

# National Shellfisheries Association Quarterly Newsletter



Est. 1908

2016 (3)

## President's Message



Greetings from Dayton, Ohio, the newest location for oyster shell recycling. Wait, what?? Yes, we have an oyster shell pile in Dayton, Ohio. In our backyard (see photo). My husband, Doug, is also a shellfish biologist (mussel adhesive proteins) and we decided four years ago

to bring some of the coast and our shellfish passion to our friends in Dayton. We just celebrated our fourth annual Oyster Roast and hosted over 100 people on a beautiful sunny Midwestern afternoon. Tom, our local wholesale supplier, has been instrumental in providing the volume and quality product that we require. Kudos to all the shellfish growers and suppliers out there, one year we may have your product on our backyard roaster in Dayton. By the way, we've made some culinary converts in the Dayton area – some of our guests had never eaten an oyster or clam or shrimp or mussel before attending our Roast. I predict that the Dayton market will experience a bump in shellfish demand in the near future.

Speaking of shellfish demand, we've been mostly fortunate this year on the U.S. east coast with few storms to disrupt our science and our businesses. One community that has been challenged is Cedar Key, Florida. The storm that swept through in early September 2016 severely damaged shellfish operations and homes in the area. As the locals have very clearly stated, 'we are still here and we will re-build' (see story and recovery plan on page 10). Cedar Key is a prime example of the resilience and optimism of those who live and work in the coastal zone. Some may say we're crazy, but we wouldn't (couldn't!) live and work any other way.

Your Association is planning for our next annual meeting on March 26-30, 2017 in Knoxville, Tennessee. Now you may think that I had a heavy hand in selecting Knoxville since I lived there for 7 years – but you would be incorrect! In looking at future sites for the NSA annual meetings, we consider proximity, ease of access, meeting and housing costs, and local activities. Our evaluation of east coast potential sites led us to look at sites that were not necessarily coastal. Knoxville is a prime location: reasonable meeting costs, proximity for many NSA members, easy access for members via car or plane, and a diverse selection of local activities for members and their families. The Knoxville Marriott crew is very much looking forward to hosting 300+ shellfisheries people and I'm sure our meeting will be written up in the Knoxville News-Sentinel. OK, so maybe being a former resident does help – I still have

some local contacts. Be sure to read the latest meeting information on pages 6 and 7 in this issue of the *QNL*. Here's a meeting teaser: Scallop Gallop...stay tuned.

The NSA Strategic Plan Committee will be soliciting member input during the next few months in the form of a questionnaire. As I mentioned in the last few Newsletters, we are revising and updating our 2009 Strategic Plan to guide the direction of the Association for the next 5 years. Those of you who have developed a strategic plan for your business, laboratory, or institution know that any strategic plan is a living document – as things are accomplished or circumstances change it becomes necessary to revise and update. But our driving principle is inviolate: maintain a vibrant and fiscally viable Association that reflects the needs and interests of our membership. Your input is essential and we will ask for a bit of your valuable time to complete the questionnaire.

Thank you for being a member of the National Shellfisheries Association. We know that you are selective in where you spend your membership dollars and we appreciate that you've chosen to support the Association as a member. Our goal is to provide our members with a comprehensive high-quality product: the award-winning *Journal of Shellfish Research*, a timely and relevant annual meeting, opportunities for professional development for student members, and a cadre of fellow members that really understand what we all do – *we do shellfish*.

**Karolyn Hansen**  
NSA President



### *In this issue:*

- ***Knoxville update***
- ***2015 Castagna and Abbe Student Research Grant Updates***
- ***In Memoriam: Robert R.L. Guillard***

## Two Sides of One Mask

*A painted wooden clam mask celebrates the home and history of the Heiltsuk First Nation.*

by Wudan Yan

They are humble yet mighty, and often overlooked. Yet, just one taste of a freshly dug clam had the power to transform a person's perspective during a bleak, lean winter along North America's Pacific Coast. Clams were a reminder that—as indigenous people have known for generations—when the tide is out the table is set.



Measuring slightly longer than the average human face, this mask, like the shellfish that inspired it, is transformative. Literally. At rest, it is a clam, but when the two halves are slightly ajar, a human face emerges.

The mask—beautifully constructed in wood, leather, and cotton string—was collected by US Navy Lieutenant George T. Emmons, who was stationed in Alaska in the late 1800s. It's unclear exactly where or how he obtained the mask, but collection notes say it came from Bella Bella, a village of the Heiltsuk First Nation about 480 kilometers northwest of Vancouver. There were a number of artists in Bella Bella at the turn of the century, but the mask's style suggests it may be the creation of Captain Richard Carpenter, a Heiltsuk man from the village of 'Qvuqvai, who applied a distinctive design style and painting technique to his carvings.

Today, Bella Bella is the Heiltsuk First Nation's primary village and the home of some of Carpenter's descendants. The community's long reliance on the ocean for sustenance makes it no surprise that the carver was inspired by the creatures around him. According to Harvey Humchitt, a hereditary Heiltsuk chief, clams have been a staple food for as long as the Heiltsuk have lived on these shores. For many centuries, the Heiltsuk have tended clam beds to enhance habitat and give families easy access to a consistent food supply.



"Since clams are so important to us, they also play a role in some of our cultural activities and events," Humchitt says. The clam mask tells a story of clams that transform into people, a legend that is also relayed through a traditional dance. It's a story that blurs the line between the human and animal world, a reminder that the two are really one, and all beings, even the little ones, have a big presence at the table.

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## IN MEMORIAM



Robert R.L. Guillard

1921 – 2016

Honored Life Member (1995)

Robert (Bob) Guillard has left a lasting and extraordinary legacy, not the least of which is his invention of *f/2* over a half century ago – the algal culture medium that made aquaculture possible. Ever generous with his time and expertise, he had an infectious curiosity. An outstanding scientist, colleague, mentor, teacher, and friend, he will be missed by many. A full biography and bibliography will appear in the *Journal of Shellfish Research*.

## RECRUIT A NEW MEMBER!

The National Shellfisheries Association is a member-driven organization. This summer 2016 we had just over 400 paid members, which is considerably fewer than we had a decade ago. Membership is what runs this organization for YOUR benefit! Membership in NSA has fantastic benefits and is a great "buy." Your membership in NSA includes this informative Quarterly Newsletter, a print subscription to the *Journal of Shellfish Research*, reduced conference registration, and eligibility for student awards. In addition, membership allows free online access to past *JSR* articles and abstracts through BioOne. Not to mention the camaraderie of a network of kindred colleagues around the world.

Please help us maintain and grow our association; recruit and remind your students and colleagues to become members of NSA and to continue their memberships. Walk down the hall and bug them right now! Advertise NSA and membership benefits at other conferences you may attend. If you are one of the 150 people who have let your own membership lapse, sign up on the website right now – it's easy! <http://www.shellfish.org/membership>.

The NSA Membership Committee (Shirley Baker, Tessa Getchis, and Recruits representative, Hillary Lane Glandon) is busy devising incentives for recruiting new members, re-signing lapsed members, and retaining our current members. "Stay tuned" for special membership incentives! (To request printed NSA materials or if you find you cannot access your NSA account, contact an officer).

**Shirley Baker**  
Membership Committee



# Recruits' Corner

## Hello, Recruits!



Registration for the 109<sup>th</sup> annual meeting is now open! The meeting is from March 26<sup>th</sup>-30<sup>th</sup> in Knoxville, Tennessee. Take a moment to visit the NSA website ([www.shellfish.org](http://www.shellfish.org)) and see some of the early highlights of this meeting, including the special sessions that are being planned. As you all know, student volunteers are a big part of the meeting's success and we will be counting on your help to make this meeting happen. **ABSTRACTS** for the annual meeting are due on **DECEMBER 1<sup>ST</sup>** – so don't delay in making your meeting plans!

Knoxville will be a fantastic host city, and we have planned some amazing activities. As always, the student breakfast and orientation is scheduled to get all the Recruits up to speed on how to get the most out of the meeting. Social activities include a scavenger hunt and our student mixer, designed for the Recruits to experience all that local Knoxville has to offer. Finally, we are looking for interested runners and joggers to join the recruits in a planned a fun run – The Scallop Gallop. This will be a great opportunity to stay active and see some of the town. The exact dates of these activities will be shared with the Program, so keep an eye out and plan your schedules accordingly. If you have any ideas for activities, or saw something at a previous meeting and would like us to bring it back, don't hesitate to contact me. The student panel is still in the planning stages, so if you have any ideas or suggestions on a specific panel topic or panel member, please feel free to share them!

We hope the NSA Recruits continue to make their presence felt and participate fully in this coming meeting. Keep an eye out for the call for student volunteers. Each year we need help to run the registration table and sales booth, as well as the A/V during the sessions. Recruits are crucial in making sure these activities run smoothly and in ensuring a successful meeting. It would not happen without your participation and it gives you a great opportunity to interact with other participants!

Again, Abstracts are due **December 1<sup>st</sup>**. Also, don't forget to apply for SEF travel awards! This is a competitive award, and the deadline for application is the same as the abstract due date for the meeting. The application process is simple, only requires a cover letter, a 1-page form which can be downloaded from the website, a copy of the submitted abstract, and a letter of reference from your advisor. Remember, you can apply for an SEF Travel Award every year, even if you have previously won.

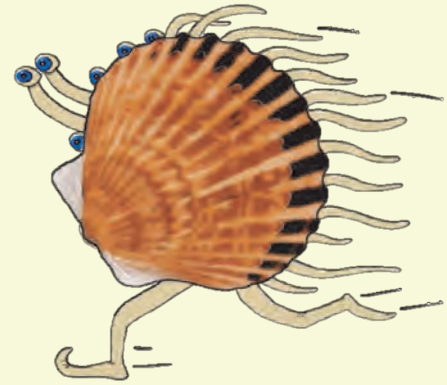
I hope to hear from you soon! As always, email me ([hlane@umces.edu](mailto:hlane@umces.edu)) with any ideas or concerns. If you haven't already, be sure to "Like" the National Shellfisheries Association on Facebook –updates will be posted regarding the meeting on the page as March draws closer. If you are interested in getting involved for future meetings, please email me for more information.

Have a great rest of the semester and I look forward to seeing everyone in March!

*Hillary*

## The Scallop Gallop

NSA 5K in Knoxville  
Check the webpage for updates



Contact Lewis Deaton:  
[lewis.deaton@lusfiber.net](mailto:lewis.deaton@lusfiber.net)

## REMINDER Important Deadlines

**November 1:** Nominations for:

- Honored Life Member Award
- David H. Wallace Award
- Neil Bourne - Ken Chew Award

**Student Research Grant Awards:**

- Melbourne R. Carriker Award
- Michael Castagna Award
- George R. Abbe Award

**December 1:** SEF Travel Awards

# 2015 George R. Abbe Student Research Grant Update

Awardee: Hillary Lane Glandon  
University of Maryland

*"The effect of climate change on the physiology and ecology of juvenile blue crab, Callinectes sapidus"*

Future climate scenarios predict increases in carbon dioxide (CO<sub>2</sub>) over the next century mostly through the burning of fossil fuels. To date approximately 30% of the released anthropogenic CO<sub>2</sub> has been absorbed by the ocean. A consequence of the release and subsequent oceanic absorption of CO<sub>2</sub> has been an increase in oceanic water temperatures (global warming) and a decrease in oceanic pH (ocean acidification). The objective of my PhD dissertation is to quantify the impact of warming and acidification on the physiology and ecology of juvenile blue crab, *Callinectes sapidus*, in the Chesapeake Bay. Blue crabs are ecologically and economically important in the mid-Atlantic region, making them an ideal indicator species to examine the impact of climate change on estuarine species. The change in water temperature and chemistry that will occur as a result of the acidification of the Bay may have impacts on marine calcifiers, such as the blue crab, that create their carapaces utilizing ions and minerals present in the water. One such impact could be changes in the properties of the carapace since the formation of the crustacean shell is intricately related to both water temperature and chemistry.

During the summer of 2016, I conducted a laboratory experiment to test the physiological impacts of warming and acidification on juvenile blue crab in the Chesapeake Bay. Two levels of both temperature and pH were tested: ambient, which reflected current summer conditions in the Chesapeake Bay, and high, which reflected predicted summer conditions in the year 2100 in the Chesapeake Bay. The temperature and pH of the water were manipulated in a flowing seawater laboratory at the Chesapeake Biological Laboratory in Solomons, Maryland. The



tank system consisted of two temperature-controlled tanks, eight pH-controlled tanks, and 80 individual crab tanks. The system was fed with filtered Patuxent River water, the same water from which the crabs for my experiment were collected. My experimental system exposed crabs to one of four temperature/pH treatments – ambient/

ambient, ambient/low, high/ambient, and high/low – allowing me to test the effects of temperature and pH as well as any possible interaction between the two factors. Crabs were kept in the system for a period of two molts, or about 30 days, and once they had fully hardened after the second molt they were removed from the experiment and preserved for the carapace analyses.

I quantified two aspects of the juvenile blue crab carapace in order to test the impact of acidification and warming on the shells of juvenile blue crabs. First, I determined the thickness of the shell using microscopic techniques. In order to do this, I

removed the dorsal shell from the crab, dried it until it was a constant weight, and then embedded a small piece of dried carapace in an epoxy/resin block. This allowed me to cut the shell into thin sections and determine the thickness of the whole shell as well as the individual layers. Second, I used Inductively Coupled Plasma-Optical Emissions Spectrometry (ICP-OES) to determine the concentrations of both calcium and magnesium in the dried shell in order to quantify any impact of climate change on the chemistry of the shell. The crustacean shell gains its strength from calcium, so any changes in the calcium concentration could mean changes in the protective nature of the shell. Since magnesium is so abundant in seawater, crabs must actively exclude magnesium during the shell formation process. Therefore, an increase in magnesium concentration as a result of environmental changes could mean this selective process is breaking down, and the animal is possibly in a more stressful and vulnerable state.

From my experiment and data analyses, I determined that changes in water chemistry associated with predicted future changes in temperature do impact the structure and chemistry of juvenile blue crab shells. Increased water temperature caused the crab shells to be thinner, contain less calcium, and more magnesium. Exposure to future predicted levels of acidity caused crab shells to be thinner and contain more magnesium, but increased acidity actually caused an increase in the amount of calcium found in the crab shells. The impact of increased temperature may be related to the increased growth rate that I also observed as a result of increased temperature during my 2016 experiment. Crabs growing faster due to warmer water may not have time to create a thick, heavily calcified shell since the time between molt events is relatively short; however, the acidification story is a bit more complicated. While acidity may be a stressor for the crabs, there are many physiological processes that are likely impacted by the changes in water chemistry concurrent with ocean acidification. This acidification stress may have caused the thinner shells and increased magnesium content that I observed in crabs in acidic water, but the explanation for the increase in calcium content is less clear. This is not unusual in the acidification literature; the impacts of increased acidity are often complex, and may impact the animal secondarily in comparison to temperature effects. I am currently in the preliminary stages of analysis for these data and I hope that a clearer picture will emerge soon!



*The Summer 2015 CBL Blue Crab Team: me (center) with two college students that I mentored, REU student Annie Nyffeler (left) and college intern Maddie Schwaab (right). These crabs were not from our experiment, since it would take a couple years for our little guys to reach that size. But a definite perk of blue crab research is having connections with watermen who are willing to share in the Bay's bounty!*



# 2015 Michael Castagna Student Research Grant Update

Awardee: Lydia Bienlien  
Virginia Institute of Marine Science

*“Influence of Perkinsus marinus infection on levels of human-pathogenic Vibrios in aquacultured oysters”*

The eastern oyster *Crassostrea virginica* plays important roles in the ecology of Atlantic and Gulf Coast estuaries, but overharvesting, habitat destruction, and, recently, diseases caused by protozoan parasites have diminished the numbers and economic importance of oysters. In response to the loss of wild populations, there has been rapid growth in oyster aquaculture which is already revitalizing this industry.

A current issue in oyster aquaculture is the association of human-pathogenic *Vibrio* bacteria with product marketed for raw consumption during the summer. *Vibrio vulnificus* is a serious concern as it is the leading cause of seafood-borne mortality. *Vibrio parahaemolyticus* is mostly known for causing gastroenteritis, and in the US it is recognized as the leading cause of gastroenteritis associated with seafood consumption. Both of these bacteria naturally occur in estuarine and coastal waters and are concentrated by oysters as they filter feed. Salinity and temperature are important controlling factors of *Vibrio* dynamics depending on the species and the geographical location.

The threat to human health and to the economic well-being of the oyster aquaculture industry makes management of vibrios an urgent priority. Identification of the factors influencing occurrence and densities of *Vibrio vulnificus* and *Vibrio parahaemolyticus* in oysters is fundamental to better managing the risks associated with these bacteria. An important question is, ‘what drives the variability in *Vibrio* levels between oysters, causing some to harbor particularly high levels of potential pathogens?’. For my research I asked whether *Perkinsus marinus* (dermo) could be contributing to the variability in vibrio load through its own variability in infection intensities. In pursuing this question, I also investigated the relationship between vibrios and other pathogens such as *Haplosporidium nelsoni* (MSX).

The intersection of the *C. virginica*-*Vibrio* system with the oyster pathogens *Perkinsus marinus* and *Haplosporidium nelsoni* has received little attention. Both pathogens have been critical biotic influences on oyster populations. The dominant oyster pathogen of the East and Gulf coasts, *P. marinus*, infects nearly all oysters of market size in Virginian waters. These infections are characterized by significant disruption of epithelial tissues, particularly in the gut, along with infection of oyster hemocytes. These oyster tissues are the same tissues which harbor vibrios. This proximity could lead to *P. marinus* infections influencing the bacteria’s occurrence within the oyster. Perhaps the parasite and its extracellular secretions make the oyster tissue unsuitable for *Vibrio* proliferation; or, conversely, sickened oysters may have trouble managing bacteria leading to higher levels of *Vibrio* species. A thorough analysis of the potential effect that *P. marinus*-related disease severity may have on *Vibrio* species levels was the focus of this project.

Sub-market sized oysters from the Aquaculture Genetics and Breeding Technology Center (ABC) were placed in the York River at Gloucester Point, VA, where *Perkinsus marinus* is enzootic and both *Vibrio* species are present. Oysters were sampled bi-weekly (n = 40/week) from August to October when *Vibrio* levels and *P. marinus* levels are typically high. Oysters were processed for standard paraffin histology and the remaining tissues not used in histology were homogenized individually for subsequent molecular quantification of *P. marinus* and both *Vibrio* species of interest. This individual treatment of oysters for quantification versus pooling of samples was a unique approach to the study of *Vibrio*-parasite relationships. The incorporation of histology was novel, and allowed assessment not just of total parasite numbers, but parasite distribution, tissue damage, and other histological factors that might be influencing the potential interaction between parasite and bacteria.



Quantitative PCR (qPCR) was performed for *Perkinsus marinus* detection and, following an enrichment serial dilution, qPCR was also performed for *Vibrio vulnificus* and *Vibrio parahaemolyticus* detection. In addition, qPCR was run for pathogenic strains of *V. parahaemolyticus* possessing the thermostable direct hemolysin (*tdh*) gene and/or the thermostable related hemolysin (*trh*) gene. Histological characterization of *P. marinus* and *H. nelsoni* infection intensities are being performed with intensities of each rated *heavy*, *moderate*, *light*, or *rare*. Additionally, a more detailed set of analyses for *P. marinus* (and *H. nelsoni* and other parasites and pathogens) is currently being conducted to determine the relationship of both *Vibrio* species levels to infection intensity but also to parasite tissue distribution and to disease-caused tissue damage.

Molecular results thus far have revealed that most oysters harbored both parasite and bacteria, but there was no apparent correlation between levels of *Perkinsus marinus* and *Vibrio* species in oysters from the field. The variation seen in levels of *Vibrio* was not explained by the presence or intensity of infection by *P. marinus*. Histological analyses completed thus far have also indicated no relationship between severity of dermo disease and *Vibrio* levels. Interestingly, *Haplosporidium nelsoni* has been observed histologically at greater frequency in oysters with higher levels of *Vibrio vulnificus* and *Vibrio parahaemolyticus* than in oysters with lower levels of the bacteria. Analysis of additional samples will provide a more robust evaluation of whether a relationship between *Vibrio* species and *H. nelsoni* may exist, though it is noted that *H. nelsoni* prevalence in aquacultured oyster populations tends to be low (under 10%), in sharp contrast to dermo infection levels which is nearly 100% in salinities above 10 ppt. Regardless of the MSX results, it is clear from my study that infection and disease in oysters does little to explain the variability they display in *Vibrio* levels.

## **KNOXVILLE** **is just around the corner!**

The following from the Knoxville Tourist Bureau sums it up nicely:

“From classical music to Bluegrass, Country to Rock’n’Roll, Knoxville is one of the USA’s most vibrant cities for live music, offering free concerts most days of the week. This lively city is also home to museums and galleries, including The Knoxville Museum of Art. With a focus on farm-to-table fare its culinary scene is on the rise thanks to a group of talented chefs and local craft breweries. Name one of ‘American’s Best Adventure Towns’ by National Geographic, Knoxville features more than 50 miles of nature trails within the city limits, just minutes from the vibrant, pedestrian-friendly downtown.”

To that, add the fact that the Marriott Hotel is an outstanding venue and a short walk to everything described above and more.

The Program is shaping up nicely (still time to plan a session!) – see the web page for details. Remember, this will be our Silver Anniversary Auction, and there is a special session this year for undergraduate presentation. Make your plans now for what promises to be another great week with your NSA friends and colleagues.

*See you in Tennessee!*  
*Sandy Shumway*



**ABSTRACT DEADLINE:**  
**DECEMBER 1, 2016**



**NEW MEMBER CAMPAIGN**  
**IS UNDERWAY -**

**GET A FREE REGISTRATION**

You can earn a free registration for the Knoxville meeting by recruiting 10 new members to the NSA. It's easy, just takes a little initiative and power of persuasion. We all work with colleagues who are not members of the NSA - convince them to join! Be sure that your students are all members. If you are willing to take promotional materials to other conferences, we can provide you with advertising material, membership brochures, back issues of the Newsletter and *JSR*. They can be shipped for you, nothing to carry. As you recruit, be sure to notify Linda Kallansrude so that she can keep track of who gets credit for the new members. (And Sandy has agreed to keep recruiting, but not to participate in the contest).

## Special Sessions for the 109<sup>th</sup> Annual Meeting

If you have an interest in any of these sessions, contact the organizers. There will be other general sessions as determined by abstract submissions.

*There is still time to organize a special session.*

If you are interested in doing so, contact Sandy Shumway (sandra.shumway@uconn.edu)

Session Title	Session Chair(s)	Email Address
<b>Comparative Genomics</b>	Marta Gomez-Chiarri Steven Roberts Dina Proestou	gomezchi@uri.edu sr320@u.washington.edu dina.proestou@ars.usda.gov
<b>Contaminants of Emerging Concern</b>	Aswani Volety Evan Ward	voletya@uncw.edu evan.ward@uconn.edu
<b>Larval Shells</b>	George Waldbusser Jake Goodwin	waldbuss@coas.oregonstate.edu jgoodwin@marine.rutgers.edu
<b>Mussels</b>	Carter Newell Aad Smaal	musselsandoysters@gmail.com aad.smaal@wur.nl
<b>Modelling Marine Bivalve Diseases – Transmission and Climate Controls</b>	Eileen Hofmann Eric Powell	hofmann@ccpo.odu.edu eric.n.powell@usm.edu
<b>Food Security, Nutrition and Aquaculture</b>	Eddie Allison	ehal@uw.edu
<b>Apple Snails</b>	Shirley Baker	sbaker@ufl.edu
<b>Physiology</b>	Lewis Deaton	led9784@louisiana.edu
<b>New Perspectives on Perkinsus Parasites</b>	Ryan Carnegie Kim Reece	carnegie@vims.edu kreece@vims.edu
<b>Down on the Farm</b>	LeRoy Creswell Julie Davis	creswell@ufl.edu Julie.Davis@scseagrant.org
<b>Genetics</b>	Stan Allen Ximing Guo Louis Plough	ska@vims.edu xguo@hsrl.rutgers.edu lplough@umces.edu
<b>Biom mineralization and Biomaterials</b>	Andy Mount Karolyn Hansen	mount@clems on.edu khansen1@u dayton.edu
<b>Crustaceans</b>	Rom Lipcius	rom@vims.edu
<b>Clams</b>	John Scarpa	John.Scarpa@tamucc.edu
<b>Shellfish Initiatives</b>	Tessa Getchis	Tessa.getchis@uconn.edu
<b>Bivalve Molluscs as Food, Structure, Habitat, and Ecosystem Engineers</b>	Kay McGraw Steve Allen	kay.mcgraw@noaa.gov stevenmallen@gmail.com
<b>Undergraduate Research Colloquium</b>	Edward Catapane	catapane@mec.cuny.edu



## *A glimpse of the past - a plea for the future*

I received a parcel of old NSA *Newsletters* from John Scarpa and they have been scanned and are now included with the collection on the NSA web page. I also read them - again. Here is a snapshot of NSA between 1981 and 1985 - much has changed and much has not over that 35 year span.

**1981** - many of our current members were not yet born - annual dues were \$12, and there was a total of \$8,769.51 in the checking account and \$7,849.36 in savings. Herb Hidu was President, Winston Menzel, Phil Butler, and John Glude were made Honored Life Members; Vic Burrell was in charge of Audit-Budget-Finance, Sung Feng was the Program Chair, John Manzi was chair of Resolutions and Rich Lutz Chaired Publications. Scott Siddall began his long and dedicated tenure with the NSA as Member-at-Large. The minutes of the annual meeting were mimeographed on colored paper. Thirty two people were 'approved' as new members including Stan Allen, LeRoy Creswell, Chris Langdon, and Bruce MacDonald. The *Journal of Shellfish Research* was officially launched with Bob Hillman at the helm. **1982** - Neil Bourne was President, the first poster session was held during the annual meeting, two honored life members passed, Jim Engle and Lyle St. Amant. There were 529 active members and 110 delinquent members - about the same numbers and ratio as last month. More new members (50) were proposed (new members were actually vetted and voted upon by the EXCOM) including John Commito, Carter Newell, Barry Costa-Pierce, Bob Prezant, Clyde Roper, John Scarpa, and John Volk. The entire meeting program was printed in the Newsletter. October, 1982 - Scott Siddall took on Editorship of the Newsletter, Vic Burrell was President, 109 new members were approved, Mel Carriker took on leadership of the Publications Committee, and the first of several surveys was held to consider changing the name of NSA to reflect the international character of the organization. **1983** - Carter Newell organized the first annual (was there a second?) Hillbilly Band, 21 new members were accepted, including the first true 'life time member', Rebecca Ashley Lutz, whose forward-thinking parents signed her up for membership at birth. Mike Castagna received the Wallace Award and Roger Mann took the reigns at the *Journal of Shellfish Research*. There were 6 (yes, 6) technical sessions and 5 posters at the 1984 annual conference. **1984** - Bruce Barber won the Thurlow Nelson Award, Hal Haskin received the Wallace Award, and Laurie McHugh was named an Honored Life Member. From the Newsletter: "Neil Bourne reported that aquaculture had become an important topic in Canada and that the lead was being assumed by the Department of Fisheries and Oceans. Ken Chew reported that the U.S. Department of Agriculture would probably be playing a more important role in aquaculture in the future". And, enter the future, "Scott Siddall and Bob Malouf suggested that the Association's records be managed on a microcomputer rather than on the current file cards. Scott offered to use his computer temporarily for this purpose, but noted that NSA should consider the purchase of its own equipment. The EXCOM agreed and authorized Scott to transcribe the card file onto computer disks". Brian Beal was listed as a 'missing member' along with Jim Perdue and George Krantz (they have all since been found), and Susan Ford took on Newsletter Editor duties.

During this entire time period, NSA held their annual meetings in conjunction with SINA (Shellfish Institute of North Ameri-

ca) - a relationship that prospered for some time, but eventually NSA chose to meet independently - and less luxuriously (see *Taming of the Oyster* for a more detailed explanation). In fact, see *Taming of the Oyster* for a lot of interesting information about the formation, trials, tribulations, successes and growth of the National Shellfisheries Association. Wallace and Nelson and Gunther and Bourne and Chew are not just names on plaques. Carriker and Castagna and Abbe are not just names that the NSA decided to give to student research awards. All of these individuals made significant contributions to the NSA and to the field of shellfish biology and fisheries, and laid the groundwork for what is transpiring today.

The National Shellfisheries Association is a society and, as it moves forward, it is important that members have an understanding of what went before and appreciation for those who gave generously of their time, effort, and expertise to make it the success that it is today. Corporate memory is important - it not only saves time and wasted effort when 'new' ideas are proposed that have been tried (sometimes repeatedly) and failed, when questions arise with regard to policies and procedures and traditions, and when recognizing individuals who have made a difference. It's also just a good idea to pay attention to what took place in the past and use that to build for the future.

The world is moving at a rapid pace, change happens in the course of seconds. E-mail, social media, and web pages make it easy to disseminate information (good or bad, accurate or not) instantaneously. Everything worth knowing isn't necessarily available on the internet or retrievable via cell phones! You are members of one of the oldest academic societies extant, take some time and get to know your society. Visit the web page and read some of those old Newsletters, take the opportunity at the annual conferences to talk with the more senior members, get to know them and their contributions to the field and to the NSA. You won't regret it and the NSA will have a better-informed and engaged membership ready to move into leadership positions and preserve the NSA, its goals and objectives, and, perhaps most importantly, its meillieur.

### *Sandy Shumway*

Note: Copies of *Taming of the Oyster* by Mel Carriker are still available and it is a very interesting read. Mel was one of our longest-standing and most dedicated members, a Past-President, and Honored Life Member. He undertook compiling and writing the NSA history out of simple dedication to the NSA - a selfless effort that should serve as an example to all. There is an on-going effort to collect past *Newsletters* and post them on the NSA web page. If you find any in your travels, please forward, they will be scanned and returned.





# The Connecticut Plan to Grow Shellfisheries and Shellfish Habitats

This summer, Connecticut Sea Grant and NOAA Fisheries announced the release of the draft Connecticut Shellfish Initiative Vision Plan (<http://shellfish.uconn.edu/news-2/>) for public comment. The plan includes recommendations established by a diverse group from industry, regulatory agencies, academia and citizens, and is the result of three years of fruitful discussions regarding the future of the State's commercial, recreational and natural shellfish resources.

Molluscan shellfish beds encompass 80,000 acres, or nearly 20% of the area of Long Island Sound. The state's commercial shellfishing and aquaculture industry provide over three hundred jobs and farm-gate revenue in excess of \$30M dollars. Recreational shellfishing is offered in many coastal towns and permit sales alone generates \$100,000 dollars. Filter-feeding shellfish improve water quality, provide homes for marine animals and shellfish reefs buffer coastlines against storm damage. The oyster, known for its esteemed reputation for quality has been so important to the Connecticut economy that in 1989 the General Assembly designated it the state's shellfish.

In 2013, a diverse group of shellfish interest groups met to discuss challenges facing the state's shellfish sectors. Subsequently, Connecticut Sea Grant and NOAA Fisheries facilitated a series of public meetings to gather public input on how to grow shellfisheries and shellfish habitats – and the Connecticut Shellfish Initiative or CSI was born. Public and steering committee discussions led to a long list of priorities that were debated and revised until consensus was reached on most. This Fall, a detailed implementation plan will be developed that includes specific actions and a timeline for each recommendation.

Along the way, it became increasingly apparent that to garner public support for this growth, increasing public awareness about *all things shellfish* was a must. "Ask around and you get the sense that we have lost our connection to the sea," says Dick Harris, retired Director of Harbor Watch, a local water quality monitoring and research program. These words didn't surprise those of us listening to him speak at a recent workshop. A large portion of the shoreline is privatized and access to some areas is limited. Couple that with the fact that the majority of Connecticut shellfish are shipped out of state, rarely making it to local markets, and you start to realize why people may not know about these marine treasures growing right in their backyard. Reconnecting citizens with the State's shellfish heritage, and making sure they had access to local shellfish rose to the top of the list of CSI priorities.

Connecticut Sea Grant recently funded a study to explore what citizens know about the state's shellfish resources. A mobile display, featuring images and text describing Connecticut's shellfish and shellfisheries was created and displayed at shellfish-themed public events in coastal towns in 2015 and 2016. At those events attendees were surveyed to gauge their awareness of Connecticut's shellfish heritage. The survey included knowledge-based questions about Connecticut's shellfish sectors. Nearly 500 people have responded. The responses to date (the project is ongoing) were sorted by zip code to yield town-specific information. An overwhelming majority of participants were unable to answer all questions correctly. Individuals from inland towns scored lower than those living in coastal areas, and interestingly, residents of towns where commercial activity exists scored higher than respondents in all other groups.



*Four boys enjoy a day learning all about shellfish and shellfishing at the Town of Madison Clam Dig. Photo courtesy of Lorene Livingston, Connecticut Sea Grant. Permission for youth photo granted.*

These results present a great opportunity to plan activities that increase public engagement about Connecticut's shellfisheries and shellfish habitats. Sea Grant staff plan to use the information from this pilot study and from a more comprehensive survey planned for later this year to drive future public education campaigns and outreach programs on Connecticut shellfish and shellfisheries.

In the meantime, keep an eye out for Connecticut shellfish in local marketplaces and eateries. They're making a (delicious) comeback!

**Tessa L. Getchis**  
*Extension Educator, Connecticut Sea Grant and UConn Extension*

Register Early for the Best Rates!

Northeast Aquaculture 2017

A joint meeting of the

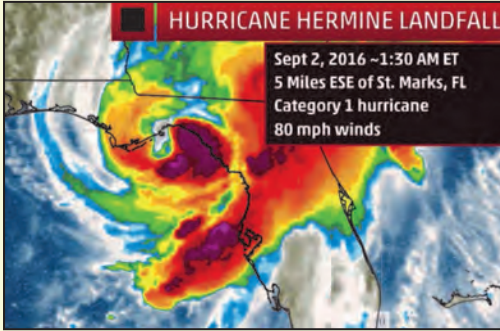
Northeast Aquaculture  
Conference & Exposition  
and the  
Milford Aquaculture Seminar

January 11-13, 2017  
Omni Hotel & Resort  
Providence RI, USA

Abstract Submission Deadline is October 15, 2016

[www.northeastaquaculture.org](http://www.northeastaquaculture.org)

# Hurricane Hermine Meets Her Match in Cedar Key



Hurricane Hermine roared ashore in the wee hours of September 2, 2016, making landfall in Florida's Big Bend region. This area is home to the small town of Cedar Key, a popular tourist and fishing destination, and known for its successful shellfish aquaculture industry. The storm was accompanied by heavy rainfall and winds of up to 80mph, downing trees and powerlines, and damaging homes across the state.

Cedar Key residents and business owners prepared for Hurricane Hermine as they had for Tropical Storm Colin (which occurred in June 2016 and had a similar on-shore track) by moving possessions indoors. What caught everyone by surprise, however, was the storm surge. The synergistic combination of landfall (1:30 am) and high tide (3 am) produced a storm surge reported at 5.8 ft. In Cedar Key, storm damage was estimated at over \$10 million. Thankfully, no one was injured.

The shellfish aquaculture businesses of Cedar Key sustained variable types and extents of damage, depending upon location. Docks were mangled and equipment damaged. Bags of seed clams recently planted on lease sites were washed away. One clam processing business experienced an electrical fire, leaving little more than a cinderblock shell. Fortunately, the Shellfish Aquaculture Research and Education Facility bore little damage. And the water quality monitoring station, located at the Gulf Jackson lease area off Cedar Key, continued to record throughout the storm.

The shellfish industry of Cedar Key is resilient and the town is a community where everyone supports each other. Within hours of the storm, a great deal of cleanup and repairs had already been done. Farmers have stepped up to share equipment with those who sustained more damage than they. Businesses are re-opening daily, and the town went ahead with their annual Pirate Festival and Coastal Cleanup, only two weeks after the hurricane.

While the people of Cedar Key are upbeat, it will be a long road to recovery for the shellfish aquaculture industry in general, and especially for those who lost not only their businesses but whose homes were also damaged. A Hermine Recovery account has been established by the Cedar Key Aquaculture Association to help remove farm-related debris, re-establish Aids to Navigation on lease sites, rebuild infrastructure (hatcheries, nurseries, processing plants, docks), and purchase shellfish seed. Donations are tax-deductible and can be mailed to the Cedar Key Aquaculture Association, PO Box 315, Cedar Key FL 32625. Please include "Hermine Recovery" on the memo line.

**Shirley Baker**  
*University of Florida*



*Heath Davis, Mayor of Cedar Key, is inspecting 2<sup>nd</sup> Street by boat on September 1, 2016. Davis also owns and operates Cedar Key Seafarms, a family-run clam and oyster growing facility and wholesaler (<http://cedarkeyseafarms.com>). Photo courtesy of Pat Bonish – Bonish Studio.*



## Future NSA meetings

**2018: Seattle, WA**

**2019: Aquaculture '19 New Orleans, LA**

**2020: TBD**



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## Upcoming Events

**70<sup>th</sup> Annual Shellfish Conference (PCSGA/NSA-PCS):** October 10-14, 2016. Chelan, Washington (USA). For more information, visit: <http://pcsga.org/annual-conferences/>

**Northeast Aquaculture Conference and Exposition:** January 11-13, 2017. Providence, Rhode Island (USA). For more information, visit: [www.northeastaquaculture.org](http://www.northeastaquaculture.org)

**109<sup>th</sup> NSA Annual Meeting:** March 26-30, 2017. Knoxville, Tennessee (USA). For more information, visit: [www.shellfish.org](http://www.shellfish.org)

**21<sup>st</sup> International Pectinid Workshop:** April 19-25, 2017. Portland, Maine (USA). For more information, visit: <http://ipw2017.com>.

**11<sup>th</sup> International Conference on Molluscan Shellfish Safety:** May 14-18, 2017. Galway, Ireland. For more information: <http://www.conference.ie/Conferences/index.asp?Conference=451>

For more information on these conferences:  
[www.was.org](http://www.was.org)

**LAQUA '16:** Nov.8 - Dec.1. Lima, Peru

**Aquaculture America 2017:** Feb. 12-22. San Antonio, Texas, USA

**World Aquaculture 2017:** Jun. 27-30. Cape Town, South Africa

**Asia Pacific Aquaculture 2017:** Aug. 26-29. Johor Bahru, Malaysia

**Aquaculture Europe 2017:** Oct. 16-20. Dubrovnik, Croatia

**Aquaculture America 2018:** Feb. 19-22. Las Vegas, Nevada, USA

**AQUA 2018:** Aug. 25-29. Montpellier, France

**Aquaculture 2019:** Mar. 6-10. New Orleans, Louisiana, USA

**Aquaculture 2022:** Feb. 27-Mar. 3. San Diego, California, USA

**Aquaculture America 2023:** Feb. 19-22. New Orleans, Louisiana, USA

If you would like to announce a meeting, conference, workshop, or publication that might be of interest to NSA members, please contact the *QNL* Editor, LeRoy Creswell ([creswell@ufl.edu](mailto:creswell@ufl.edu)).