGE Local 1923 chief safety officer Richard O. Hooks to The Daily Times.

Therefore, they took it upon themselves to get the word out.

Hooks, who is employed at the Wallops facility, said he and his colleagues could not stand by while they felt the issue was being covered up.

“The town and NASA have not really been honest with people that there’s a possibility they’ve been exposed to these chemicals over the last 10 to 30 years,” Hooks said.

In a statement, NASA Wallops’ associate chief spokesman emphasized NASA’s “proactive” responses to the PFAS contamination.

“NASA recognizes that several employees have raised questions about possible historic exposures,” NASA Wallops spokesman Jeremy L. Eggers wrote in an email. “NASA has met with AFGE representatives several times to discuss these concerns. NASA has also continued to provide public updates including Public Information Sessions to employees and the public.”

The town of Chincoteague did not respond to a message left with town manager Jim West.

Working with the Virginia Department of Health, DHHS will produce a report of its findings that will be made public in late 2020 or early 2021.

What’s a PFAS?

The crux of the contamination concern involves the close proximity of the town of Chincoteague’s wells to the NASA Wallops Flight Facility Main Base, where firefighters have trained and performed at real scenes on the airfield for decades. The aqueous film-forming foam used to smother fires for years contained PFAS.

PFAS are man-made compounds that formerly were used in a variety of consumer products in need of a slick surface. The two main kinds of PFAS are PFOA and PFOS, which have each been studied more than the other kinds, according to the federal Environmental Protection Agency.

Both PFOA and PFOS do not break down easily in the environment or in the human body, which means they can build up over time. Although PFOA and PFOS are no longer manufactured in the United States, they are still produced internationally and can be imported into the United States in goods such as carpet, leather, textiles, paper and packaging, coatings, rubber and plastics.

Studies indicate that PFOA and PFOS can cause reproductive and developmental issues, liver and kidney problems, and negative effects on the immune system, according to the EPA. Cancer can be an effect of exposure to PFOA and thyroid hormone disruption can be a result of PFOS.

How PFAS is measured (parts per trillion) hints at just how toxic it is, Hooks said.

The EPA’s health advisory on PFOA/PFOS is 70 nanograms per liter, or parts per trillion (there’s not yet an advisory on other kinds of PFAS). Most common water-borne toxins, like lead or copper, are measured in parts per million.

As an example of the difference between million and trillion, a million seconds is about 12 days; a trillion seconds is about 31,710 years. It would take much less PFAS than lead to affect someone consuming it through their drinking wa-



The SubTec-8 sounding rocket is launched from the NASA Wallops Flight Facility on Oct. 23.

IMAGE COURTESY OF NASA

ter.

The EPA’s limit on PFOA/PFOS in drinking water, developed in 2016, could go down as the substances are subjected to more study, Hooks said.

In 2016, NASA found both PFOA and PFOS in the groundwater under a former firefighting training site at Wallops at concentrations 50 times higher (PFOA) and 342 times higher (PFOS) than the limit articulated in an EPA drinking water health advisory, according to DHHS’s letter to Hooks.

At that time, NASA found no PFAS in a sample of finished drinking water at the main base, but drinking water from the town of Chincoteague was found to be contaminated with PFOA, PFOS and other less-studied kinds of PFAS at levels below the EPA’s health advisory. According to public records of the town’s pumping, it is likely that about half the water Chincoteague has used over the last 30 years came from contaminated wells, Hooks said.

The toxin is primarily an issue in the summer, as Chincoteague predominantly obtains drinking water from four deep wells located on the east boundary of the Wallops main base for most of the year. But when the town’s population spikes with summertime tourism, the town supplements its water supply with three shallower wells in the same area.

Water samples from three Chincoteague wells — two shallow and one deep — were found to be above EPA’s limit for PFOA and PFOS, while a fourth contained elevated levels of other kinds of PFAS, the letter states.

NASA and the town acted quickly to disconnect the Chincoteague water supply from the affected wells, and as a result PFAS concentrations have been undetectable or nearly undetectable in both Chincoteague and Wallops drinking water since April 2017. The finished water is tested monthly, the letter states.

To meet water demand, the town has instead been obtaining water from the main base’s wells.

NASA is constructing a groundwater treatment plant that will allow the town to use the four PFAS-contaminated wells again, scheduled to begin operation in spring 2020. However, it is possible that the amount of contamination in the wells will be too much for the plant to handle, once it eventually comes online, Hooks said.

While he credits NASA in acting quickly to switch Chincoteague off the contaminated wells, Hooks said the union is acting to spread this information to the public out of concern for its members and their families who live in town.

“When it deals with human health and well-being, I’m going to stand up and say, ‘You can’t really do that, you have to clean up your messes like any other business,’” he said.

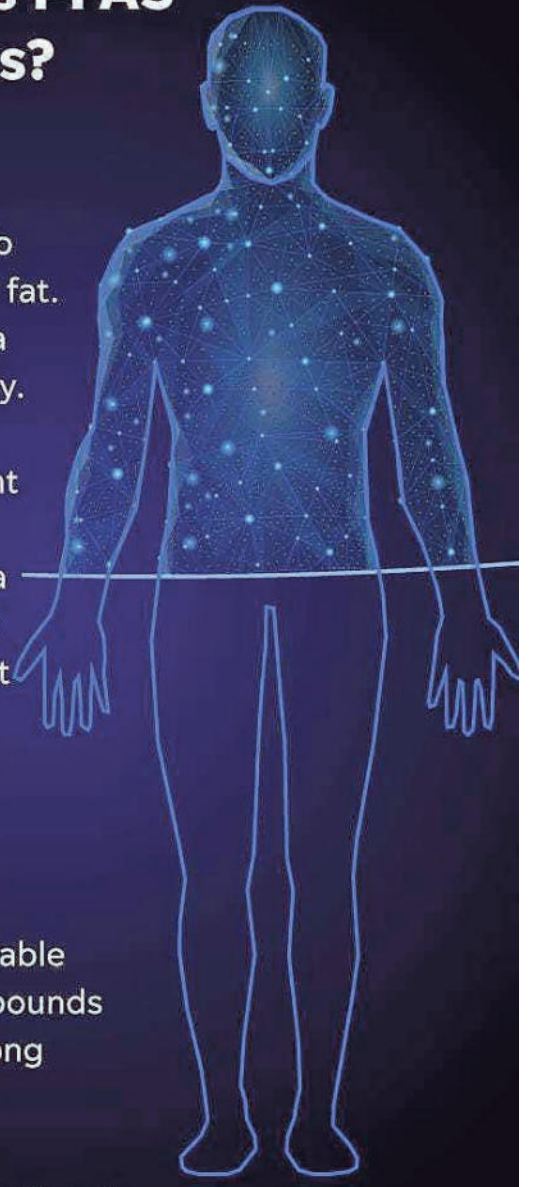
How long does PFAS stay in humans?

Unlike many chemical contaminants, PFAS compounds don’t tend to accumulate in a person’s fat. But they still persist for a long time within the body.

The half-life – the amount of time it takes for the body to remove 50% of a chemical – is roughly 4.8 years for PFOS and about 3.5 years for PFOA, two common forms of PFAS used in many consumer products.

Little information is available on how other PFAS compounds affect a person or how long they stay in the body.

SOURCE Centers for Disease Control and Prevention



“The town and NASA have not really been honest with people that there’s a possibility they’ve been exposed to these chemicals over the last 10 to 30 years.”

Richard O. Hooks
AFGE Local 1923 chief safety officer

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GOP pushing Shore as 2nd Amendment sanctuary

Kamleshkumar Desai
Salisbury Daily Times
USA TODAY NETWORK - DELMARVA

Republican Party units on the Eastern Shore of Virginia are pushing for declaring both local counties as Second Amendment sanctuaries.

A press release on behalf of the chairmen of Northampton and Accomack counties' Republican units, Rob Stubbs and Wesley Edwards respectively, says they are in full support of declaring both counties as sanctuaries.

They are asking residents of both counties to attend meetings of their respective Boards of Supervisors to request county officials to adopt such a declaration.

"To accomplish this task we urge residents to attend their respective Board of Supervisor's meeting and request it be adopted by the Board," said Edwards, the Accomack GOP unit chairman.

Local officials in several Virginia counties have voted to declare their counties to be Second Amendment sanctuaries, according to reporting by the Associated Press.

The movement has spread in Virginia since the Nov. 5 election, when Democrats gained majority control of both the state Senate and House of Delegates.

"There is great concern that with the new session there will be many changes made to our gun rights, including red flag laws. We see this as a bipartisan issue that affects us all," Stubbs said.

The next meeting of Northampton County Board of Supervisors is scheduled for Tuesday, Dec. 10, from 5-9 p.m. while Accomack County supervisors' are scheduled to hold their meeting on Dec. 18 from 5-7 p.m.

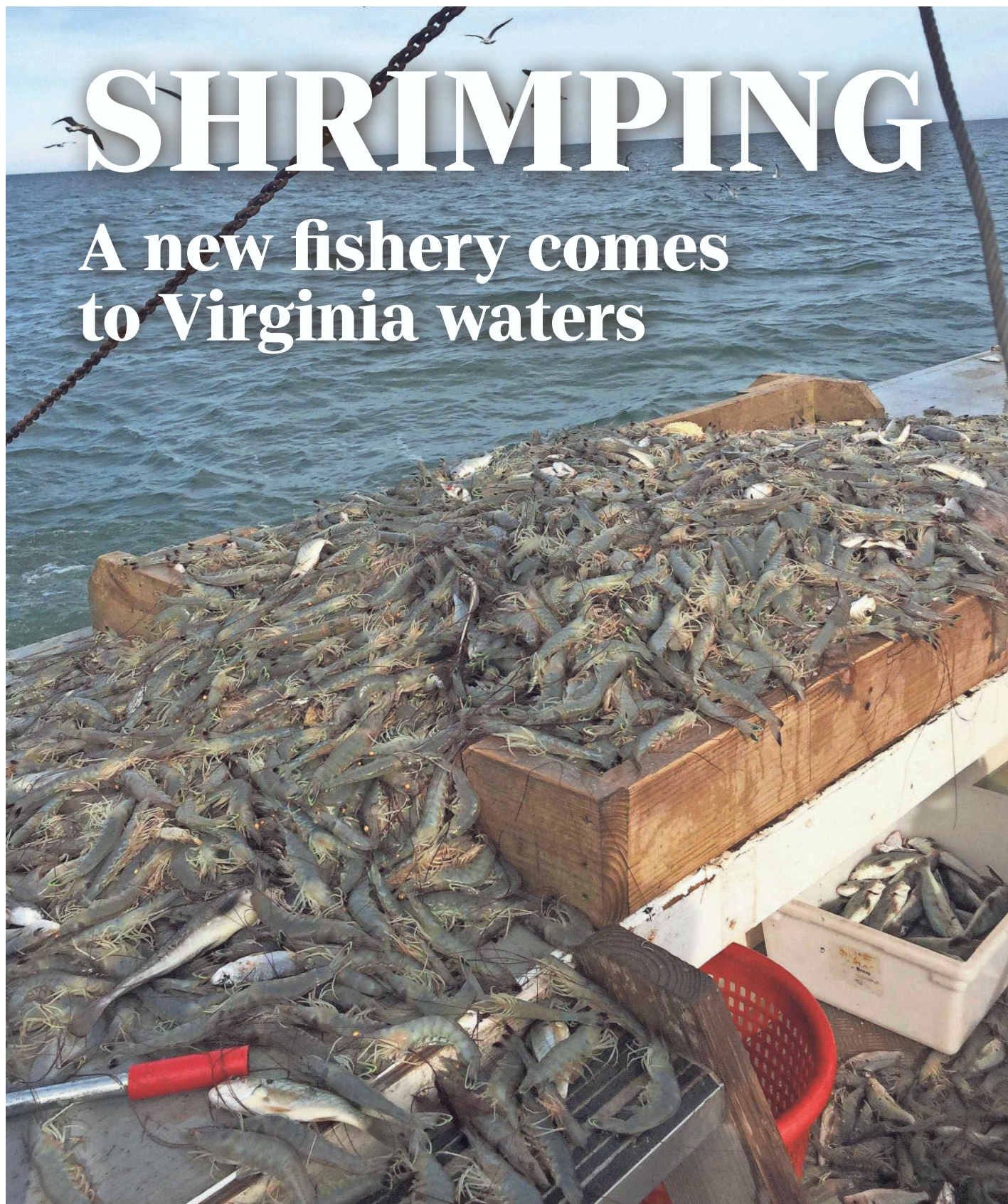
"We need folks to attend, call or write their supervisors," said Edwards.

To date 15 out of the 95 counties in Virginia have adopted Second Amendment sanctuary resolutions with many more counties in various stages of adopting the resolution, according to the release.

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Gun rights supporters attend a Virginia Citizens Defense League rally in Richmond. VCU-CNS PHOTO BY MECHELLE HANKERSON



SHRIMPING

A new fishery comes to Virginia waters

Shrimp are harvested from a new commercial fishery off the coast of Virginia. COURTESY OF THE VIRGINIA MARINE RESOURCES COMMISSION

Six watermen granted licenses to trawl off Shore

Julia Rentsch Salisbury Daily Times | USA TODAY NETWORK - DELMARVA

White shrimp are being pulled by the thousands from the water off the Eastern Shore of Virginia.

The water is not usually warm enough for them, but from this year forward, the shrimp are likely here to stay.

White shrimp, which thrive in the Gulf of Mexico and south Atlantic Ocean, typically only venture as far north as North Carolina in any significant numbers. A ghost of a shrimp market has existed off Virginia for only one or two weeks out of the year, but this year, it's something different.

This fall, six watermen have been granted licenses to trawl for much larger quantities of the succulent 4-8 inch shrimp in an experimental fishery, which stretches three miles off the ocean side of Virginia Beach and three miles off the ocean side of the Eastern Shore, the Virginia Marine Resources Commission reports.

The brand-new fishery is notable: while shrimp is the most popular seafood in the United States, almost 90% of the shrimp eaten in the U.S. is imported, according to the ocean conservation advocacy organization Oceana.

Those imported shrimp mostly come from Southeast Asia and Central America, where they can be farmed in ponds that were once mangrove forests critical for capturing climate-altering carbon.

Global climate trends potentially have a lot to do with the reason the shrimp are now available in large numbers off Virginia — and, if the trends continue, in a few years, the waters off Maryland could be next, said Bradley Stevens, a University of Maryland Eastern Shore professor who holds a doctorate in fisheries science.

"I wouldn't say (the reason for the fishery's appearance) is

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Shrimping

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so much about shrimp, really,” Stevens said. “I would say this is an example of something occurring around the world right now.”

Not so surprising

Shrimp have always been found around the Chesapeake Bay, which is replete with the marshy, muddy habitat they love.

Shrimp like to bury in sediment and can be found in both the bay proper and its river estuaries, from shallow to deep water, said Troy Tuckey, an associate research scientist at the Virginia Institute of Marine Science.

Records of shrimp being present in low numbers in the bay date back to the 1880s, Tuckey said. However, those shrimp can never be fished in large numbers.

To catch shrimp economically, watermen use a beam trawl — a bucket-shaped net drug through the water by a horizontal beam — a fishing method banned in the Chesapeake Bay.

Beginning in the 1990s, surveys of the bay began more commonly turning up shrimp. That’s when researchers started counting them in earnest, Tuckey said.

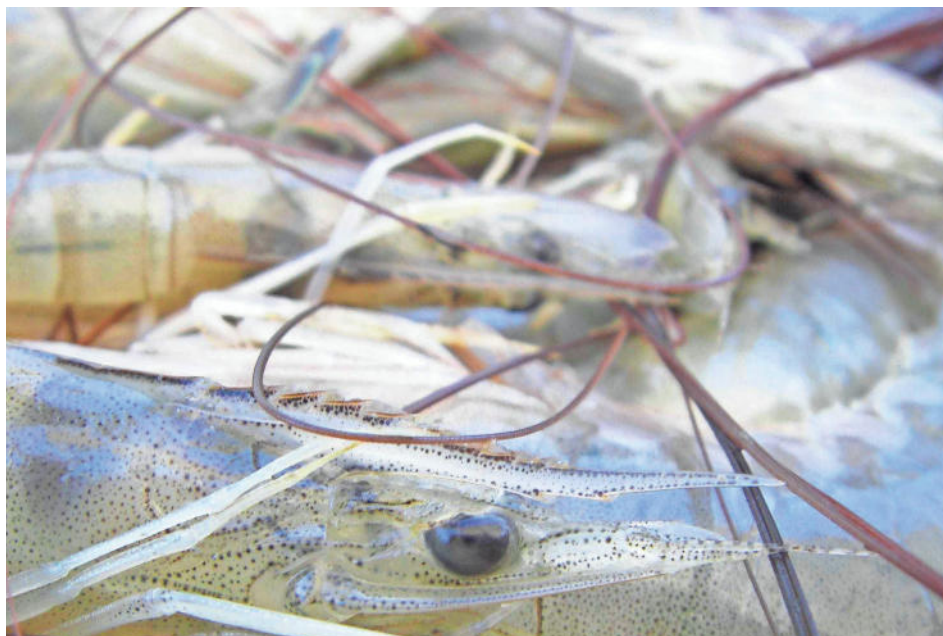
In the last decade, the bay’s shrimp population has really taken off, for several possible reasons: warming water temperatures, shifting winds and changing currents.

“I think it’s just a symptom of climate change in general and it’s not really all that surprising,” Bradley said.

Warming water temperatures are what’s behind a global phenomenon called a “poleward shift,” Bradley said. In response to increasing temperatures, many species are gradually moving away from the equator, where the Earth is warmest.

Hundreds of species have been documented making similar moves, from blue crab to sea stars, fish to crustaceans and bivalves, Bradley said. Over the last 20 years, species have been moving toward the poles at a rate of between 6-12 miles per year, he said.

That’s a lot, considering that before the turn of the millennium, those species had not moved much at all, Bradley



White shrimp are being harvested for the first time from an experimental fishery off the coast of Virginia. Warming water, changing currents and wind might all contribute to the fishery's appearance, biologists say. COURTESY OF VIRGINIA INSTITUTE OF MARINE SCIENCE

said.

The shrimp’s movement also has a lot to do with wind, said Christopher Davis, a fisheries biologist with the Virginia Marine Resources Commission.

Around the last week of October each year, a sudden drop in temperature drives the shrimp to funnel out of the bay and show up in the area of the experimental fishery, Davis said. The shrimp hang around on the ocean side of Virginia because the waters off the coast don’t see the same drastic temperature changes as the waters in the bay, he said.

Any shrimp caught and sold from this fishery represent a tiny fraction of the United States’ shrimp market.

From January through September 2019, the U.S. imported 494,964 metric tons of shrimp, mostly from India and Indonesia, according to statistics provided by the National Oceanic and Atmospheric Administration’s fisheries division.

The U.S. set its third consecutive importing record last year with almost 700,000 metric tons of shrimp coming into the country in 2018.

The U.S.’s domestic shrimp supply comes from the Gulf of Mexico and the south Atlantic, according to the American Shrimp Processors Association. American commercial fishermen netted

108,673 metric tons of white, pink and brown shrimp there in 2017, the most recent numbers available, according to NOAA.

By the end of 2019, the VMRC expects the six commercial watermen to collectively have harvested around 60,000-70,000 pounds of shrimp in the experimental fishery. That’s equivalent to just 27-32 metric tons — a small supply of the domestic shrimp said to have a distinctive taste.

“They are all very good to eat and I believe have a special quality because they come directly from Virginia waters,” Davis wrote in an email to The Daily Times.

Sorting out issues

The experimental fishery is being operated on a lottery system, with four permits granted to fish off Virginia Beach between Oct. 1 and Dec. 31, and two permits granted off the Eastern Shore between Nov. 1 and Dec. 31.

With so few shrimpers allowed out on the water, watermen with permits to fish did not want to be contacted for this story.

“They are all extremely hardworking individuals who put a lot of time and effort into being successful and fishing days last 10-11 hours each day,” Davis

This fall, six watermen have been granted licenses to trawl for much larger quantities of the succulent 4-8 inch shrimp in an experimental fishery.

wrote.

Part of the purpose of the limited-access, experimental fishery is to work out potential problems ahead of allowing more people to fish, Tuckey said. Normally, fishery managers are stuck with closing fisheries when there are problems; a limited opening allows the VMRC to first see if the fishery is viable, he said.

One of those issues is that shrimp trawling results in a lot of bycatch, or species appearing in the net that were not intended to be caught, Tuckey said. These can include Atlantic croaker, spot and summer flounder, he said.

Another pending issue is a disease called black gill, which some shrimp in the area are exhibiting, Tuckey said.

Poor water quality and a buildup of bacteria or fungus around the gill area will cause tissue to die, turning the gills black. While black gill does not impact the taste of shrimp or harm humans who eat them, it could impact the survival of the fishery, Tuckey said.

“If a lot of those shrimp are dying from black gill and it becomes a huge problem, you don’t want people to buy gear and plan on fishing and then have the fishery collapse,” Tuckey said.

The underwater ecosystem off the coast of Virginia will most likely see some effects from its newfound shrimp population, the scientists said. But exactly what will happen remains to be seen.

White shrimp consume a wide variety of plants and animals in their omnivorous diet, including algae, decaying organic matter, and other invertebrates, according to Oceana. And, in turn, many things will eat the shrimp.

All of these ecosystem changes can add up to a lot of difference in how carbon is delivered throughout the food chain, Bradley said.

“It can change a lot of things,” he said.

GOP

Continued from Page 1A

You can learn more on Facebook by visiting “Accomack and Northampton Republican Units” where a petition is posted with nearly 1,000 signatures along with other pertinent details.

How did we get here?

Rural counties across Virginia have mobilized to pass resolutions to become Second Amendment sanctuary counties in the past several weeks, encouraged by the pro-gun nonprofit Virginia Citizens Defense League.

The movement has come in the wake of Democrats taking control of the General Assembly come January and vowing to pass comprehensive gun control and gun safety bills.

Democratic Gov. Ralph Northam has said his party’s leaders will push for gun control measures.

Charlotte Gomer, a spokesperson for Virginia Attorney General Mark Herring, said recently that the attorney general expects all localities to follow the law if new gun control legislation ends up signed into law.

“It’s not clear what a Second Amendment sanctuary is, what its proponents are hoping to accomplish, or what authority they think they have to preemptively opt-out of gun safety laws, but if the Virginia Citizens Defense League is circulating it you can bet it’s a bad idea,” Gomer said.

Carroll County in April was the first Virginia locality to approve a resolution. The idea of a Second Amendment sanctuary gained traction after Democrats won control of the General Assembly; mere days after the election, Campbell County approved a resolution.

While the idea of a Second Amendment sanctuary is newer in Virginia, other cities and counties elsewhere in the U.S. — mostly in the western part of the country — have passed similar resolutions. Attorneys General in other states have indicated that sheriffs of sanctuary counties could face consequences for not enforcing the law.

The name “sanctuary county” takes a page out of the playbook of largely liberal cities who have named themselves as a “sanctuary city,” where officials have reacted to stiffer federal enforcement standards of immigration laws.

The Staunton News Leader, part of the USA TODAY Network, contributed to this report.

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White Marlin Open winner makes tournament history, 3B

EASTERN SHORE NEWS

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WEDNESDAY, AUGUST 14, 2019 ■ TASLEY, VA

PART OF THE USA TODAY NETWORK



OYSTERS IN PERIL

Oysters are having a tough year, and here's why

Julia Rentsch Salisbury Daily Times | USA TODAY NETWORK - DELMARVA

People, aside from oyster researchers and farmers, likely won't feel the impact for at least another 18 months. ■ But, eventually, everyone will know just how bad a year it has been for Maryland oysters. ■ Thanks to record levels of persistent rainfall throughout the bay watershed, salinity levels in the Chesapeake Bay have remained perilously low since May 2018. The absence of salt in the bay and its tributaries has been annihilating oyster spat production and oyster growth at hatcheries and farms around the region.

At the University of Maryland's Horn Point Hatchery, the largest oyster hatchery in the state, the carefully controlled operation is on course to produce hundreds of times fewer larvae this year than it would during a regular season, its manager said. This is bad news both economically and as an indicator of bay health, which data shows has suffered greatly under the deluge.

So far this year, the Cambridge hatchery has produced only about 6.5 million oyster spat-on-shell. That's 200 times less than last year, and almost 300 times less than the year before, said hatchery manager Stephanie Tobash Alexander, a senior faculty research as-

stant at the University of Maryland.

Researchers are quickly trying to discover the cause of the problem before the chance to produce more larvae has passed.

Oyster seasons can be variable, but this is the first time in 15 years that the hatchery will likely fail to meet its annual goal of putting 500 million spat-on-shell out into the bay, Tobash Alexander said.

The absence of spat this year is a looming specter over the oyster industry, which will begin to face harvesting difficulties in about 18 months to three years (the amount of time it

See OYSTERS, Page 2A



ABOVE: Stephanie Tobash Alexander, director of Horn Point Oyster Hatchery in Cambridge, holds an example group of young oysters on Aug. 2. AT TOP: Adult oysters are ready for spawning at Horn Point Hatchery in Cambridge, Maryland. Oysters are broadcast spawners, which means they release their gametes into the water; one oyster doing so can trigger the rest. PHOTOS BY JULIA RENTSCH /SALISBURY DAILY TIMES

\$10,000 repair approved for Northampton High School brick wall

Carol Vaughn Salisbury Daily Times
USA TODAY NETWORK - DELMARVA

A structural analysis found emergency repair is needed for a section of brick wall in the 1978 addition to Northampton High School in Eastville. The original part of the school was built in 1954.

"It was found that there was a section, over by the art room that is in emergency need of repair," said John Chandler, Northampton County Director of Finance.

The brick has come loose from the concrete masonry wall and is "bulging," according to the analysis by Waller Todd & Sadler.

The Board of Supervisors approved a budget amendment of \$10,000 to the schools' capital improvement budget to pay for the repairs.

"Let's get it fixed," Chairman Spencer Murray said.

"We are soliciting bids and as soon as we get three bids, whoever is the lowest one, as soon as they can mobilize the workforce, work will begin," said School Superintendent Eddie Lawrence.

Lawrence said the area needing the repair "is a small wall."

At a meeting with five architects and structural engineers, "four of the five indicated that there is nothing critically structurally bad" with the building, although it does need repairs, Northampton Board of Supervisors Chairman Spencer Murray said during a December 2018 report on the state of the county at an Eastern Shore of Virginia Chamber of Commerce event.

"The team is now considering how we would work those priorities," Murray said then, adding, "There will need to be a tax increase to fund it — there's no way around it — but the tax increase and any borrowing the county does along with that will be responsible."

He said the county will not do any financing arrangement that "will kick it out for future taxpayers and future board members. That's not ethical — I won't be a part of it, and I won't push the debt of Northampton County to \$90 million for future people to deal with."

With repairs, the high school could once again qualify to serve as an emergency shelter during high wind events, he said. Currently, Northampton residents are directed to go to a shelter in Accomack County during such emergencies.

It was in 2007 when structural conditions at the high school were first deemed very poor by visiting architects and the Virginia Beach-based structural engineering firm, Speight, Marshall & Francis P.C.

Following the structural investigation, temporary repairs were made.

On Twitter @cvvaughnESN
443-260-3314



Northampton High School in Eastville, Virginia. CAROL VAUGHN/SALISBURY DAILY TIMES

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Oysters

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takes an oyster to grow to a harvestable size).

This year's failed production has been humbling, Tobash Alexander said. Reaching out to colleagues and friends in various research fields for help hasn't provided any answers, she added.

"We've put our pride to the side; we need help," Tobash Alexander said. "There's something that, for some reason, our collective brains can't figure out when we have not changed a thing. Everything we're doing is what we did last year, what we did the year before and the year before that. So, it's got to be environmental. It's got to be something with the water."

Walking on a sponge

While weather each year on the bay varies, from July 2018 through June 2019, the bay watershed experienced more rain than has been recorded since record keeping began.

Much of the Chesapeake Bay watershed received 60-80 inches of rain during that time period, about 110% to 150% of normal, according to the National Weather Service. Importantly, the intensity was consistent, with Mother Nature delivering above-average rainfall in 10 of the last 12 months.

With so much rain, traipsing around in nature in the last year could be like walking on a soaked sponge. With the ground unable to take any more, the fresh water flowed straight into the rivers.

The runoff and flooding brought excess nutrients and sediments into the waterways feeding the bay, and the bay's overall health suffered significantly as a result, the Chesapeake Bay Foundation's 2018 "State of the Bay" report states.

As northern tributaries injected fresh rainwater into the bay, the amount of salt dissolved in the normally brackish bay water became severely diluted. The bay's salinity still hasn't recovered, with data from mid-June 2019 showing salinity just approaching the historical average range, the Virginia Estuarine and Coastal Observing System reports.

"There have been other years where there have been challenges. None have lasted as long as this," said Don Webster, an expert on commercial aquaculture development at the University of Maryland.

Oysters need salinity at 8-10 parts per thousand at minimum to survive, Tobash Alexander said. Normally at this time of year, the brackish water Horn Point brings in from the Choptank River would be 10-12 parts per thousand.

This year, it's at about a 7.

Horn Point salinates the water in which the oyster spawn grow, but it would be cost prohibitive to salt the adult oysters' water, which flows in and out of the hatchery back to the river, Tobash Alexander said.

When the adult oysters are under stress from low salinity, they put less energy into reproduction and more into pure survival, she said. Getting viable reproductive cells is harder when the oysters are just trying to stay alive.

Climate change modeling suggests the region will experience more frequent and severe storms in the future, and understanding those patterns will have far-reaching implications for bettering the bay's health, the Chesapeake Bay Program Science and Technical Advisory Committee found in 2008.

The situation is raising the question of whether the extra-wet year was a fluke, or if researchers and watermen should prepare their facilities to deal with these conditions more often.

Hatching oysters

Behind a metal gate and down a road lined symmetrically with large trees, research assistants, technicians and interns at Horn Point Hatchery lean over tanks filled with adult oysters ready to reproduce.

But in the high-ceilinged room dedicated to housing oyster larvae, many large plastic tanks stand empty of the greenish melange that would signify a growing batch of larvae.

The hatchery program at UMD has been in existence since 1974, but began its heyday after the Aquaculture and Restoration Ecology Laboratory was constructed in 2003. It produces oyster larvae mainly for research, restoration and education, but a portion also



ABOVE: Stephanie Tobash Alexander, director of Horn Point Hatchery in Cambridge, holds up an example of adult oysters in the wild.



LEFT: A recycled oyster shell bearing coffee grain-like spat, the name used for oyster larvae once they have glued themselves onto a substrate.

PHOTOS BY JULIA RENTSCH /SALISBURY DAILY TIMES

goes to public and private fisheries for harvesting.

Since then, the facility has dramatically increased its oyster production: in its 2016-17 season, Horn Point Hatchery produced 1.8 billion spat-on-shell, its record to date.

"In 2017, we probably could have done 2 billion," Tobash Alexander said. "But we literally ran out of bottom. ... So we stopped the hatchery early that year."

Last year, conditions were also less than ideal, with low salinity beginning to affect the process in May. But because of the normal spring, the facility still produced 1.3 billion spat-on-shell, Tobash Alexander said.

Most of the spat-on-shell Horn Point Hatchery produces goes to a Chesapeake Bay restoration program. According to the National Oceanic and Atmospheric Administration, harvests of oysters are now at 1% or less of historical levels due to harvesting, disease and changes in water quality, among other factors.

With diminishing overall oyster populations, the ecosystem services they provide are similarly reduced. Each adult oyster can filter up to 50 gallons of water a day, straining algae from the water as food.

Oysters are the "coral reefs of the bay," Tobash Alexander said, since oyster bars provide habitat and food for many types of marine plants and animals. Because other species in the bay ecosystem depend on oysters performing their role, they are considered a keystone species.

Some years, Horn Point sends larvae to private oyster growers who seed public oyster bars and private farms that grow oysters for the half-shell market. Whether they are able to do this depends on the sources of the hatchery's funding, Tobash Alexander said.

At the hatchery, adult broodstock oysters are kept in water cool enough to discourage them from releasing their eggs or sperm until they are ready for spawning. Once a group of adults is conditioned, they are transferred to warmer water and made to release their gametes.

Once fertilized, the eggs are transferred to 15-foot tanks, where they feed on hatchery-grown algae until they are large enough to affix themselves onto a substrate. In the hatchery's case, this is recycled oyster shell, either whole or ground up into a sand-like texture called cultch.

The affixed "spat-on-shell" gets transported to sanctuaries in the bay for oyster restoration. For harvest oysters, the hatchery sends growers unattached larvae that they may set on shell and plant in the bay themselves.

While the freshness of the water is likely driving the production problem, it may not be the only cause of this particularly bad oyster year, Tobash Alexander said. The stress caused by low salinity could be making the oysters more vulnerable to another type of problem, so technicians at Horn Point Hatchery have been experimenting with various possible new angles.

"It's pretty much looking for a needle in a haystack, so we're just going through pulling out little pieces of straw, testing every parameter we can think of," Tobash Alexander said. "My gut tells me it's not a simple answer."

Market forecast

For more than a century, oysters have made up one of the Chesapeake Bay's most valuable commercial

fisheries alongside blue crab, striped bass and Atlantic menhaden. In 2017 (the most recent data available), Chesapeake watermen landed over 4.3 million pounds of oysters valued at \$55.7 million; of that, about 660,000 pounds worth \$10.3 million were landed in Maryland, according to NOAA.

For Eric Wisner, who farms about 600 acres on the Nanticoke River and normally receives larvae from Horn Point, a low larvae production year meant he needed to find a new supplier.

Except there aren't that many new options to turn to, especially in Maryland, Wisner said. That leaves out-of-state hatcheries, which are hard to get larvae from due to their commitments to their established clientele, he said.

"They're already geared up to produce a certain amount of larvae ... they can't just double their production all of a sudden when there's a demand for it," Wisner said.

Wisner managed to get a small amount of larvae from a hatchery in Virginia, but is paying twice his usual price, he said.

In two to three years, when the fruits of this meager planting are turned into a small harvest, the effect on his business will likely be in the neighborhood of \$100,000-\$200,000, he said.

While it's not precisely clear how much of an increase market forces will dictate on oyster prices for the consumer, Marylanders looking for half-shell should expect to begin paying a premium beginning in 2021.

The shortage has affected businesses up and down the bay.

For Maryland Watermen's Association President Robert T. Brown, who with his wife, Victoria, owns Shop Cove Aquaculture on St. Mary's River, the shortage means an inability to fulfill oyster planting contracts with the state under the Oyster Recovery Partnership.

Four million Horn Point larvae usually result in 1 million to 1.5 million successful spat-on-shell, Robert T. Brown said. The bad growing conditions have meant the business has not been able to fulfill a single contract in the last two years, Victoria Brown said.

"It takes three years for an oyster to grow, so this has put us back," she said. "So what we planted three years ago ... a lot of it died. We lost over 50% on a lot of our pieces."

When Maryland first began to develop a large-scale sanctuary network around 10 years ago, it was promised to the public that the sanctuaries would help farmers by putting off natural larvae into the public waterway, Victoria Brown said.

Outside of high-salinity areas, this has not happened, she said.

"I have planted oyster on bottom for over six years. I have yet to have one natural spat set on any of our leases," Victoria Brown said. "So, it's not working."

Researchers at Horn Point Hatchery recognize their important role in keeping the wheels turning on oyster restoration in the bay. While limited by resources and funding, experiments at Horn Point seek a greater understanding of the challenges oysters face to thrive.

No one is certain of when the rain will slow and salinity will return to normal. All are looking forward to the day oysters begin to bounce back.

"But our season's not over yet," Tobash Alexander said. "We're not throwing in the towel. We're trying to be positive that we'll be able to produce something."

Obituaries

Regina Dickerson

HORNTOWN - Regina W. Dickerson, 84, of Horntown, departed this life on Sunday, August 4, 2019 at Peninsula Regional Medical Center in Salisbury, Maryland.

Born in Pocomoke City, Maryland, Regina was the daughter of Harvey and Elsie Waters. She was united in holy matrimony to John "Jack" Dickerson on May 28, 1953. Regina began working in the poultry industry. Also, she ran the "Dickerson Texaco" located in the heart of Horntown. Upon the closing of the store, she became a US government inspector for Perdue Farms in Accomac. After retirement from Perdue Farms, she became the "lunch lady" for the Accomack County School System.

Funeral services were held at New Beginnings U.M. Church, Wattsville, on Saturday, August 10, 2019. Interment was in the Dea's Chapel cemetery, Horntown, Virginia.

Regina leaves to cherish her memories: her children, Jeffery Dickerson, Kathy Miller, Gary Cropper, and Kimberly Pough; four grandchildren; four great-grandchildren; two brothers, Harvey Waters Jr., and Franklin Waters; two sisters, Edna Waters and Gladys McNeil; three brothers-in-law; four sisters-in-law; and a host of nieces, nephews, extended family members and friends.

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