EAST COAST SHELLFISH GROWERS ASSOCIATION



The East Coast Shellfish Growers Association represents over 1,300 shellfish farmers from Maine to Florida and the Gulf states. 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 What a Difference a Year Makes



What a long, strange year it's been. Think back to what you were doing a year ago. Markets had collapsed and we had no idea when (or if) things would return to normal. Anxiety was thick and everyone was trying to navigate relief programs like the Payroll Protection Plan and the CARES Act. Many growers put a hold on

Executive Director expansion plans and cut back on Bob Rheault seed purchases as they hunkered down to try and survive.

Many tried to pivot to online sales and local sales, as everyone posted videos trying to give home chefs the courage to learn how to shuck. The pain was oddly uneven, as clam sales were off, but nowhere near as bad as oyster sales, and growers in some regions were hit much harder than others.

Over the summer of 2020 we saw a slow return of demand as states experimented with reopening at various levels of occupancy while the pandemic waxed and waned. Many of our members had first-hand experiences with the virus. I redoubled my efforts to get access to relief programs and to educate our members about what help was available. Those efforts paid off when the USDA announced that shellfish farmers would qualify for the Coronavirus Food Assistance Program. Getting access to CFAP was the result of a huge lift by a large coalition of growers associations, and I am gratified to know that those CFAP2 checks saved a lot of farms from going under.

Flash forward to this spring. With vaccinations becoming widely available, we saw the unleashing of a tsunami of pent-up demand. After a year of being shut in, diners are eager to head out to their favorite eateries, but are finding it tough to get reservations. If you're fortunate enough to still have oysters to sell, you are probably breaking sales records right now. I know we lost a lot of great customers when many restaurants in big cities went under, but I see a renewed sense of optimism in our ranks. I like to think we will emerge from this challenge stronger and wiser.

I am looking forward to seeing old friends at conferences once again, but I am decidedly *not* looking forward to wearing a suit and tie in DC. I can't wait to refocus my efforts from disaster mitigation back to steering the regulations-development process at the ISSC and working to get bills passed and budgets boosted in Congress.

New Crop Disaster Assistance Program

by Robert Rheault, ECSGA Executive Director

On June 1 shellfish farmers became eligible for a truly effective catastrophic-disaster-assistance program: Emergency Livestock, Honey Bees and Farm Raised Fish Program (ELAP)¹. This free program is available through your county Farm Service Agency (FSA)²; shellfish farmers are eligible for payments of 70-90 percent of the value of their loss.

If you have registered for the FSA's Non-Insured Crop Disaster Assistance Program (NAP)³ you may be already signed up, but check with the FSA. Don't wait until disaster strikes! After enrolling you must file an acreage report before September 30 every year to remain eligible for ELAP assistance.

ELAP is geared to weather-related catastrophes such as hurricanes, blizzards, tornadoes, freezes and heatwaves (but not droughts). It is a great program, but it does have limitations on what types of losses are covered. For instance, larvae losses are not covered, nor are losses related to disease or harmful algal blooms.

Because this is the first time shellfish aquaculture producers have been eligible for ELAP, there may be a learning curve for the FSA in your county. For example, the FSA will need to establish countywide average prices and background mortality rates for all life stages of each type of shellfish. Typically, these rates are set by county committees, so it's important to have a shellfish grower from your county serving on the committee to help explain what we do. If your county has a lot of shellfish farms signed up for NAP, the FSA office may already know the ropes, but if not, they might need some guidance. Be patient.

The FSA has posted a YouTube video of a 43-minute webinar⁴ covering eligibility, annual acreage reporting, the general application process and required livestock-loss documentation. They also posted a slide set⁵ summarizing the recent changes to the program, and included written responses to ques-



BRANDON BOWERS

In February Winter Storm Uri killed 93 percent of cultured Texas redfish. Before the disaster redfish was not an eligible commodity for ELAP assistance, but thanks to the combined efforts of farmers, growers associations and legislators, the program was changed to cover food fish and shellfish.

tions from producers that were submitted during the webinar—the Q-and-A is well worth a read.

It is noteworthy that our access to this program was made possible through the considerable efforts of many key allies. The Catfish Farmers of America and the congressional delegations from Alabama, Arkansas and Mississippi have been working for years to broaden and improve ELAP. Changes to ELAP in the 2014 and

— Continued on page 2

Continued from page 1 Disaster Assistance

2018 Farm Bills and the Bipartisan Budget Act of 2018 accomplished several key objectives, including:

□ removing the requirement that farms be prior-enrolled in NAP;

□ lifting the \$20 million Commodity Credit Corporation funding limit to ELAP; and

removing the \$125,000 payment cap (per farm).

When Winter Storm Uri hit North America this past winter, fish farms in Arkansas, Illinois, Mississippi and Texas lost millions of fish. Eight Texas redfish farms suffered a 93 percent crop loss of approximately 5.3 million fish, with a total value estimated at \$37.8 million (not including the \$560,000 cost to dispose of the fish.) Additional, long-term negative economic effects were estimated at up to \$25 million for the remainder of 2021, and up to \$30.7 million for 2022. The cumulative value of the negative effects on just these Texas redfish farms is estimated at up to \$94.5 million.

In the wake of the freeze, the National Aquaculture Association (NAA) fired off a series of letters to USDA leadership requesting assistance under ELAP and reporting losses as they were quantified. The NAA worked closely with the Texas Aquaculture Association to elicit letters from Texas Governor Greg Abbott, and Rep. Michael Cloud (TX-27), who organized a Texas congressional delegation let-



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HAMAHAMAOYSTERS/INSTAGRAM

A heat dome that blasted the Pacific Northwest in June caused massive shellfish mortalities. ELAP now has the potential to assist growers who have qualified losses caused by heatwaves.

ter to the USDA and maintained constant communication with the agency and staff.

Realizing how little USDA and FSA knew about fish farming and fearing that the agency might question their loss estimates, the Texas farmers hired Carole Engle, of Engle-Stone Aquatic\$ LLC, to produce an impartial economic impact analysis.

Farmers in Alabama, Arkansas and Mississippi, along with the Catfish Farmers of America, also worked with the USDA and House and Senate members to highlight the Texas catastrophe, as well as the devastating fish losses in their states, and the dire need for an effective catastrophic disaster assistance program.

Their combined efforts resulted in a substantial change in Farm Service Agency policy sure to provide long-term benefits to U.S. aquaculture: including food fish and shellfish as eligible commodities under ELAP. The extreme heat that killed crops on Washington State shellfish farms in June is a catastrophic event that now qualifies for ELAP disaster assistance.

1. www.fsa.usda.gov/programsand-services/disaster-assistanceprogram/emergency-assist-forlivestock-honey-bees-fish/index

2. <u>www.fsa.usda.gov</u>

3. www.fsa.usda.gov/programsand-services/disaster-assistanceprogram/noninsured-crop-disaster-assistance

4. <u>www.youtube.com/</u> watch?v=MSB9OdexVho

5. www.fsa.usda.gov/Assets/ USDA-FSA-Public/usdafiles/ Outreach/Presentations/ELAP/ ELAP%20Webinar_Presentation%20Slides_with_Q_and As.pdf

ELAP Fun Facts

✓ Single individuals or firms with an Adjusted Gross Income over \$900K are not eligible, but there are ways to qualify for partnerships, so check with a lawyer.

✓ Shellfish must be reared in a controlled environment (owned or leased bottom) and grown in a manner that prevents predation.

✓ According to the FSA, for free-planted shellfish on private leases (not under nets, in containers or cages) "the only eligible cause of loss of mollusks or missing mollusk inventory is a National Oceanic and Atmospheric Administrationdetermined tropical storm, typhoon, or hurricane."

✓ Eligible shellfish farmers who are socially disadvantaged, limitedresource, beginning or veterans are eligible for payments of 90 percent of the value of their loss. Other farmers could expect to receive up to 70 percent of the value of their qualifying loss.

✓ Currently, farmers can receive a crop loss payment through both NAP and ELAP for the same qualifying loss.

✓ Farmers must have reliable, contemporaneous records to document seed plantings, sales and pre-disaster inventory. (It might be time to invest in some software; two great products advertise in our newsletter: <u>Smart Oysters</u> and <u>Blue Trace (formerly</u> Oyster Tracker.)

A Win for the Good Guys

by Robert Rheault, ECSGA Executive Director

Every now and then I come across a positive story about a local permitting battle that I just have to share. Recently I heard about a regulatory challenge in the South Carolina legislature that growers were able to defeat. This tale is worth recounting because it illustrates the value of state associations and the importance of forging alliances.

Frank Roberts of Lady's Island Oysters in Beaufort, S.C., got into a battle with his state senator. The two had sparred a few years ago when the senator tried to block some new leases, stating that, "We don't need any more small businesses in Charleston." So when Frank supported her opponent in last year's election, the spurned lawmaker decided to exact revenge by passing a bill revoking shellfish growers' rights to harvest oysters in summer.

Until five years ago South Carolina (like Georgia) had prohibited summer harvesting of oysters to avoid *Vibrio* illnesses. But then Frank and the South Carolina Growers Association (SCGA) managed to get a bill passed allowing the harvest of farmed oysters in summer, because as any grower will tell you, summer sales are a vital part of an oyster farm's survival.

In the years since the bill was passed South Carolina growers have proven that they can safely harvest oysters by rapid chilling. Restaurants loved the local product—a half-dozen oyster bars have sprung up in Charleston alone. With summer sales now comprising about 45 percent of Frank's annual revenue, he under-

standably went ballistic when he got wind of the proposed bill revoking summer harvest rights.

But rather than bring his Marine sniper training to bear, he galvanized the state growers association into action. SCGA President Julie Davis worked with Frank and the other seven farms in the state to develop an effective lobbying strategy, but with such a small industry, they realized they needed to enlist some allies. Thankfully, they had been working with the Farm Bureau for years, and in South Carolina (as in much of the country) the Farm Bureau wields a lot of clout.

They also brought in a group of 16 restaurateurs from Hilton Head, many of whom had built menus and raw bars around the concept of local, sustainable fresh oysters. In addition to providing employment for around 1,200 workers, they were able to point to \$72,000 in annual restaurant taxes tied to oyster sales.

The restaurateurs quickly raised about \$28,000 by charging diners a fee of \$1 per oyster, which was used by the SCGA to hire two lobbyists. Mobilizing chefs in white jackets and towering toques to roam the halls of the state house proved to be an extremely effective tactic.

The SCGA also enlisted the support of the Coastal Conservation Association (CCA), a well-connected group of recreational anglers who understood that shellfish-farming gear makes great habitat for summer flounder, and who were keen to see farms expand.

In the end, this powerful coalition of likeminded oyster-farming supporters managed to beat back anti-farming legislation that would have crippled the fledgling oyster-aquaculture industry in South Carolina.

After the bill failed to get traction, the leaders of the South Carolina House and Senate asked Julie Davis to work with their staffers to hammer out a few unrelated issues in the aquaculture regulations that needed fixing. Everyone agreed that the procedures for issuing public notices on proposed leases could use improvement, and that some other points of contention needed to be resolved. To their credit, the legislators chose to work with industry to make



OYSTER HOUSE

Since summer harvesting of oysters was first allowed in South Carolina five years ago, new restaurants have sprung up in Charleston and chefs have built menus around fresh, local oysters that are available year-round. The threat of shutting down summer harvests was met with resistance from growers and restaurateurs alike.

sure the changes were done right. At one recent meeting Julie pointed out that there was no reason for the anti-aquaculture folks in the South

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Walt Canzonier, Shellfish Industry Renaissance Man, Dies at 85

by Robert Rheault, ECSGA Executive Director

After a lifetime of selfless service dedicated to the shellfish industry, Walt Canzonier passed away on June 18, 2021 at the age of 85. I will miss his quirky humor and the immense wealth of practical knowledge that he loved to share in long-winded, elegantly crafted e-mails that often sent me to the dictionary. Walt's early work at the Rutgers Haskin Shellfish Research Laboratory focused on MSX and Dermo, but he really cut his teeth on the challenges of shellfish sanitation, especially viral and bacterial depuration.

Walt was a tireless and vocal advocate for industry, serving as the president of the New Jersey Aquaculture Association for a decade. He could explain complex science in ways that shellfish harvesters and farmers could understand. Walt relished standing up to the FDA

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at ISSC meetings, pontificating with unmatched flourish and battling regulatory injustices. He was one of the first researchers to demonstrate the utility of ozone for sterilization and loved to regale anyone who would listen about his foibles and failures, as well as the many tools he developed-but Walt never bragged or sought kudos.

In 2010 he received the National Shellfisheries Association <u>Wallace Award¹</u> for promoting "understanding, knowledge, and cooperation among industry

members, the academic community, and government." A fitting description of his life's work.

Walt was a talented plumber, carpenter, scientist, teacher and mentor to many of us. He loved shucking at events, always bringing to bear his big smile and quick wit; he was a pleasure to be around. I was crushed to learn that Walt suffered a stroke in 2011 that robbed him of his ability to speak. He had so much knowledge he wanted to share.

He will be sorely missed.



"'Tis the end of an era. I remember the many times that Walt, the self-titled 'fat, red-headed guy from the banks of the Maurice River,' would send me an envelope with pages of details on some topic or other asking me to "sanitize" his passionate writing. Walt considered himself a science generalist and lamented that so many people today are so highly specialized, and so often missing the larger picture. After wading through all the Walter-isms, there was always good advice. He was indeed a good mentor, and he mentored so many. In addition, he was fair-minded. He owned a home with two residences in it, and rather than getting what the market would bear for rent, he split the costs of the home, saying that it was fair that the tenant contributed, but not in excess of the cost. Lessons to take to heart.

Rest in peace, Walter." — Lori Howell

[Of his tenure as a member of the NJ Aquaculture Advisory Board, which spanned the terms of three state secretaries of agriculture]

"Walt had the ability to go back in history on practically any small nuance of shellfish and talk about it at length. This would typically elicit a rolling of the eyes and a deep breath from the secretary and others on the board or in the room. His institutional memory was such that...

the students who frequented the Haskin Lab called him 'Waltipedia.''' — Gef Flimlin

"Walt Canzonier was one of a kind. His breadth of knowledge and his ability to apply that knowledge, whether it was scientific, as a 'hands on' fix-it person, or as a historian made him a true Renaissance individual. More importantly he had a strong desire to help everyone who would expend some effort to learn. The shellfish industry in the U.S., and particularly in New Jersey, will be much diminished without his presence and help. I know I will miss him now that his presence is longer with us." John Kraeuter

1. <u>shellfish.memberclicks.net/</u> <u>assets/docs/Walter%20Canzo-</u> <u>nier%20Wallace%20Award%20</u> <u>qnl_spr2010%206.pdf</u>

Can Raw Foods Be Eaten Without Risk?

by Robert Rheault, ECSGA Executive Director

While the FDA and consumers would clearly like to have risk-free foods, researchers have concluded the obvious: unless you sterilize all foods, zero-risk is simply not a realistic goal. In a recent paper published in Current Opinion in *Food Science*¹ researchers in the Netherlands concluded that while modern food production, processing and regulation have made remarkable strides in reducing and minimizing the risks of foodborne illness, we will never be able to eliminate all risk, especially in raw foods.

The team notes that it is theoretically possible to process all foods with a sterilization step, but there are consequences that include altering the flavor, texture and nutritional qualities. The term "risk" denotes the probability of a hazard causing harm, and estimating risk involves quantifying the levels of hazards and calculating the probability of illness. Risk assessment is a science that attempts to model the dose-response relationship for each hazard. As our ability to detect and measure hazards improves we are able to detect incredibly small quantities of hazards, and at some point the chance of a tiny hazard causing an illness becomes "acceptable."

The researchers pointed out the limitations of testing: "...if we based decisions only on testing, we could (falsely) conclude that if a hazard has not been detected, the associated risk must be zero." It is impossible to sample all of your product because some has to remain to be eaten! The absence of a positive test does not prove that the hazard doesn't exist, it simply gives you a statistical likelihood based on the number of samples. It also does not ensure that hazards could not be introduced after the testing occurred.

Our food-safety system relies on control strategies to minimize risk; we can be proud that our system has elevated consumer confidence. The downside of this progress is that consumers have come to expect zero risk. The paper notes that, "It is important that every actor in the system understands that zero risk is unattainable in food." Even cooking a product at the requisite temperature for the appropriate time will often only reduce the number of pathogens



to "safe" levels, but rarely will it eliminate all pathogens.

It often seems that the FDA would like us to sterilize all of our products, but even the approved post-harvest treatments for shellfish (high pressure, gamma irradiation, pasteurization and extreme freezing) only reduce the levels of pathogens—they don't eliminate all of them.

- Continued on page 12

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Gear Innovations

Bio-Netting from Ketcham Supply: It's OK to **Throw It Away**

by Bob Ketcham, Ketcham Supply, New Bedford, Mass.

It's probably safe to say that every professional grower is finely attuned to the ecological impacts of the rapidly expanding aquaculture industry and proud of its sustainability. And it's no secret that industry folks are often subjected

to close examination under the eco-microscope.

One perennial eco bad boy for us has been the ubiquitous, single-use plastic market bag used to deliver product into the hands of dealers and consumers. Unfortunately, a system of reuse for these bags just isn't feasible, and they tend to be stubborn survivors of the landfill. To address this problem, Ketcham Supply is pleased to introduce biodegradable tubular netting to our aquaculture product lineup.

We think biodegradable netting is a great eco-conscious advancement, not only for commercial packaging, but also for wild oyster restoration efforts.

The techie stuff

For regulatory purposes, "biodegradability" is defined as the ability of a material to decompose within six months under the types

of conditions found in a landfill. Under the harmonized international testing guidelines for biodegradability, our netting material meets both the international ISO 20200 and European EN13432 standards. Certification is carried out by an independent agency according to strict testing protocols, and requires that the plastics break down under industrial-scale composting conditions, leaving no more than 10 percent of the original material in pieces no bigger than 2 mm.

In addition, the decomposition process cannot leave harmful residue that inhibits the soil's composting properties. The co-polyester material in this netting is so tasty to microbes that

> lighter extrusions can be certified under the even stricter "compostable" standard, which means it degrades within three months.

Though not quite on par with a banana peel composting-wise, these tests indicate that the copolyester will eventually completely biodegrade. That means the only byproduct of the process will be bacterial biomass and CO₂ (or methane, since anaerobic bacteria also degrade the polymer). Although biodegradation in a marine environment is not part of certification testing, the fact that polyester is readily broken down by both aerobic and anaerobic land-based bacteria means that it

will likely degrade in seawater as well. Even though testing standards for marine biodegradability do not currently exist, some studies¹ indicate that marine micro-organisms can in fact biodegrade this material.



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The netting is made from biodegradable copolyesters certified OK-COMPOST and does not contain PLA or other raw materials derived from corn or potato starch. It is available in 300-meter rolls in three colors: iris blue, mint green or burnt orange.

The real world

It stands to reason then that biodegradable netting would be a great candidate for oyster restoration projects. In these efforts, discarded oyster shells are seeded with spat and then submerged in depleted oyster beds, in hopes of restoring the wild population. Many times, plastic netting is used to contain the spat-on-shell so it can be placed in a manner that compliments the underwater topography to form artificial reefs. Currently the co-polymer is being used in academic, government and not-for-profit restoration projects. Besides being ecologically responsible in using netting that naturally disappears over time, consider how much more attractive the biodegradable feature will be in the grant application process.

To use the product as market bags-which we feel should be **boldly** displayed as biodegradable so consumers are aware of the invisible benefit—the product is simply cut to the desired packing length and the ends knotted, sealed with hog rings or zip ties, or perhaps

better yet, tied off with cotton, jute or sisal twine. As with our traditional tubular plastic mesh rolls, the environmentally friendly biodegradable netting opens to a 22" diameter.

In tests, biodegradable netting has been shown to have the same elasticity and strength as plastic netting. Ketcham Supply offers the netting in several colors: burnt orange for restoration projects, and green and blue for market bags. As always, we are committed to working with customers and suppliers to provide the best value we can to the aquaculture industry. We remain mindful of our shared resources and continue to be on the lookout for those little things that will help the industry to be viewed in a more favorable light.

1. Meyer-Cifuentes, I.E., et al. Synergistic biodegradation of aromatic-aliphatic co-polyester plastic by a marine microbial consortium. Nature Communications 11, 5790 (2020).

doi.org/10.1038/s41467-020-19583-2.



For additional information or to place an order, contact: John Supan Ph.D. Sea Farms Consulting LLC jsupan2575@gmail.com

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Continued from page 3 Summer Harvest in S.C.

Carolina Division of Natural Resources (DNR) to be involved with aquaculture at all, once they had made their case about potential interference with fisheries. She argued that farmed shellfish are not a natural resource of the state needing protection, and therefore it made sense to let health authorities deal with the *Vibrio* issues, while the DNR would do better to focus on trying to restore the declining wild populations.

While I am heartened by the win, two take-home messages present themselves: 1. Every state needs an effective growers association. If you are not already a member of your state association, now is the time to join. Don't let petty grievances or battles among members get in the way of creating a functional association. Sooner or later you are going to need their support.

2. If you want to achieve anything significant you must cultivate partners and alliances. Whether it's the Farm Bureau, the National Aquaculture Association, chefs, The Nature Conservancy, Pew Charitable Trusts, the CCA or whatever allies you can find, you would be well advised to forge alliances. We are stronger together and we need all the help we can get. As a corollary to this story, I would caution everyone to avoid throwing other groups under the bus to make your products look better. I have heard shellfish farmers denigrate wild-harvest fishermen or salmon farmers, and this is not a good strategy.

Go ahead and tout the positive aspects of shellfish farming all day long, but you never know when you might need the help of a fisherman's organization or a fishfarming association to get your much-needed legislation passed or to gain access to that coveted USDA relief package. There's a lot of truth in the old adage that people who live in glass houses should not throw stones.

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Proposition 65 Could Cost You Big Bucks

by Robert Rheault, ECSGA Executive Director

If you sell products to California, you should be aware of <u>Proposition 65¹</u>, a law requiring the labeling of products listed by the state as causing cancer, birth defects or other reproductive harm. A few fishery products have tripped California's strict limits on cadmium and lead, resulting in eye-popping fines and settlements.

Proposition 65 was a ballot initiative voted into law in 1986. The California Office of Environmental Health Hazard Assessment (OEHHA)² now mandates that if a product (or the packaging it is shipped in) might contain certain chemicals, the package must have a label describing what the chemical risk is and how it might impact consumers' health.

Every year the list of chemicals³ grows—it now includes over 900 potential toxins and carcinogens. Because it is California, the state decided that the federal limits on many of the substances are too lenient, and established much more

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MEGAN K. TERRELL megan@plauchecarr.com stringent limits for products sold in California.

Take cadmium for example, a heavy metal found in soils and waters all over the world. In some places cadmium levels

are naturally high, and certain shellfish can accumulate enough that some regulators started to have concerns. According to Prop 65, a seller might be able to win a lawsuit by showing that the presence of the metal is the result of naturally occurring contamination as opposed to a human (anthropogenic) pollution or food additive, but it could be a heavy lift. New Zealand is trying this argument after being cited for cadmium in their green-lipped mussels, but it is likely to cost them more to prove their case than they would end up paying in a settlement.

In 2019 companies paid \$30 million to resolve 2,410 claims (909 settlements) with the average settlement coming in at around \$35,000. For the seafood industry most of the claims have been for lead and chromium found in cooked



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squid and shellfish products from Asia or New Zealand, but I did hear of one West Coast firm that was nailed with a \$50,000 settlement for cad-

mium in smoked shellfish. One of the scarier elements of the law is that private attorneys can initiate legal action and take 25 percent of the settlement, so it is a proven money maker for certain types of ambulance-chasing lawyers.

The literature on most of the substances is dizzyingly complex. You can find Environmental Protection Agency (EPA) regulatory limits⁴ for some contaminants in some foods, but shellfish are regulated by the Food and Drug Administration (FDA). It's often the case that different regulatory limits are cited by the FDA, the EPA and the WHO-FAO Codex Alimentarius⁵. Then for shellfish we have Alert levels, which have no public health significance, but are just one standard deviation above the mean and tell regulators they need to be aware there may be

contamination in a particular harvest area if the levels are tripped. We have Alert levels of iron, copper and zinc, (all of which are in my daily multi-vitamin) as well as mercury, arsenic, chromium and cadmium. Then there are Action levels that have been established by the EPA for drinking water.

To comply with the Codex limit on cadmium, shellfish meats must contain less than 2 ppm (or a tolerable monthly intake below 25 µg/kg of body weight.) The FDA says the limit for cadmium in shellfish is 4 ppm.

California presents their Prop 65 limits as daily consumption limits, which for cadmium should be below 4.1µg/day. Depending on how much you think people might eat you are probably ok, but how much can you afford to spend on testing? Thankfully, an East Coast Shellfish Research Institute study conducted by Dale Leavitt in 2009 found that the levels of lead, cadmium and mercury in clams and oysters from up and down the East Coast were well below the levels that should cause concern, unless they were harvested near a superfund site, metals-plating facility or Navy base.

Then there are the labeling requirements. It's bad enough to have to put a label on your products saying it could cause cancer or birth defects, but I have not been able to get a clear answer on what is required. Firms will sell you generic labels, but some elements of the regulation seem to indicate that you have to explain which substances are potentially

- Continued on page 13

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Pity the Plight of the Resource Manager

by Robert Rheault, ECSGA Executive Director

The job of the state resource manager is nearly impossible. They are expected to equitably balance the use of all the marine resources under their purview, allocating space for and permitting activities as diverse as wastewater disposal, marina operations, commercial and recreational fishing and navigation, and aquaculture. In addition, resource managers are required to follow the many federal laws that protect threatened and endangered species and protected resources, such as critical habitat and submerged aquatic vegetation. They are called to protect and preserve the natural resources of the state while also encouraging the exploitation of those resources to the maximum extent possible. Most state constitutions mandate that the marine resources of the state be managed in a way that maximizes the benefit to the sovereign, meaning the population of the entire state.

Virtually every decision the manager makes involves allocating marine resources fairly among the various stakeholders. For instance, resource managers must decide whether fish and shellfish are best harvested by recreational or commercial harvesters, draggers, or

 We need to elected of policies an through th people who threatened them to elected of address it."
 "We need to elected of policies and through the people who threatened them to elected of address it."

The Shellfish Growers Climate Coalition unites 200+ shellfish businesses from across the country and supply chain. Add your name to our growing roster of members today!

"We need to do whatever we can to convince elected officials that well-conceived public policies are needed—now. My hope is that through the coalition, we can explain to people who love our shellfish that we are threatened by climate change and convince them to elect representatives that not only understand the urgency, but will work to

> Bill Mook Mook Sea Farm Founding SGCC Member



nature.org/shellfish4climate IG: @shellfish4climate Email: sgcc@tnc.org



rod-and-reel fishermen. They decide where marinas and mooring fields are best located, how much sewage effluent is acceptable in state waters, and of course, where aquaculture leases are placed. Anyone who is forced to make allocation decisions like these is almost certainly going to piss off the people who thought they deserved a bigger share of the pie. Often managers are forced to take rights and privileges away from a group that has enjoyed historical use rights in order to permit new uses and activities that didn't previously exist (such as wind farms and aquaculture).

Resource managers are expected to be neutral arbiters in what are often contentious issues. They must struggle to ignore their own opinions and follow the priorities established by the state's legislators and executive branch. Pretending you don't have a personal opinion is hard enough, but trying to follow the will of a fickle legislature can be nightmarish.

Invariably, managers' decisions will be challenged by those who feel unjustly wronged. The aggrieved may be unpleasant at public meetings, and more often than not someone will try to go around the decision-makers to seek a more agreeable outcome by going up the food chain (or worse yet, try to get the decision-makers fired or reassigned). Many malcontents will throw the managers under the bus on social media or in the opinion pages of the local paper. Often, well-connected opponents will turn to the legislature to craft laws that restrict actions they want to prevent. Those with deep pockets might threaten or initiate lawsuits, sometimes against the state, but sometimes against the resource managers themselves. Who would sign up for this job?

Quite often resource managers are expected to make these decisions with limited information, or more commonly with multiple sources of conflicting information. Public hearings typically feature presentations by competing teams of highly qualified scientists bringing reams of data and science to the table, each supporting opposite views of complicated issues. One group may claim a site is a treasured fishing hotspot, while another says no one ever fishes there. Managers are expected to make value judgments that are rarely straightforward. Should they allocate fishery quota to the



YOUNG FRANKENSTEIN/IMBD.COM

It's a safe bet that proposing to site a shellfish farm in front of a waterfront home will bring out the mob wielding pitchforks, torches, highly paid lawyers and expert witnesses.

group that historically landed those fish who then sell those fish to the people of the state to eat, or should they allocate more quota to recreational fishermen who can claim a much higher economic impact?

For decades I have tried to make the argument that while eelgrass may be a wonderful habitat for many species of juvenile crittersand may be very effective in stabilizing the sediments, removing nutrients and providing forageshellfish aquaculture provides similar ecosystem services, and in many cases can do an equally good or even better job. How is the resource manager supposed to weigh these statements that are equally true when each side is backed up by hundreds of peerreviewed scientific papers?

I suspect that resource managers are trained in how to weigh competing claims and come up with equitable solutions to complex issues, but they also need to grow a thick skin. When decisions don't go their way, aggrieved users will often resort to ad hominem attacks, impugning the morals and motivations of the decision makers. I recall many hearings where opponents of various projects, having run out of arguments to offer, turned to attacking the qualifications or scruples of the decision makers (as well as the applicant).

While I often like to describe shellfish farming as a win-win-win (sustainable seafood, jobs and economic development, with ecosystem benefits to boot), it is almost unavoidable that placing a lease anywhere will negatively impact someone. Water skiers might need to find another spot, sailors might have to chart a different course, waterfront homeowners might have to deal with changes to their viewscape.

- Continued on page 12

Researchers Closing in on Solution to Clam QPX

by Robert Rheault, ECSGA Executive Director

A <u>collaborative team</u>¹ led by Bassem Allam at Stony Brook University's Marine Animal Disease Lab and funded by NOAA has been working on examining variations in the hardclam genome in populations along the East Coast. Their goal is to identify which genes regulate various traits, in hopes of selecting lines of clams with desired traits, such as rapid growth, harder shells, and resistance to disease and environmental stressors.

Since the 1990s clam growers on Cape Cod have suffered devastating mortalities related to a parasite historically known as QPX, Quahog Parasite Unknown, but recently named as <u>Mucochytrium quahogii</u>. Since the parasite is ubiquitous along the East Coast, and mortalities outside of Cape Cod are rare, pathologists have long suspected that mortalities were probably caused by stress or genetics.

In 2002 researchers were able to show a genetic link to QPX resistance by planting clams from different stocks into a location with high mortalities. When some lines survived better than others it became clear there was a genetic basis for resistance. By using genetic sequencing tools researchers have been working to identify which genes are linked to survival, so that hatcheries can select animals with those genes to create lines of resistant clams.

Genetic sequencing allows researchers to look for single nucleotide polymorphisms (SNPs)—mutations in the genetic code where the replacement of a single nucleotide leads to changes in traits. The team planted clams from two populations (one susceptible and one largely resistant) in an area known for QPX mortalities. By looking at the frequencies of different SNPs in the populations before and after a mortality event, they were able to identify which genes might be associated with resistance. They found that about 200 SNPs changed in frequency among the survivors, pointing to potential resistance markers. Researchers at the Virginia Institute of Marine Science (Ann Ropp and collaborators) examined the genetic diversity in 450 clams collected from Canada to South Carolina, looking for differences in the DNA. They discovered over a 100,000 SNPs and identified six genetically distinct populations.

The research effort at Stony Brook aims to describe the genetic diversity of the species along the East Coast and develop affordable genotyping methods to identify genetic markers associated with relevant traits for selective breeding. Although their initial focus is to identify clam stocks for QPX-disease resistance and heat tolerance, future research could target other traits. These studies have identified a large set of markers that can be used as a solid basis for using marker-assisted selection of hard clams for economically important traits. Stay tuned!

1. <u>storymaps.arcgis.com/stories/3425623358</u> <u>164278bbe1ed7f7311a605</u>



Continued from page 10 Pity the Resource Manager

Precious few individuals in our society would willingly sacrifice anything they believe is theirs for the benefit of the "greater good."

How is the typical underpaid and overworked state resource manager supposed to navigate this minefield? I suppose the primary concern is pleasing the bosses and keeping your job. That means meeting all the various (often conflicting and vague) legal mandates of dozens of federal and state regulations. From there it seems that the best approach is to try striking an equitable balance among the many vested



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resource users, while striving to meet the con-

stitutional mandate to maximize the benefit to

the sovereign. Perhaps the hardest part of the

job is tuning out the threats of the loudmouths

and blowhards, and the protests of the rich and

When it comes to shellfish farming I find it

pretty easy to win over concerned individuals

when I talk about it in the abstract, especially

one on one. Few people can credibly object to

a waterbody to the sustainable production of

able and selfish if their only complaint is that

ty much take it to the bank that when a farm

is proposed in front of someone's waterfront

home, mobs with pitchforks, torches, highly

paid lawyers and expert witnesses will come

out swinging. Allegations of environmental

Unfortunately, all too often rational thought

modate politics and the concerns of the rich

and powerful. Even if the applicant can show

that the proposed farm poses a minor incon-

and scientific evidence are set aside to accom-

hazards will be put forward.

harm will be leveled and claims of navigational

they don't want to look at us. Yet you can pret-

a policy that calls for allocating 5-10 percent of

seafood. In fact, objectors look pretty unreason-

powerful.

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venience to a small number of people, if those people are well-connected they will often carry the day. I take some solace in the knowledge that lawsuits leveled against resource managers typically fail. If permitting agencies follow the state's guiding documents and regulations, and consider the various lines of evidence presented, the agencies can usually defend themselves on questions of how they manage public resources.

On the other hand, I can point to too many cases where the rich and powerful have defeated the reasonable and rational. Applicants are often put in the impossible position of proving a negative, asked to show that their proposed lease is not the best fishing spot in the state, or their farm will not disturb the environment. Resource managers often say they have struck the proper balance when all sides are equally pissed off, but all too often it seems they ignore enabling language in state law noting that aquaculture is in the public interest, and instead bow to the pressure from the rich and powerful.

I wish I had some uplifting message or advice for new growers wading into these perilous waters. I often say that farming shellfish takes an extraordinary combination of pigheadedness and patience, and if you can't tolerate the application process then you probably won't last long as a farmer. The trial-by-fire that applicants must endure will certainly temper your steel, but may also take a toll on your sanity.

Continued from page 5 Eliminating Risk

High-pressure processing will kill most bacteria, but to eliminate norovirus would require such intense pressure that the shellfish would be rendered unpalatable.

I think we can be proud of the improvements we have made in reducing the risk per serving associated with the consumption of raw shellfish. We have a complex, multi-faceted regulatory process that makes consumers confident enough to continue to purchase our products. We may rail against restrictive regulations and aggressive enforcement, but this is the price we pay for robust consumer demand. The risk of illness for most foods is close to zero, but defining the level of "acceptable risk" for regulators and consumers will always remain a challenge.

1. Zwietering et al., *All food* processes have a residual risk, some are small, some very small and some are extremely small: zero risk does not exist. Current Opinion in Food Science, June 2021. <u>doi.org/10.1016/j.</u> <u>cofs.2020.12.017</u>

Continued from page 8 Proposition 65

in your foods and what specific health risks they might pose.

So if you want to sell to California (or if your wholesaler is shipping to California) you may need to decide how much to spend on testing, whether you want to label your food "this could kill or maim you" or how much you can afford to spend on lawyers and how much time you can spend deciphering the rules.

1. <u>oehha.ca.gov/proposition-65</u>

2. <u>www.p65warnings.ca.gov/</u> <u>what-proposition-65</u>

3. <u>oehha.ca.gov/proposition-65/</u> proposition-65-list

4. www.ecfr.gov/cgi-bin/text-idx? SID=652f6661f1c740545053c40 0dfe56616&node=pt40.24.180&r gn=div5#se40.26.180_1364

5. www.fao.org/fao-who-codexalimentarius/sh-proxy/tr/?lnk=1&url =https%253A%252F%252Fworks pace.fao.org%252Fsites%252Fco dex%252FStandards%252FCXS% 2B193-1995%252FCXS_193e.pdf



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The Nature Conservancy, Partners Release Global Study **Quantifying Habitat Benefits of Shellfish Aquaculture**

The Nature Conservancy

The Nature Conservancy and partners at University of New England, University of Melbourne and University of Adelaide systematically reviewed 65 published sources from around the world to assess the biodiversity benefits of mussel, oyster, clam and seaweed farms.

Across all species groups, a greater number of fish and invertebrates were observed on the farm sites compared to nearby locations. Mussel farms appear to be the most beneficial of these species groups for enhancing the volume of marine life, as about 3.6 times more fish and invertebrates appear around mussel farms compared to nearby locations.

In addition, a greater diversity of species was also observed on some farm sites. Oyster farms proved to be the most effective for increasing species diversity: 30 percent more species tended to inhabit these farms than areas near

the farm. These benefits were the result of providing a structured habitat, food and places to forage, and reproductive grounds for fish.

"Aquaculture is among the world's fastestgrowing forms of food production and there is a growing biodiversity crisis that already exists in our ocean. It's critical that we identify ways to develop aquaculture that benefits, rather than harms our ocean, that are based on sound science," said Robert Jones, Global Lead for Aquaculture at The Nature Conservancy and co-author on the study. "This study is game changing in that it clearly shows an opportunity through shellfish and seaweed aquaculture. For the first time, we're able to put quantifiable global numbers on the benefits these farms can have on marine wildlife."

The authors hope that policymakers at local, regional and global levels will recognize the potential positive outcomes provided by aquaculture and begin to incorporate them into regulatory systems that encourage the develop-



ment of a habitat-positive industry, potentially creating public incentives and market-based approaches that will allow farmers to be rewarded or compensated for the benefits they are providing.

"When managed and practiced well, commercial, market-driven shellfish and seaweed farming can provide ecosystem services," said Dr. Seth Theuerkauf, the study's lead author and former Global Aquaculture Scientist at The Nature Conservancy. "This means that we have another tool in the coastal ecosystem recovery toolbelt that can be deployed by the private sector to produce food while providing the ecosystem services that we so desperately need in many systems."

More broadly, the authors hope that the example of shellfish and seaweed farming systems can provide an important case study that inspires application and development of aquaculture and agriculture that is nature-positive, while also helping to provide food security.

"For decades we have thought these benefits may be real. It is fantastic to see these results quantify this positive habitat value from aquaculture," said Dr. Barry Costa-Pierce, Henry L. & Grace Doherty Professor of Ocean Food Systems at University of New England.

To read the full study, *Habitat value of bivalve* shellfish and seaweed aquaculture for fish and invertebrates: Pathways, synthesis and next steps, visit doi.org/10.1111/raq.12584.

- See graphic on page 15

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How Much Habitat Benefit Do Shellfish and Seaweed Farms Provide?



From Theuerkauf et al. Habitat value of bivalve shellfish and seaweed aquaculture for fish and invertebrates: Pathways, synthesis and next steps.

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Grower	\$100,000 to 300,000	\$500
Grower	\$300,000 to 1 million	\$1,000
Grower	\$1 million to \$3 million	\$2,000
Grower	over \$3 million	\$3,000
Shellfish Dealers and Equipment Suppliers		\$250
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