EAST COAST SHELLFISH GROWERS ASSOCIATION



The East Coast Shellfish Growers Association represents over 1,000 shellfish farmers from Maine to Florida. These proud stewards of the marine environment produce sustainable, farmed shellfish while providing thousands of jobs in rural coastal towns.

The ECSGA informs policy makers and regulators to protect a way of life.

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The Mouth of the Bay In This Issue



the bottom of this page I provide a brief update on our political initiatives and the

Executive Director latest budget **Bob Rheault** updates from

Washington, D.C. We are making good progress on our efforts to add aquaculture crops to the Farm Bill definition of specialty crops. This would make our growers eligible for small research and marketing grants and should open the door to better crop insurance options.

Our board is now considering pushing for a legislative carve-out

by Robert Rheault,

ECSGA Executive Director

The ECSGA board has been quite

busy on a number of fronts, and

we have plenty of good news to

report. Several of the initiatives

we brought to D.C. at the end of

February are starting to bear fruit.

For several years now we've been

defined as a specialty crop under

the Farm Bill. Since we came up a

few votes short on an amendment

back in 2013, this year we decided

working to include all aquaculture

to broaden the appeal, so we are

crops. We now have 20 associa-

tions supporting us in this effort,

including the Pacific Coast Shell-

fish Growers Association, Na-

tional Aquaculture Association,

National Fisheries Institute and

We're expecting the Farm Bill

to come up for reauthorization

in 2018. If we can get our lan-

guage inserted, it would make our

products eligible for small grants

that could be used for marketing

and research. More importantly,

specialty crop status would help

the USDA develop better crop in-

many other groups.

trying to get farmed shellfish

that would exempt shellfish farmers working in state waters from the requirements of the Jones Act, which calls for complicated and expensive insurance requirements and exposes growers to potential lawsuits from injured workers. The Jones Act was created to protect seamen on vessels operating outside of state waters, and we believe that workers' compensation insurance should provide adequate coverage for employees working in inshore waters.

We also have three articles describing presentations given at the Northeast Shellfish Sanitation Association (NESSA) annual meeting in Freeport, Me., in April. These regional annual meetings give states an opportunity to compare notes, examine trends and learn about research, monitoring and enforcement actions in the region. At the NESSA meeting we learned about continuing declines in confirmed Vibrio illnesses



surance options for our products. Our political action committee is also looking at a potential legislative carve-out to exempt shellfish growers operating in state waters from the Jones Act, which was created to protect seamen injured at sea. For in-shore farming operations we believe that employees are better covered under workers' compensation insurance, and that requiring growers to have coverage for both constitutes an unnecessary hardship.

We also continue to push toward resolving the trade embargo preventing us from selling shellfish in the European Union. A letter bearing 10 congressional signatures was sent on April 28 to Dr. Nega Beru, Director of the Office of Food Safety at the Food and Drug Administration (FDA). In

in Northeast states, covered in an article from Andy DePaola, who describes the trend on page 4. At that meeting I gave a presentation on communicating with the media and how different sets of facts can have vastly different impacts on markets and consumer confidence. (See article on page 8.)

Much of the meeting was devoted to learning about the harmful algae Pseudo-nitzschia, which can produce domoic acid (the causative agent for Amnesic Shellfish Poisoning). Pseudo-nitzschia blooms forced large closures from Maine to Rhode Island this past year, as described by Kohl Kanwit on page 3.

Lastly, Vibrio season is upon us again. Keep 'em cold and avoid costly closures and recalls! Spring was chilly, but we can expect a return to record-breaking heatprobably by the time you read this.

that letter they urged the FDA to resolve the seven-year-old dispute and to lay out a plan for allowing all shellfish-producing states to sell to the EU. Considering we were told over a year ago that all the technical obstacles had been resolved, it is hard to understand why the rulemaking process is taking so long.

When we went to D.C. we also asked our elected representatives to preserve funding for programs such as NOAA's Sea Grant, the Office of Aquaculture at the National Marine Fisheries Service (NMFS) and aquaculture research capabilities at the Milford Lab.

Despite the president's threats to slash these programs, it appears that we did pretty well in the FY17 budget that just passed. The Sea Grant program emerged unscathed and the Sea Grant Marine Aquaculture Program got a small bump. The NMFS aquaculture program received a \$3-million boost to \$9.3 million. The Senate budget committee also included specific language instructing NMFS to strengthen the aquaculture research capacity at the Milford Lab and directed NMFS to spend \$1 million on off-bottom oyster culture research.

ECSGA NEWSLETTER **I**SSUE 2 **J**UNE 2017 PAGE 1

Rhode Island Shellfish Initiative Launch

by Robert Rheault, ECSGA Executive Director

In 2011, the National Oceanic and Atmospheric Administration (NOAA) established the National Shellfish Initiative to increase populations of bivalve shellfish—including oysters, clams, abalone and mussels—in our nation's coastal waters through both sustainable commercial production and restoration activities.

NOAA's initiative was designed to bring attention to the broad suite of economic, social and environmental benefits provided by shellfish, including: jobs and economic development; sustainable domestic seafood; habitat for juvenile fish, crabs and forage species; water quality and nutrient uptake; and shoreline protection.

In the wake of the rollout of the national initiative, many states have followed suit with initiatives of their own. Washington was the first in

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2012, when the governor seated a blue-ribbon Ocean Acidification Panel, and they stepped up efforts to restore the native Olympia oyster and improve water quality in several key growing areas. NOAA helped fund a restoration hatchery, while other federal partners stepped in to resolve longstanding permitting roadblocks.

Following this example, Alaska completed the first phase of its initiative, California, Oregon and Connecticut started initiatives in the past year, and several of the Gulf and Southeast states are planning state or regional efforts. Rhode Island

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Director, Business Development

celebrated the launch of its shellfish initiative on April 24 at an event with plenty of fanfare and a full slate of dignitaries who offered comments and brought items to put in a time capsule that will be opened in 10 years.



<image>

JESSICA VESCERA Rhode Island Governor Gina Raimondo's donation to the time capsule at the launch celebration of the R.I. Shellfish Initiative was a photo of herself and her family digging for quahogs. of meetings the Rhode Island SMP effort successfully brought together the various regulatory agencies to resolve turf issues and to streamline permitting, while getting wild harvesters, environmental groups and shellfish farmers together to identify common goals and obstacles to growth.

The group developed "user maps" to mitigate potential user conflicts with proposed leases, while state water-quality managers held workshops to help harvesters understand area-closure and reopening criteria. Every-

one came out of these meetings with a better appreciation for members of the other sectors. Together these groups prioritized pages of recommended actions and research needs, and mapped out a path to work through the list.

The Rhode Island Shellfish Initiative was viewed as a mechanism to maintain the momentum of the SMP effort, a public–private partnership to raise awareness about the value of shellfish resources to the state's economic, educational, cultural and environmental assets. We still have a long list of priority actions to tackle, and while the pace of meetings has thankfully slowed, there is still broad enthusiasm for the project's goals. We decided that rolling out a state initiative would be the best way to shine a bright light on all the positive things that shellfish bring to the Ocean State.

The executive summary reads:

The Rhode Island Shellfish Initiative honors the legacy and vital role shellfish play in supporting our environment, families, traditions, and economy. Through a partnership of government, business, academia, and community, the Initiative will strengthen our state's shellfish management practices and promote growth and innovation within our local seafood industry.

- Continued on page 7



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Biotoxins at the NESSA Meeting

by Kohl Kanwit, Director, Public Health Bureau, Maine Division of Marine Resources

The second day of the Northeast Shellfish Sanitation Association (NESSA) meeting in Freeport, Me., was almost entirely focused on biotoxins, with an emphasis on the recent *Pseudo-nitzschia* events in the Northeast. *Pseudonitzschia* is a sometimes toxic family of phytoplankton that can cause Amnesic Shellfish Poisoning (ASP), which was first discovered in the 1980s when an illness outbreak occurred in eastern Canada, involving more than 200 cases and three deaths. Dr. Mark Wells of the University of Maine, School of Marine Sciences, kicked off the day with a talk titled, "Toxigenic *Pseudo-nitzschia:* The Teenager in the Room."

Dr. Wells has spent much of his career studying Pseudo-nitzschia on the West Coast, including the devastating bloom in 2015 associated with the warm-water "blob" that closed bivalve shellfish and crab fisheries from Washington to California. He proposed an interesting hypothesis on why the Pseudo-nitzschia bloom in eastern Maine produced high levels of toxicity in the fall of 2016. Dr. Wells and others have suggested that Pseudo-nitzschia only produces toxins when it is stressed by iron or nutrient limitation. The diatom is often found in our waters, but only rarely do we see it produce the domoic acid toxin. More research is needed to fully understand the dynamics influencing this new biotoxin challenge.

Presenters from the three Northeast states impacted in the 2016 *Pseudo-nitzschia* fall bloom

spoke as well, highlighting how the event unfolded, including closures, recalls and testing methods. The 2016 Pseudo-nitzschia event started in far eastern Maine (actually in the Bay of Fundy in Canada) and quickly moved west toward Penobscot Bay. Maine monitors phytoplankton and routinely sees Pseudonitzschia in the 10s of thousands of cells per liter, but has never experienced toxicity above $12 \,\mu g / 100 g$ in shellfish tissue. The closure limit is 20 μ g/100g as established by the National Shellfish Sanitation Program.

The first samples processed after phytoplankton counts went above 15,000 cells/liter were over 80 $\mu g/100g$ in shellfish tissue. The Maine Department of Marine Resources (DMR) implemented large closures over the following days, resulting in most of eastern Maine's being closed to the taking of all bivalves. The rapid closures also triggered a recall of 11,000 pounds of product, and testing of other species such as crabs and lobsters. As Maine was dealing with their ASP event, Rhode Island was observing Pseudo-nitzschia cell counts in



NOAA FISHERIES

Pseudo-nitzschia are naturally occurring marine algae that sometimes produce a potent neurotoxin called domoic acid. The toxin can cause Amnesiac Shellfish Poisoning (ASP) resulting in temporary, or even permanent, memory loss.

the millions of cells/liter. Based on what was occurring in Maine, both Rhode Island and Massachusetts authorities initiated precautionary closures and started testing shellfish.

Toxin levels in the Rhode Island/Massachusetts bloom did not exceed the closure limit and areas were reopened. Research conducted by Maine's Bigelow Laboratory for Ocean Sciences and the Woods Hole Oceanographic Institution determined that the two blooms were distinct. Although they were both *Pseudonitzschia*, the Maine bloom was dominated by a previously undocumented species called *Pseudonitzschia australis*, known to be toxic at low cell counts. But the *Pseudo-nitzschia* bloom in Rhode Island and Massachusetts was dominated by a more commonly observed and sometimes toxic species, *Pseudo-nitzschia pungens*.

Other topics of the day included an overview of the biotoxin challenges in Washington state, where they routinely deal with both Paralytic Shellfish Poisoning (PSP), ASP and Diarrhetic Shellfish Poisoning (DSP).

Maine presented on their "phantom" DSP event in 2016, when closures were implemented based on a testing kit that provided false positive results. This experience illustrated the need for good, proven methods for all biotoxins the region might encounter. (Note: There is currently no approved method for DSP testing in the National Shellfish Sanitation Program).

Finally, a good deal of time was spent on a review of the various states' phytoplankton monitoring programs, when and how samples are collected, how plankton or biotoxins are quantified and how resource managers are working to minimize the risk to consumers.



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Good News Department: Vibrio parahaemolyticus Illnesses Decline in NE

by Andy dePaola

At a recent meeting of the Northeast Shellfish Sanitation Association (NESSA) in Freeport, Me., the *Vibrio parahaemolyticus (Vp)* news was encouraging. The numbers of *Vp* illnesses linked exclusively to shellfish in the Northeast continued to drop for the third consecutive year, with no illnesses reported in New Hampshire or Rhode Island, one each in Connecticut and Maine, two in New York, three in New Jersey, and 10 in Massachusetts. These declines are correlated with the unprecedented public-health success of rapid-cooling controls on oyster harvesting that bagan in 2014.

The turn-around in the region came after major growing areas in Connecticut, Massachusetts and New York were closed for extended periods in 2012 and 2013 due to spikes in Vp illnesses. Since that time, no disruptive recalls have occurred, with 2016 marking the first year without a closure due to Vp illnesses. The

shellfish safety community is applauding control authorities and industry members from the region for their accomplishments.

When Bob Rheault asked me to write about this amazing story from my perspective as a retired research microbiologist and national *Vibrio* policy coordinator for the Food and Drug Administration (FDA), I was delighted to oblige. Although I have authored or co-authored over 100 scientific articles, including numerous *Vibrio* outbreak responses, this is my first article for the general public.

My work has taken me to

many shellfish growing areas around the country, but my first visit to the Northeast fell on an icy cold December morning in 2013 at Norm Bloom's oyster operation in East Norwalk, Conn. As the FDA's *Vibrio* policy coordinator, I had been making the case for a more robust program that would connect all stakeholders. Be careful what you wish for!



on the ton new *Vibri* especially to cool or one hour *Vibrio* rish to occur,' son." In ginia and control au industry I on-board its feasibi nothing I other stat

Andy DePaola demonstrates smallscale rapid cooling of oysters on his 12' boat behind the FDA lab on Dauphin Island, Ala., in 2013.

Connecticut was the last stop on the tour to explain FDA's new Vibrio policy initiatives, especially a proposed mandate to cool oysters to 50°F within one hour of harvest "when a Vibrio risk is reasonably likely to occur," aka "Vibrio Season." In previous trips to Virginia and Washington, state control authorities and the industry had not supported on-board cooling, questioning its feasibility and cost. But nothing I had seen in those other states could compare to what I experienced that day in Connecticut.

The entire premise of my visit was different, mostly because

I was actually invited. Regulators wanted to implement an immediate-cooling requirement similar to the FDA proposal to the Interstate Shellfish Sanitation Conference (ISSC), and they wanted the FDA's help. I came with three other FDA officials, and after a brief tour of Norm Bloom's plant, his son, Jimmy, brought us out a few miles to one of their leases. In 15 minutes he dredged up a mound of oysters taller than me—a scale of harvest beyond my imagination!

Just a few months earlier I had been preaching about ice slurries and demonstrating how to cool oysters in buckets aboard a 12' boat for Gulf control authorities and industry members. So when Jimmy Bloom asked me how to apply ice-slurry cooling to this operation, my only response was "you might try a swimming pool." Ironically, as we pondered this dilemma an

> ice slurry spontaneously formed around the mountain of oysters as it was drenched with freezing cold seawater.

Later that afternoon I attended a meeting to roll out the 2014 Vp control plan to the Connecticut industry and the state's Commissioner of Agriculture. The meeting hall was packed with industry members from Connecticut and neighboring states. It seemed to be going pretty well until the scientific presentations ended and I started taking questions. Typically, there would be only a few, if any, questions-obviously, this was not going to be typical! About two hours later when I rushed out to catch a plane home, many hands were still raised.

In 2012 the state's waters had been closed as a precautionary measure after the introduction of the invader V_p strain (O4:K12) from the Pacific Coast. The extended closure and disruptive recalls that followed in 2013 had been very painful and demoralizing. In spite of the more stringent time-

- Continued on page 5



DRONE PHOTO COURTESY JIMMY BLOOM Large-scale rapid cooling of harvested oysters at Norm Bloom and Son in Norwalk, Conn. Each of six insulated containers on the deck of the harvest vessel is pre-filled with 6-8 totes of ice. Seawater is then pumped in to make a slurry.

temperature controls mandated that year, cases of V_p illnesses had skyrocketed, threatening many livelihoods. Facing such an uncertain future the industry was scared and in no mood to drink the Cool-aid we were serving!

In spite of a well organized and passionate resistance from the industry, the Conn. Dept. of Agriculture courageously stood by its plan to mandate rapid-cooling controls for the 2014 *Vibrio* season. This high-stakes experiment put my scientific reputation, and possibly the jobs of some state officials, on the line. But most importantly, the future of the region's oyster industry was hanging in the balance.

The data clearly showed that *Vibrios* proliferate exponentially in oysters until they are chilled. Two nationwide market surveys revealed that the levels of Vp and *Vibrio vulnificus* (Vv) during the summer months were often 100 times greater than harvest levels. However, when the Gulf states adopted more stringent time– temperature controls in 2010, Vv illnesses had actually increased. Even though widespread noncompliance was evident in some states, the credibility of the science underpinning the VvRisk Calculator was cast in doubt—does risk

increase proportionally to post-harvest growth? Verifying compliance would be essential for the Connecticut experiment to bring clarity to this crucial assumption for *Vp*.

One month later, the ISSC biennial meeting in San Antonio turned into an unmitigated FDA bashing. An oft-heard refrain was, "if it's from FDA it is DOA." This erosion of trust was largely sparked by FDA's attempt to bypass the ISSC and unilaterally mandate post-harvest processing (PHP) in Vv control states during the Vv risk season. As a result, immediate cooling and most of the other FDA proposals took a total beat-down.

But there is nothing like a major crisis to motivate cooperation. The policy, regulatory and research arms in FDA began regular conversations to better define the agency's *Vibrio* position and to develop outreach plans. We began to connect more cohesively with state

control authorities, NOAA, the Centers for Disease Control and academia. But the key to implementing time-temperature controls for preventing Vibrio proliferation would have to rely on the actions of the most critical Vibrio risk managers: the shellfish growers and dealers who handle product after it's harvested.

As a research scientist, I would conduct studies, analyze data and make recommendations. The scientific findings would move up my chain of command to the microbiology supervisor, lab director and then to the policy director in College Park, Md. Then information moved down the policy chain, where it was transferred to an FDA Regional Shellfish Specialist (RSS). The RSS would share with the appropriate state point-of-contact and the information would continue down the command chain to the state employee who would present it to industry. But many times that state employee was relatively new to the Vibrio world and was less knowledgeable than many of the industry members. The science had suffered from dilution and corruption as it moved away from the source, and was no longer credible by the time it was delivered to the ultimate risk managers: the harvesters and dealers.

We stayed in close contact with Connecticut authorities as the 2014 *Vibrio* season kicked off. At first, key industry members were reluctant to use ice onboard harvest vessels, but after a few pioneers tried this approach, the rest of the industry soon followed. Kristin DeRosia-Banick of the Conn. Department of Agriculture demonstrated amazing grace and skill in working with a reluctant industry in implementing a novel program.

Onboard icing of shellfish at the point of harvest had never been attempted before anywhere on any scale. This was particularly challenging given that Connecticut's oyster industry ranged from one of the largest harvester/dealers in the U.S. to small mom-and-pop operations. Cooling that is too rapid or too cold shocks oysters and can be lethal—dip should be 40°F. DeRo-



DRONE PHOTO COURTESY JIMMY BLOOM Dredges full of oysters are dumped into the cage lining the container of ice slurry. After around seven minutes the drain plug is pulled and oysters are cold.

sia-Banick conducted experiments and advised the industry on ratios of ice to oysters, along with appropriate exposure times in ice slurries to reach target temperatures. She worked relentlessly to develop unprecedented systems for validation and verification of the cooling protocols of each industry vessel. As a result, only a single *Vp* case was linked to Connecticut shellfish in 2014, and no closures or recalls were ordered. Everyone was a winner!

Oyster Bay, N.Y.

In 2012 Long Island's Oyster Bay had been ground zero for the introduction of the invader Vp strain from the West Coast, and became a major source of illnesses in 2013. During my initial visit there in May 2014, on the day before scheduled meetings with state authorities. I went down to the docks where harvesters were already landing clams on ice on that chilly day. Without revealing my FDA affiliation, I was pleased to hear the various industry perspectives on the importance of Vibrio control. When we went out with New York control authorities the next day, Yankee ingenuity was in full swing. Some small boats were equipped with mechanical freezers, and almost every configuration of shellfish cooling

— Continued on page 12



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Continued from page 2 Rhode Island Shellfish Initiative

Being a small state we were lucky enough to have our entire congressional delegation and a host of state dignitaries come speak at the

event. Senator Jack Reed, who had been instrumental in obtaining funds for a 2002 aquaculture initiative that helped jumpstart Rhode Island's nascent aquaculture industry, recalled that, "in 1996, there were just six aquaculture farms in Rhode Island. In 2016, there are 70 farms, which employ 177 people and cultivate 275 acres.

"To get here, it's been a team effort ... But now, these are slightly different times. When you have a proposal to eliminate Sea Grant... we are now playing a little defense. But we're going to do our best. Because these programs are not just about the environment. The tourist industry also depends fundamentally on what you do. **It's about our economy, about growth and an opportunity to put people to work,**" he said.

Senator Sheldon Whitehouse, who has been leading the charge in Congress to bring attention to issues of climate change, pointed to the potential risks of ocean acidification and how shellfish larvae and corals struggle to form shell



Rhode Island's senior Senator, Jack Reed, attended the Rhode Island Shellfish Initiative launch celebration and brought a copy of Rhode Island's Shellfish Heritage for the time capsule. sional delegation are "working in lockstep making sure our researchers, colleges and universities continue to have the resources they need to continue to do their work."

in acidified waters, reminding his audience,

cuts to research funding, Congressman Jim

Langevin said that Rhode Island's Congres-

Acknowledging the administration's proposed

"No shells, no shellfish."

NOAA Fisheries' Deputy Assistant Administrator for Operations Paul Doremus, noted that "there are only so many wild-capture fishing products that we can harvest sustainably from the ocean. We have population growth and demand and a public need for sustainable seafood far in excess of what we can produce out of our wild-capture fisheries, and aquaculture is the

Rhode Island Governor Gina Raimondo expressed her hope that the state would be able to "support efforts to modernize

infrastructure to support commercial fishing... invest in research and innovation... improve the health of [Narragansett] Bay...and expand on the Rhode Island seafood brand."

answer to that."

As the closing speaker for the launch event I pointed out how the state's SMP effort had suc-



BOB RHEAULT

After the ceremony guests at the launch celebration were treated to a raw bar of oysters and quahogs sponsored by the Matunuck Oyster Bar and the R.I. Shellfishermen's Association. (I to r) Lane, Percy, Cindy and John West; Perry Raso; and Dylan Thompson did the shucking.

ceeded in getting disparate groups with varied agendas to come together and pull on the same oar. We were able to streamline regulations and find synergies among the many groups working on water quality, seafood marketing, shellfish restoration, and commercial and recreational harvests. I noted that wild harvesters and shellfish farmers have learned that we share far more in the challenges and opportunities that unite us (whether it is global markets, regulations, climate change or a willingness to stand all day in a skiff) than in the petty differences that divide us.

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ECSGA NEWSLETTER ISSUE 2 JUNE 2017

Allen-Bailey

Alternative Facts

by Robert Rheault, ECSGA Executive Director

At the April meeting of the Northeast Shellfish Sanitation Association (NESSA) in Freeport, Me., I gave a presentation titled, *Use of Press.* It was a cautionary tale to regulators and researchers about how a poor choice of words can be highly damaging to our industry. I was not asking anyone to lie or even twist the truth, but rather I was asking that they use alternative factual information that presents our industry in a more favorable light. One might call them "Alternative Facts."

I offered the premise that it is not in anyone's best interest to throw our industry under the bus if they ever want us to work with them, or if they even want us to relate to them in an atmosphere of mutual respect. We may not need to like each other, but we shouldn't be lifetime enemies either. When we operate in an atmosphere of mutual respect we can expect growers to self-regulate to some degree, because they don't want their competitors to get away with something they can't. Being at war with industry will have a different set of outcomes. I offered several examples showing how two sets of facts could present similar information with drastically different impacts on consumer impressions and shellfish markets. For instance, you could say, "There was a spill of raw, untreated sewage and we closed the harvest area due to fecal pollution. Cook all your shellfish just to be safe."

Alternatively, you could say, "Heavy rainfall triggered a routine harvest area closure. Rest assured, all shellfish on the market is safe. Closures are a sign that our surveillance system works." Both of these are factual statements.

For a Red Tide you might put out a news release saying, "We closed the harvest area due to Red Tide. Symptoms include vomiting, diarrhea, amnesia and death."

On the other hand, you could say, "Routine sampling detected the presence of harmful algae and triggered a harvest area closure. Closures indicate that our surveillance system is effective. Rest assured, all shellfish on the market comes from unaffected areas and is safe. In the U.S. we have not had a harmfulalgal-bloom-related illness from commercially harvested shellfish in 30 years."





ROMAN KRAFT

I then shared a recent news release issued by the University of New Hampshire that was picked up by dozens of publications. It stated that, "*Vibrio parahaemolyticus [V.p.]* is the leading seafood-transmitted bacterial pathogen worldwide with an estimated 45,000 infections in the United States every year, according to the CDC [Centers for Disease Control]. It causes gastroenteritis and, rarely, lethal septicemia."

Some notable facts about the 45,000 infections not mentioned in the press release, but that would have put the number in perspective: that figure was extrapolated from an estimated 287 lab-confirmed, foodborne *V.p.* illnesses annually in the U.S. The authors, Elaine Scallan et al., (see end note) estimated under-reporting and under-diagnosis to project the 44,950 illness figure. It is worthy to note that this estimate includes massive error bars. The 90-percent confidence interval has a range of 23,706 – 74,984. (I suspect that the authors used a 90-percent confidence interval because a 95-percent

— Continued on page 9

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Continued from page 8 Alternative Facts

confidence interval would have been laughably large!)

One alternative choice of facts that could have been offered in the press release would have left the public with a very different impression, and would have had far less impact on our markets:

"There are a few dozen confirmed *V.p.* illnesses in New England associated with shellfish consumption each year. Harvesters and regulators have worked together aggressively to address the problem, and the rate of illness per serving is on the decline. Despite the fact that oyster production in New England has doubled in the past five years, and that consumption during the summer months is more popular than ever, illness rates are on the decline. Industry has invested mil-

lions in new coolers, ice machines and reefer trucks to ensure product safety. Consumers can do their part by keeping shellfish cold on the ride home from the market."

I also offered some "alternative facts" that regulators might employ when discussing a norovirus outbreak:

"Norovirus is the leading cause of foodborne illness in the U.S., but the vast majority of cases are traced to raw vegetables or fruits, commonly involving a food worker with poor hygiene. Unlike much of the developing world, in the U.S. we do a good job with sewage treatment. Of the 780 norovirus-related outbreaks reported between 2011 and 2013, only 250 implicated a specific food source, and only five of those were linked to oysters. (See wwwn.cdc. gov/foodborneoutbreaks) I summed up by noting that the choice of which facts regulators and researchers present to the press is up to them. Indeed, if they are writing a grant proposal they should feel free to make their subject sound like a HUGE public health crisis. But when they are talking to the media, I suggested that the assembled health professionals should be cognizant of the impacts of their choice of facts on our markets and our industry.

End Note:

Foodborne Illness Acquired in the United States—Major Pathogens. Elaine Scallan, Robert M. Hoekstra, Frederick J. Angulo, Robert V. Tauxe, Marc-Alain Widdowson, Sharon L. Roy, Jeffery L. Jones, and Patricia M. Griffin. Emerg Infect Dis. 2011 Jan; 17(1): 7–15.

www.ncbi.nlm.nih.gov/pmc/ articles/PMC3375761



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TAYLOR LEAR PHOTO Some of the oyster-lovers who ate and drank like kings and queens at a 25,000-square-foot manufacturing-warehouse-turned arts-center in Red Hook, Brooklyn.

The fourth annual Billion Oyster Party held at Pioneer Works in Red Hook, Brooklyn, N.Y., on May 18 raised around \$285,000 to help restore a sustainable oyster population in New York Harbor. Staff from 50 oyster farms and 20 of New York City's finest restaurants, along with volunteers, students and teachers from the New York Harbor School, put on a vast, movable seafood feast.

Growers from different farms and different coasts had a chance to meet in person, talk shop and sample each other's products.

Proceeds from the event will support the four program areas of the BOP: Oyster Production, Reef Construction & Monitoring, Shell Collection, BOP Schools, and Public Engagement.



TAYLOR LEAR PHOTO Roughly 1200 people (around 800 of them guests) ate 30,000 oysters and had a blast.



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- Continued from page 5 Vibrio Illness Declines

imaginable was on display—Cool-aid has many flavors. Oyster Bay clams were linked to only a single case of illness in 2014, and no cases were linked to oysters. But an adjacent area that had not adopted on-board cooling requirements was closed due to illnesses. On-board cooling requirements were implemented there the following year.

Massachusetts

Numerous illnesses continued to be associated with Massachusetts oysters. During my first visit there in 2015, I met the state's Dept. of Marine Fisheries Vibrio coordinator, Chris Schillaci. This was a new position, which I viewed as a positive development, especially when I found out that he had a counterpart in the Dept. of Health, Eric Hickey. Beyond establishing a clear point of contact, Schillaci and Hickey operated as a team and brought greater ownership and accountability to promote best industry practices and improve illnesses tracebacks. The growing areas, practices and industry in Massachusetts were very different from those in Connecticut and New York. Oysters were being cultured in a variety of containers by hundreds of small-scale farmers, both subtidally and intertidally. Most *Vp* illnesses were associated with subtidal harvest, defying the conventional wisdom that intertidal harvest presented the greatest risk. As we visited shellfish farms and attended industry meetings, it was clear the growers were ready to guzzle the Cool-aid.

I listened to several growers complain to authorities about the inadequate cooling practices of neighbors in their growing areas, and even heard one story about a "meeting" back at the dock with an offending harvester. This was a compliance culture that I had never encountered! The 2016 Massachusetts Vibrio illness numbers were the lowest in five years, even though production has been steadily increasing. It was also their first year without a closure. Katama Bay is the most productive growing area on Martha's Vineyard, and is the sole

source of oysters served at many restaurants on the island. Reactionary closures in Katama Bay due to illnesses had occurred in 2013, 2014 and 2015, even though production was modest and cooling practices were among the best in the state. It's possible that hyper-reporting of *Vp* illnesses was a contributing factor.

Prior to the 2016 Vibrio season, some growers took the novel approach of moving their culture gear to a new license site outside of Katama Bay into the cooler waters of Nantucket Sound in a process the state labeled as "transplanting." Testing showed that water temperatures were 5-10°F cooler, with Vp levels about 10 times lower than in the bay. No illnesses were linked to the "transplanted" oysters, while two sole-source illnesses were attributed to those harvested from the warmer bay waters. Transplanting when Vibrio levels at harvest present an unacceptable risk could have widespread applicability if efficacy is demonstrated in future Vibrio seasons and in other areas.

- Continued on page 13



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Continued from page 12 Vibrio Illness Declines

Lessons Learned

Establishing a *Vibrio* coordinator position creates accountability for control authorities at all levels and is a precursor to developing a cohesive and comprehensive control plan that includes the full range of stakeholders.

Industry, starting with the grower/harvester, is the ultimate *Vibrio* risk manager, as their cooling practices drive risk. They also have the most to lose when customers become ill. During all the closures, the authorities never missed a paycheck. It is critical that control authorities empower industry with the best available science and tools to make informed risk-management decisions. This works best when subject matter experts communicate directly with business operators face-to-face.

Minutes really do matter when cooling shellfish to prevent exponential *Vibrio* growth. The Connecticut rapid-cooling experiment confirmed the FDA Vp Risk Calculator assumption that risk is directly proportional to exposure. In 2013 Connecticut operated under the National Shellfish Sanitation Program (NSSP) limit of five hours from harvest to first refrigeration, and an additional 10 hours to reach 50°F, where Vp growth ceases. Under this scenario, the Risk Calculator predicts four-to-five doublings, or a 2000-percent increase in levels and risk. Immediate cooling to 50°F maintains harvest levels and reduces exposure 95 percent, compared to the NSSP requirements described above.

In 2013 there were 21 *Vp* illnesses linked to Connecticut oysters before area closures were imposed in mid-July. Since adopting immediate cooling practices, Connecticut oysters have been linked to only four illnesses in those three years, and the oyster industry has made it through each *Vibrio* season with no costly closures. The accuracy of the Risk Calculator predictions relative to observed 95-percent reduction in illnesses is striking. Current reactionary closures are based on the number of illnesses associated with a growing area over specified periods. As production increases in a growing area, the likelihood of a reactionary closure increases proportionally. At the 2015 biennial ISSC meeting in Salt Lake City, DeRosia-Banick, Schillaci and Norm Bloom walked the audience through Norm's entire large-scale rapid-cooling operation, complete with aerial drone footage.

DeRosia-Banick and Schillaci exemplify the emerging business model for *Vibrio* control by working closely with industry to develop best management practices based on the best available science. They are also working with federal counterparts, NGO's and academia to collect data on the efficacy of practices and to characterize the impact of *Vp* populations and climate on risk. The data are already being incorporated into the next generation of risk tools, available at: products.coastalscience. noaa.gov/vibrioforecast

What happens in the Northeast region could shape the future of *Vibrio* controls for the global shellfish safety community.

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Disturbing Changes in Chesapeake Bay Climate Over the Last Century

By Dr. Lynton S. Land, Professor Emeritus, Department of Geological Sciences, Jackson School of Geosciences, University of Texas at Austin

The National Oceanic and Atmospheric Administration, The University of Maryland Center for Environmental Science. The Chesapeake Bay National Estuarine Research Reserves of Maryland and Virginia, and Chesapeake Environmental Communications have joined forces to examine 114 years worth of climate records for Chesapeake Bay. The results clearly show "evidence that physical climate changes are occurring and that species and habitats are responding to these changes." (See www. chesapeakedata.com/changingchesapeake)

Some of the changes seen since 1900 include:

1. The growing season is more than 30 days longer;

2. There are 30 fewer frost days per year;

3. There are 30 more nights when the temperature remains above 68°F; and

4. The area gets 4.5 more inches of rain.

Most of these climate changes are bad for the Bay. Increased rainfall will discharge more nitrogen and phosphorus, mostly from crop fertilization, worsening water quality. Eelgrass, already in severe decline, will be further stressed because of increased nutrient pollution, causing cloudier water and warmer temperatures. *Vibrio* bacteria will become more abundant, causing more infections from both skin abrasions and contaminated seafood.

In 2016, the first year in which atmospheric carbon dioxide at the Mauna Loa Observatory always



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exceeded 400 ppm, Arctic sea ice was at a new winter low. Almost all the world's credentialed scientists, the U.S. military and every major faith-based organization agree that Earth is warming and that the primary cause is fossil fuel combustion. Skeptics have no basis to contradict those three groups. Unless we seriously reduce carbon dioxide emissions, society will get what it deserves, whether everybody, especially our progeny, deserves it or not.

