National Shellfisheries Association
Quarterly Newsletter
Est. 1908
2021(1)

President's Message

Our Annual Meeting is almost here, as is spring in the Northern Hemisphere and autumn in the Southern Hemisphere. This is a time of change for Mother Nature and for many of us as we change modes with the seasons, academic year, or production cycle. The National Shellfisheries Association Annual Meeting changed this year to a virtual meeting after having to cancel completely the year before because of the pandemic. My change will be to become the Past-President of our wonderful Association as I hand over the reins to incoming President, Lewis Deaton. Thank you, members, for your support, input, and assistance as the Executive Committee and I dealt with issues, from internal to global, through the Association's 112th and 113th years. Our Association is only as strong as its members. You showed that strength through the divergent issues (e.g., meeting cancellation, Black Lives Matter) we faced during my tenure as President.

Thank you for attending the upcoming Annual Meeting, even if just for a day, although I expect you will attend the whole meeting and enjoy every aspect. We have a full slate of oral and poster presentations from which you will find interesting topics. Make time to attend the different plenary talks and smaller sessions, such as the awards ceremony, just as if you were attending the meeting in person.

This year will be another one of challenges. Total membership is steady, but we need our students to continue their membership as they progress in their careers and for all of us to continue to be ambassadors for our Association and recruit new members. Thank you to those that donated to the Student Endowment Fund that supports our student members as the begin their professional career. Please continue to submit your papers to our award-winning *Journal of Shellfish Research*, which is supported by page-charges and not your membership dues; access to the *Journal* and its back issues on-line is a perk for being a member.

My journey as President of the Association was only possible with the support of each of you, the Executive Committee, and contract workers that keep the Association operating in the background. Thank you all for your support. Thank you to the members that served on ad hoc committees for your knowledge and time to assist our Association as it changes with the needs of society. If any member wishes to volunteer in any manner, from assisting with our social media (you are following us on Facebook and Instagram, right?) to serving on the Executive Committee, contact us and let us know. Become an active part in your organization. It is well worth your time and effort.

John Scarpa, *President*

Registration Deadline

March 15, 2021

www.shellfish.org

Questions: info@shellfish21.com

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R. LeRoy Creswell

Oct. 11, 1950 - Oct. 27, 2020

Have you ever had that feeling of excited anticipation of meeting, visiting, or working with a certain individual, a person whom you admire? An individual who would always engender personal feelings of comfort in his/her presence with a corresponding desire to engage? LeRoy Creswell was that person. He had those special personality traits that would 'beckon you'. Sadly, opportunities to personally engage with LeRoy will no longer be, but memories of him and the impact that he made will live on in us and through the legacy he established. LeRoy passed away on October 27, 2020, after a prolonged bout with cancer, ever stating that he was going to beat it, while also proclaiming that he was so proud of his family and thoroughly satisfied about what he was able to accomplish during his professional career.

So many of us in the fisheries and aquaculture communities have been significantly influenced and in some cases 'transformed' for the better through our interactions with LeRoy. He had a career that spanned 40 years, characterized by an array of accomplishments and contributions associated with activities that included research, administration, and outreach. He notably had the uncanny ability to effortlessly and effectively move in and out of these sectors with ease. On one day he would be interacting with individuals representing state and governmental agencies, and on the next he would be answering questions about fisheries and aquaculture posed by wide-eyed children.

My relationship with LeRoy, described within this tribute, will undoubtedly typify those of countless others who knew him. Reading these words that I have written will undoubtedly engender memories of what he meant to each of us. He was an individual who welcomed challenges and the adventure and unknown that accompanied them. He was always motivated by a desire to make a difference, whether short term, long term, or both. He selflessly devoted his time to engage with others who sought his guidance, whether they were students thirsty for his experiential knowledge, commercial fishermen striving to make a transition from capture fisheries to culture fisheries (aquaculture), or colleagues like myself.

A partial examination of what he accomplished during his career aptly illustrates what a unique individual he was. After completion of graduate study at the University of Miami, LeRoy joined the professional staff at Harbor Branch Oceanographic Institution. He began by being awarded grants from the Florida Department of Agriculture to develop management practices for the subtidal culture of oysters and clams. These efforts were soon complemented by educational activities that included manuals, workshops, and training programs. This work led to the successful introduction of commercial fishermen to shellfish culture and the development of a thriving industry that exists today, centered along the panhandle of Florida. This success was based on an uncanny ability to relate and effectively communicate with the clientele. In 2000, he began working at Florida Sea Grant as an Extension Agent in St. Lucie County and that same year received the Wallace Award, in recognition of his outstanding contribution to the promotion and expansion of the shellfish aquaculture industry in Florida through the combined efforts of industry, federal funding, and the academic community. In 2011, he assumed the position of Extension Program Manager for Florida Sea Grant, serving in this capacity until his retirement in 2019. He epitomized what was potentially possible when academia effectively collaborated with industry. Always filled with boundless energy, and insatiable in his pursuit to learn, develop, and apply, he relished thinking out of the box. During his career, the dimension of his pursuits included investigations of potential of culture of other marine species such as the angel wing clam, ornamental shrimp species, spiny lobsters, queen conch, and green sea urchins as fisheries resources.

The respect and admiration that LeRoy gained and commanded ultimately led to service in elected positions of leadership in an array of scientific societies and associations. His most notable service positions include President of the National Shellfisheries Association (2011-2013), the World Aquaculture Society (1994-95), the Florida Association of Natural Resource Extension Professionals, and a Director of the Gulf and Caribbean Fisheries Institute. During his tenures in these positions, he was often involved in the planning and organization of annual scientific conferences. He was Executive Secretary and Senior Editor of the *Proceedings of the Gulf and Caribbean Fisheries Institute* for the past 18 years. At his death, Leroy was Editor of the *Quarterly Newsletter*. One of his sometimes unknown contributions was a book titled *The Aquaculture Desk Reference*, a practical source of diverse information used by research and industry sectors for the past 27 years.

LeRoy was always in your corner, always enthusiastically responding to requests for help, and excited about what might be the outcome. He once readily consented to my request to give a lecture on management practices associated with oyster culture to my aquaculture class at Mississippi State University. Not finding a flight that would work to meet the date of the class meeting did not stop him. He traveled by train to nearby Tuscaloosa, Alabama, from where he planned to drive the remainder of the trip by rental car. While waiting for him to arrive, I received a phone call asking that he be picked up at the train station. Curious, I asked why and he simply responded that he was unable to rent a car because his driver's license had expired. That was vintage LeRoy, giving his time to meet my request while obviously forgetting about renewing his license.

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I presume that not many know that LeRoy was an accomplished musician, a drummer in a band, and always enjoyed talking with fellow musicians. His musical talents came to my attention when we were at the 1996 World Aquaculture Society annual meeting in Bangkok, Thailand. Past and present US members of the WAS leadership at that time were asked by the hosts to perform something that was representative of the US. LeRoy rose to the occasion and took out his harmonica and played the folkloric song, Oh Susannah, as we sang the lyrics. Our efforts were accompanied by gracious smiles and laughter.

How are we to remember LeRoy within the array of communities in which he played such an integral part? By remembering his contributions as founded in his being a selfless, compassionate person, always thinking of, and genuinely interested in others. It seemed that he innately knew that his role was to help enhance all of the unique and special gifts that he saw in people. As a result, where he saw the need, he unpretentiously gave. Invariably, mutual benefits were realized from this approach. All of his diverse roles were dedicated to enforcing the role of science in protecting all fisheries through wise use and management while expanding their role as a contributor to food security.

Leroy leaves his wife, Danita, and two daughters, Leala and Alonnah. With love of LeRoy the man and his personal effect on our lives, we move on, challenged and motivated by his legacy. To complement what I have written about LeRoy's life, testimonials that I personally solicited from individuals who shared in different aspects of his career follow.

Lou D'Abramo, Mississippi State University (retired)

"LeRoy encouraged and inspired every person he met using his wisdom, smile, connections, and compassion. We met as queen conch aquaculture pioneers 40 years ago; LeRoy was a mentor, a friend, and a colleague and we always shared a love for Caribbean aquaculture and communities."
Megan Davis, Florida Atlantic University

"LeRoy was a force of nature and one of my oldest and dearest friends - of about 40 years. He was passionate about his family, his four-legged adoptees, his friends, his science, and his desire to share information. He was a regular source of down-home wisdom, shellfish biology, humor, joy, and amusement. He was also a great confidante. His genuine enthusiasm for life and his willingness to give of his time and expertise will live on in all those he helped along the way. I talked to him just before his last surgery and he told me he had a great family, great friends, and no regrets. I believe he was happy and content. LeRoy was a highpoint in my life and won't be forgotten."
Sandra Shumway, University of Connecticut

"LeRoy Creswell was that vital repository of knowledge regarding the culture and utilization of marine shellfish in the Gulf and Caribbean ... that pool of corporate knowledge that will be so greatly missed by so many. His vast technical knowledge, however, was in fact exceeded by his kindness, his willingness to serve, and his enthusiasm for the science. We were fellow musicians and could talk forever about our musical 'careers' and experiences."
Chuck Adams, University of Florida (retired)

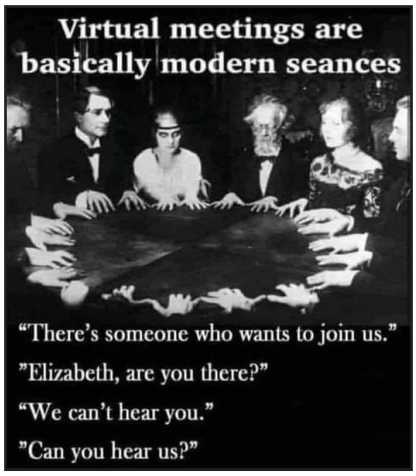
"LeRoy was one of those very special people who was liked by everyone, who treated others with respect, and who was always there if you needed him, whether it was a 2 AM water exchange, consulting on grow-out methods or leading field work in the Caribbean. I was LeRoy's Advisor at Rosenstiel School of Marine and Atmospheric Science for his Master's degree, but in fact he was always a valued colleague, friend, and advisor to me and many others through his work in aquaculture and the environment. His positive outlook on life remains a great model for us all, and he is sorely missed. Godspeed, LeRoy!"
Scott Siddall (retired)

"LeRoy served as the Executive Secretary and Senior Editor of the annual Gulf Caribbean Fisheries Institute Proceedings for the previous 18 years. He was an institutional pillar, not only through his official responsibilities, but also through the generosity and warmth he gave to all, especially to students and early-career professionals ready to become part of the GCFI family. In life, he was a charismatic presence, generous with his knowledge and wisdom, and a clarion voice for marine aquaculture and sustainable resource management in the U.S. and the Caribbean. His contributions to GCFI will remain with us forever."
Bob Glazer, Executive Director, Gulf and Caribbean Fisheries Institute

"Leroy, an invertebrate biologist and aquaculturist, was one of the founding fathers of shellfish aquaculture in Florida. Working with colleagues at Harbor Branch Oceanographic Institution in the 1980s, he developed alternative culture methods suitable for the state's subtidal, subtropical conditions (soft bottom bags for clams and flexible belt for oysters), wrote practical manuals on these methods, and introduced hundreds to the potential of shellfish farming. His pioneering efforts led to an industry valued today at USD $20 million and supports over 350 small farms."
Leslie Sturmer, University of Florida, IFAS Extension

A remembrance video for LeRoy is available: *https://www.haisleyfuneralhome.com/obituaries/Roger-Creswell/*

The 113th Annual Meeting is Almost Virtual Reality!



The conference is well in hand, the program has been posted on the NSA website, and it looks like a great week is in store. The only major drawback is that we won't be able to enjoy all of those fun and engaging discussions around the posters and local watering holes. This has been a learning experience for everyone involved and the planning and organization would be nothing without the very talented assistance of Noreen Blaschik Favreau, the new NSA Secretariat, and the technical prowess of Eric Heupel and Todd Fake. The GreenFin company (Maryland) has been engaged to handle the meeting platform and all indications are that we will have a very successful conference.

There are almost 400 presentations included in the program and several special presentations. All of the plenary lectures will be live presentations, there are focused workshops and discussions on Aquaculture and the Press, two poster sessions (bring your own beverage!), a lecture/discussion on diversity and inclusion excellence, a job panel being sponsored by the Recruits, a workshop on mussel aquaculture expansion (NAEMO), and the eastern oyster genome consortium. A special thanks to Dr. Acacia Alcivar-Warren and the FUCOBI Foundation who have joined forces to sponsor participation and membership of over 90 students.

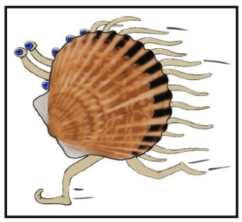
- The final schedule and instructions for presenters are posted at www.shellfish.org
- Meeting **REGISTRATION deadline is MARCH 15th**
- **PRESENTATIONS** (both oral and poster) **must be uploaded to the virtual portal by MARCH 8th**
- Be sure to **DOWNLOAD the ZOOM CLIENT APP** to your computer, the web-version does not have all the features you may need

All of our very generous sponsors have continued their sponsorship for this virtual version of the conference and there are trade show participants. Their presentations will be available throughout the meeting. Please take some time to view them and visit their web pages and thank them for their support.

There will be a silent **AUCTION** so please take the opportunity to bid on some really great items and support the Student Endowment Fund. The bidding will be 'open' throughout the conference and winners announced at the closing Happy Hour.

We are looking forward to 'seeing' you all at the meeting. There's still time to register (www.shellfish.org), and FULL MEETING registrants will have access to all of the conference presentations for two weeks post-meeting, so no worries about missing concurrent talks - one of the few benefits of meeting virtually.

Scallop Gallop
Virtual 5K



Contact Lewis Deaton:
lewis.deaton@lusfiber.net

A very big thank you to everyone who has submitted a presentation or registered for the conference, sponsors, and trade show participants. Your support during these difficult times is greatly appreciated and will ensure the future of the NSA.

See you in March!

The Conference Management Team

This is your *Newsletter*

Do you have an interesting story to tell? New research findings? A new technique? Have you read something that you think would be of interest to your fellow shellfish aficionados? Visited a unique shellfish-oriented location? Attended a relevant conference? If so, why not share the news with the NSA membership? Send along your information for possible inclusion in the *Newsletter*. Encourage your colleagues and keep an eye out for pertinent stories. Even if you don't want to write something yourself, send your ideas and we'll see what might be arranged. The *Newsletter* is published quarterly, please keep it in mind as you go about your work and travels. Suggestions always welcome and we look forward to hearing from you!

Steve Allen, Editor (sallen@bowdoin.edu) and Noreen Blaschik Favreau, Associate Editor (Noreen.blaschik@uconn.edu)

Still Time to Register

The following is a list of sessions planned for the 113th Annual Meeting. If you want further information on any of the sessions listed, contact the organizer(s) directly.

Session	Organizers	Contact information
Aquaculture and the Press: A Way Forward	Rona Kobell	kobell@mdsg.umd.edu
Blue Crabs	Daphne Munroe Joseph Caracappa	dmunroe@hsrl.rutgers.edu joe92691@gmail.com
Blue Crab Genomics and Transcriptomics: the Progress of the Blue Crab Genome Project	J. Sook Chung	chung@umces.edu
Bivalve Ecosystem Services	Daniel Taylor	dtay@aqua.dtu.dk
Bivalves, Modelling, and Climate Change	Tom Soniat Eric Powell	tsoniat@uno.edu Eric.N.Powell@usm.edu
Cephalopods	Peter Kingsley-Smith Jeffrey Taylor Good	kingsleysmithp@dnr.sc.gov goodj@dnr.sc.gov
Clams	Brian Beal	Bbeal@maine.edu
Coastal Acidification	Shannon Meseck	shannon.meseck@noaa.gov
Commercial Shellfisheries	Kevin Stokesbury David Rudders	kstokesbury@umassd.edu rudders@vims.edu
Contaminants of Emerging Concern	Evan Ward Kayla Mladinich	Evan.ward@uconn.edu kayla.mladinich@uconn.edu
The Sea Grant COVID-19 Response to the Needs of the Shellfish Industry	LaDon Swann Kola Garber Charles Weirich Mark Rath	Ladon.Swann@usm.edu nikola.garber@noaa.gov charles.weirich@noaa.gov mark.a.rath@noaa.gov
Disease	Ryan Carnegie Roxanna Smolowitz	carnegie@vims.edu rsmolowitz@rwu.edu
Diversity & Inclusive Excellence Lecture and Discussion	Moderator: Aswani Volety	avolety@elon.edu
Down on the Farm	Leslie Sturmer	Lnst@ufl.edu
Eastern Oyster Genome Consortium Workshop	Marta Gomez Erin Roberts	gomezchi@uri.edu erin_roberts@my.uri.edu
Echinoids	Chris Pearce Stephen Watts	Chris.Pearce@dfo-mpo.gc.ca sawatts@uab.edu
Functional Genomics	Tim Bean	tim.bean@roslin.ed.ac.uk
Hatcheries	Don Webster	dwebster@Umd.edu
Mangrove Epigenome (MangroveENCODE) Project: A ONE HEALTH Approach (posters only)	Iris Hernandez Alfredo Quarto Jim Tang Acacia Alcivar-Warren	irisphotoes@gmail.com alfredo@mangroveactionproject.org jtang@mbl.edu environmentalgenomics.warren@gmail.com
Marine Field Stations (POSTER SESSION)	Dianna Padilla Brian Beal	dianna.padilla@stonybrook.edu Bbeal@maine.edu
NAEMO Workshop: Defining Barriers and Identifying Solutions for Mussel Aquaculture Expansion	Åsa Strand Julie Webb Alessandro Laudicella	 j.webb@bangor.ac.uk alessandro.laudicella@gmail.com
Offshore Wind Energy Development and Commercial Shellfisheries	Daphne Munroe Jennifer Beckensteiner Andrew Scheld	dmunroe@hsrl.rutgers.edu jbeckensteiner@vims.edu scheld@vims.edu
ONE HEALTH Epigenomes and Microbiomes: From Soil to People Workshop	Acacia Alcivar-Warren Kathy Tang	environmentalgenomics.warren@gmail.com ktangnelson@gmail.com
Oysters	Bill Fisher	fisher.william@epa.gov
Scallops	Richard Snyder Michael Acquafredda	rsnyder@vims.edu Michael.acquafredda@rutgers.edu
Seagrass Bivalve Interactions	Kay McGraw Brett Dumbauld	kmcgraw5@earthlink.net brett.dumbauld@usda.gov
Shellfish Aquaculture Business and Economics	Matt Parker Jonathan van Senten	mparke11@umd.edu jonat86@vt.edu
Shellfish Genetics/Genomics	Louis Plough Jon Puritz	lplough@umces.edu jpuritz@uri.edu
Shellfish Restoration and Conservation	Peter Kingsley-Smith	KingsleySmithP@dnr.sc.gov
Shrimp Genome and Epigenome (ShrimpENCODE) Project	Acacia Alcivar-Warren Kathy Tang	environmentalgenomics.warren@gmail.com ktangnelson@gmail.com
Summer Mortality	Tim Green	Timothy.Green@viu.ca
Undergraduate Research Colloquium	Ed Catapane Margaret Carroll	catapane@mec.cuny.edu margie@mec.cuny.edu
Vibrio	Steve Jones Cheryl Whistler	stephen.jones@unh.edu
General Contributed Papers		

The Power of Citizen Science to Monitor Harmful Algal Blooms in Aquaculture

Phytoplankton, also known as micro-algae, are microscopic organisms that live in both marine and freshwater. Like plants, phytoplankton have chlorophyll to capture sunlight and use photosynthesis to produce oxygen, energy and sugars. This ability makes phytoplankton the foundation of the aquatic food web, feeding everything from zooplankton to shellfish to whales. They can also be harbingers of disease and death. Certain species of phytoplankton are known to produce potent biotoxins which can harm human health and disrupt shellfish aquaculture. Harmful algal blooms (HAB) occur when species of phytoplankton grow very quickly, forming blooms which can discolor the water, often referred to as red or brown tides. These blooms have been observed in every US state, resulting in over $1 billion in losses over the last several decades to communities that rely on recreation, tourism and seafood harvesting. The direct economic impact of HAB does not include the socioeconomic impact from loss of subsistence harvest activities, disruption of cultural practices, water insecurity, food insecurity, and loss of social interaction tied to coastal resource use.

The National Phytoplankton Monitoring Network (PMN) is a community-based network of volunteers monitoring marine and freshwater phytoplankton for the presence of harmful algal blooms. Formed in 2001, PMN enhances the country's ability to respond to and manage the growing threat posed by HAB by collecting important data, including phytoplankton species composition and distribution, as well as local environmental conditions. Volunteer groups are trained on methods to collect and identify important marine and freshwater harmful algae and phytoplankton species through workshops and online webinars. The PMN supplies each group with plankton nets, thermometers, salt refractometers, and digital microscopes. Groups monitor sites either weekly or biweekly and report observations to NOAA using an online database or a smart phone application called *Phyto*.

Volunteer conducting a plankton sample. Photo credit: NOAA.

Phyto is a free smartphone application available on both iOS and Android platforms. The app includes a guide to identification using cell shapes, a photo library of important phytoplankton species, pronunciations of scientific names, links to harmful algal bloom news, and an identification game. A demonstration of some of the features in the *Phyto* application for IOS can be found at: https://youtu.be/rV8Z3MDpBIM. Volunteers send their preserved samples to the PMN office for confirmation using digital microscopy for quality assurance and quality control. Since the program's inception, hundreds of blooms have been identified by citizen scientists, including over 500 potentially harmful blooms, and 480,000 observations have been recorded, which are available through Data.gov, the federal government clearinghouse for environmental data collections.

Both the shellfish and finfish aquaculture industries have experienced direct adverse effects of harmful algal blooms from both toxin-producing species and non-toxin-producing species. For individual hatcheries and aquaculture farms, blooms of certain non-toxic phytoplankton are of paramount concern because they are known to cause mortality of shellfish and finfish worldwide. These species, sometime referred to as ichthyotoxic phytoplankton, harm shellfish and finfish by physical or chemical mediated effects. These effects include reduction of oxygen content of the waters, production of mucus, damaging gills by spines, and production of reactive oxygen. Some of the modes of action for these phytoplankton species are still unknown. For example, in the Chesapeake Bay, blooms of the dinoflagellate *Cochlodinium polykrikoides* caused a 20% mortality of juvenile eastern oysters (*Crassostrea virginica*) within 72 hours. In 2016, a single bloom of the non-toxin producing species *Chattonella* was responsible for the mortality of 39 million farm raised salmon worth nearly $800 million in Relonvavi Sound, Chile. The Phytoplankton Monitoring Network has modified its protocols to specifically monitor for all species known to have adverse effects on shellfish and finfish.

Brown Tide in Chincoteague Bay, Maryland. Photo Credit: George Boniello, Coastal Carolina University.

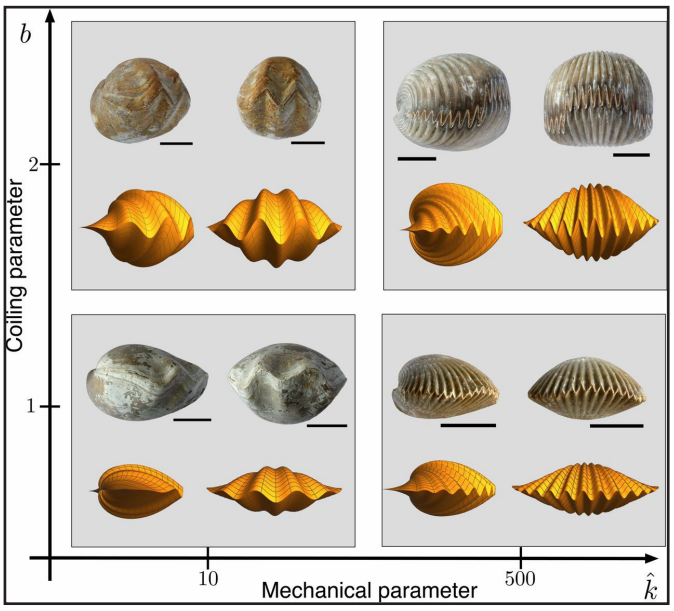
Currently, the Network is actively recruiting shellfish hatcheries and aquaculture farms to participate in this new citizen science initiative. Hatcheries and growers may benefit from receiving an early warning about possible local HAB. The National Oceanographic and Atmospheric Administration will provide all training and equipment required for monitoring these HAB species. Equipment include a plankton net, refractometer, collection bottles and a digital microscope. The training includes methods to collect and identify local phytoplankton and potential HAB species. Training is usually done online using video conferencing and takes approximately three hours. Participation in the program usually takes less than one hour per week. For further information about participating in the Phytoplankton Monitoring Network, contact Steve Morton (steve.morton@noaa.gov).

Steve L. Morton and Jennifer Maucher
National Oceanographic and Atmospheric Administration, Harmful Algal Bloom Monitoring and Reference Branch

A Perfect Fit - Math, Mechanics, and Bivalve Shells

Using math and mechanics, Derek Moulton (University of Oxford), Alain Goriely (University of Oxford), and Régis Chirat (University of Lyon) describe their approach to understanding the interlocking mechanism of bivalve shells in a paper published in *Proceedings of the National Academy of Sciences*.

They note that the bivalve shell displays an apparently mundane, yet striking feature from a developmental point of view: when the shell is closed, the two valve edges meet each other in a commissure that forms a continuum with no gaps or overlaps despite the fact that each valve, secreted by two mantle lobes, may present antisymmetric ornamental patterns of varying regularity and size. They also noted that even irregularities, whether natural or from an injury, do not generally prevent shells from neatly closing—and it works equally well in bivalves with either flat or wavy edges.



Morphology variety for (symmetric) interlocking bivalved shells and sample shells illustrating the diversity of form (Moulton et al., 2020).

To understand this process, the researchers derived a mathematical framework, based on the physics of shell growth, to explain how this interlocking pattern is created and regulated by mechanical instabilities. By close consideration of the geometry and mechanics of the two lobes of the mantle, constrained both by the rigid shell that they secrete and by each other, they uncovered the mechanistic basis for the interlocking pattern. Their modeling framework recovers and explains a large diversity of shell forms and highlights how parametric variations in the growth process result in morphological variation.

For more information: Derek E. Moulton, D.E., Goriely, A., and Chirat, Regis. 2020. Mechanics unlocks the morphogenetic puzzle of interlocking bivalved shells, *Proceedings of the National Academy of Sciences*, 117(1) 43-51: DOI: 10.1073/pnas.1916520116

Student Endowment Fund (SEF) Travel Awards

Increase in registration waiver applications!

The National Shellfisheries Association Student Endowment Fund (SEF) was established in 1989 to maintain and expand the participation of students in the NSA. Contributions to the NSA SEF are tax-deductible and are used to defray the costs associated with presenting oral and poster presentations at the Annual Meeting.

Each year the SEF typically grants a limited number of NSA travel awards in the form of either shared lodging or registration waivers to graduate students who will be presenting their original research at the Annual Meeting. Travel award recipients are then expected to help with NSA Annual Meeting needs for at least a half-day during the meeting (e.g., staffing the sales booth, operating A/V equipment). With the 2021 meeting moving temporarily to a virtual meeting platform, however, requests for accommodation waivers were easily handled this year - there were none – which meant that more registration waivers could be made available.

As a reminder, SEF Travel awards are now awarded by a lottery system requiring an application to be submitted to SEF Co-Chair Melissa Southworth by the abstract deadline (which was extended this year to January 11th 2021), but is typically December 15th for NSA Annual Meetings and November 15th during Triennial years.

Thirty-two student members applied for a registration waiver for the upcoming virtual NSA meeting. All students who applied received a waiver. Twenty-two of them were generously provided by the FUCOBI Foundation, with the other ten covered by the SEF.

Graduate Student Presentation Awards – A virtual meeting, but the show must go on!

While the experience for both presenters and judges will be a little different this year (with some thought given on how to adjust the judging criteria accordingly), Graduate students (not undergraduates) presenting their original research are encouraged to compete for the Nelson and/or Gunter presentation awards. To be eligible for an award, students must: 1) Be current members of the NSA at the time of abstract submission; 2) Present their original research as first author of the presentation. Recent graduates may also apply if: 1) they present research gathered while a student; and 2) they are within one year of receiving their degree.

The Thurlow C. Nelson Award is presented for outstanding oral presentations of original research. The award is named after the distinguished shellfish biologist who served as NSA President from 1931 to 1933, and contributed more than 125 papers, many relating to oyster biology. The Gordon Gunter Award is presented for outstanding poster presentations of original research. Recipients of both of these awards receive membership for two years in the Association as well as a certificate of accomplishment.

Given the change to a virtual meeting in 2021, your SEF co-chairs are working on minor tweaks to the judging criteria to account for the different presentation environment. To stay up to date, please check the NSA website (https://www.shellfish.org/sef-student-presentation-and-travel-awards). And for any non-student members who wish to help out with this year's judging, please remember to click the appropriate response when you register!

For questions about travel awards, presentation awards or anything else SEF-related, please feel free to contact the SEF Co-chairs: Peter Kingsley-Smith (kingsleysmithp@dnr.sc.gov) and Melissa Southworth (melsouth@vims.edu)

Peter Kingsley-Smith
Melissa Southworth
Student Endowment Fund Award Co-chairs

Bon Voyage, Linda!

Linda Kallansrude officially signed on as Secretariat of NSA in 2007, but she was a regular mainstay of NSA activities for over a decade prior to that. *Journal* invoices, web page issues, meeting registration, membership lists, chasing dues payments – all activities maintained by Linda. She worked closely with past Treasurers and Presidents and it was always more than a job to Linda. She was an integral part of the society and took great delight in corresponding with members and solving their problems. And she did so with a smile and genuine sense of caring. We probably won't have a full appreciation for all of the tasks that Linda undertook until she is no longer doing them! Luckily, for the past 17 years, Noreen Favreau has carried out a number of various tasks, assisted with meeting organization, web page activities, corresponded with members, ably assisted LeRoy Creswell with preparation of the *Quarterly Newsletter*, and worked closely with Linda – so she knows NSA well. Noreen has officially assumed the position of Secretariat, so you know where to write if you have any queries.

So a very fond farewell to Linda with our gratitude for so many years of loyal service. We wish her every joy in her retirement – enjoying the Florida sunshine with her housemates, Romeo and Dante.

Happy sailing, Linda!
Warmest wishes from all your friends at the NSA

Linda – Best wishes and thanks so much for all your help over the years!
Dave Bushek

It is hard to imagine that you have been with NSA for so long. I have just assumed you would be with us forever doing your work behind the scenes and supporting all the rest of us and the organization. Your thoroughness and thoughtfulness will be greatly missed. That said: ENJOY YOUR RETIREMENT!
John Kraeuter

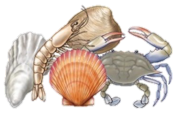
Linda – Happy re-retirement! I am glad you are doing well and enjoying life. I believe I was one of the first NSA Treasurers to work with you and I certainly enjoyed doing so. You definitely made the job easier and kept me from stressing too much about the accounts.
Evan Ward

Best wishes to you on your retirement, Linda. Your professionalism and service over the years, as well as your generosity and warmth, are greatly appreciated.
Stephen Tettelbach

I was so lucky to have Linda's steady and deep knowledge when I stepped into the role of NSA Treasurer. I may be getting too old to remember when that was, but I'll never forget how Linda's pleasant and diligent assistance softened the pain of that role.
Dee Kreeger

I've worked with Linda for the past seven years as part of the Journal of Shellfish Research *subscriber services team. She consistently is a treat to speak with, and always brightens my day when our paths cross. While she's always professional, she is also energetic, enthusiastic, and ready with a story that'll make you smile (regardless of how busy she may be). She'll definitely be missed once she starts her new, and very well-deserved, adventure. I wish her the very best in her retirement!!*
Carly Truitt

Sheridan congratulates NSA Secretariat, Linda Kallansrude, on her many exemplary years with the NSA and a well-earned retirement! As another long-time member of the NSA family, Sheridan has always been proud to serve the organization, and equally grateful for friendships like Linda's. Bravo, Linda! All the best, and enjoy! You'll be missed!
Your friends at Sheridan



Recruits' Corner

Fellow Recruits,

Hope you are all geared and ready up for the 2021 virtual National Shellfisheries Annual Meeting (March 22-25, 2021). We are looking forward to hearing about your recent research, watching your presentations, and meeting you virtually at NSA 2021!

There will be several student events at this year's meeting. Keep your schedules open for a beginning of conference student orientation, non-academic jobs panel, and Recruits happy hour, as well as the usual line up of inspiring plenary talks, fascinating sessions, and trade show.

We will also be organizing a Student-Mentor virtual meet up that will take place throughout the meeting. This event will pair students with professionals from government, the private sector, and academic institutions for informal meetings. The goal is to facilitate networking opportunities at the virtual conference and provide a platform for mentors and students to share and learn. Students and Mentors will be placed in contact with each other and choose a time that works for both parties to meet over breakfast, an afternoon coffee, or evening beverage.

Stay in the loop by following the Student Recruits page on the NSA website (https://www.shellfish.org/student-members), the NSA Student Facebook page (https://www.facebook.com/groups/2216454881732029), and NSA on Instagram (@nationalshellfisheries). We would love to showcase student research, so please send us photos of your research with a short blurb.

Please email Hannah (hannah.i.collins@uconn.edu) or Alex (armarquardt@vims.edu) if you have any ideas or concerns.

Hannah and Alex

Coming Spring 2021
NSA Membership Roster

Review your NSA member profile to make sure it is up-to-date

www.shellfish.org

You can now add your orcid ID - (under 'My Profile')

Questions: contact the NSA Secretariat secretariat@shellfish.org

A New Name for an Old Pathogen: Introducing Mucochytrium quahogii, *formerly QPX* (= *Quahog Parasite Unknown*)

Quahog Parasite Unknown (QPX), a facultative parasite of the northern quahog (=hard clam), *Mercenaria mercenaria*, has been credited with causing numerous mass mortality events, leading to the closure of fisheries and millions of dollars in losses. Although QPX has been observed in clams since the 1960s and cultivated since the 1990s, conflicting reports on important aspects of its biology have prevented its formal description and assignment of a taxonomic name. 18S rRNA gene sequences identify QPX as a thraustochytrid, a group of the Labyrinthulomycetes (Stramenopiles), but its production of copious mucus is atypical for this group. There are also conflicting reports about whether QPX shares common features of thraustochytrids, such as the production of biflagellate zoospores as well as the presence of the unique organelle, the bothrosome, which unites the labyrinthulomycetes and produces an ectoplasmic net.

Recently published in *Protist*, "Erection of a new genus and species for the pathogen of hard clams 'Quahog Parasite Unknown' (QPX): *Mucochytrium quahogii* gen. nov., sp. nov.", builds upon the previous descriptions of QPX in culture and provide ample evidence for the production of zoospores, completing the missing piece of the QPX life cycle. The challenge of detecting zoospores in QPX arose because in culture zoospores are only produced after manipulation by washing thalli (vegetative cells) and sporangia free of their mucus (demucusing). Zoospores were observed in multiple strains from several geographic locations, including strains that were isolated over 20 years ago, in addition to newly-isolated strains.

Close observation by time-lapse video microscopy revealed a more complex life cycle than previously recognized and insight into conditions under which different life stages are produced. The article describes new cell types not previously reported, and present a new perspective on the QPX life cycle, including a secondary replication pathway with multipolar budding (successive cell divisions), production of endospores, non-motile spores and motile zoospores, along with cyst and protoplast stages.

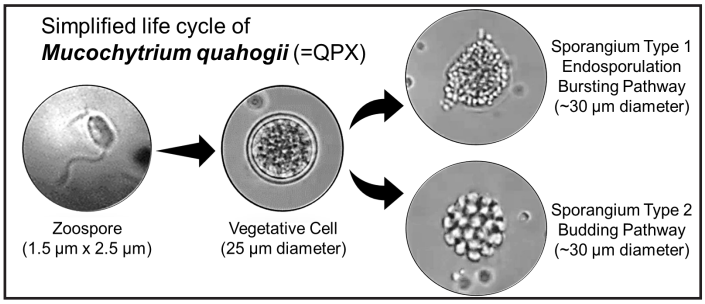


Figure Credit: Sabrina Geraci-Yee and Christopher J. Brianik.

As the mechanism of natural QPX disease transmission in hard clams remains elusive, this study opens new avenues into understanding disease pathogenesis and dynamics by investigating how these new life stages influence interactions between QPX and the hard clam. Finally, a formal species description and erection of *Mucochytrium quahogii* gen. nov., sp. nov. is provided to accommodate this unusual thraustochytrid.

For more information: Geraci-Y., S., Brianik, C.J., Rubin, E., Collier, J.L., and Allam, B. 2021. Erection of a new genus and species for the pathogen of hard clams 'Quahog Parasite Unknown' (QPX): *Mucochytrium quahogii* gen. nov., sp. nov. *Protist*, DOI: 10.1016/j.protis.2021.125793

Clams to the Rescue

A New Jersey project recruits local students to grow shellfish

The back bay area is located behind the New Jersey barrier islands of Monmouth, Ocean, Atlantic, and Cape May Counties and includes the set of interconnected water bodies and coastal lakes that are separated from the Atlantic Ocean. The back bay islands offer protection against flooding and storm-driven waves, but erosion is slowly shrinking those islands. Since the 1930s, the back bay islands have reduced in size by more than 400 acres, based on estimates from historic photographs.

Junetta Dix, Director of Environmental Services for ACT Engineers, along with Ocean City New Jersey, ReClam the Bay (a non-profit environmental organization) and Ocean City High School collaborated on a project that reconstructed Shooting Island, a marshy island where material dredged from the back bay was used to restore it to its former size. This project was completed in 2019 and included a rock wall along the west side of the island and habitat for invertebrates, like the juvenile clams, along the south. Shellfish will find their way to the area naturally, but introducing shellfish will greatly speed the process.

Juvenile clams in the upweller. Photo credit: Local Shore Magazine.

This project also included the installation and operation of a shellfish upweller at the Bayside Center. Ribbed mussels grown in the upweller will be placed at the previously established 'oyster castles' and along the western edge of Shooting Island near the rock sill.

"But it doesn't stop there," Dix said. "They could be used on any shoreline restoration project up and down the entire coast. We will grow them here and take them out to any eroding shoreline." She added that shellfish will serve to help clean and improve the bay water.

Some of that work will fall to students from Ocean City High School. Dix said she worked with school superintendent, Kathleen Taylor, and Science teacher, Michael Pomatto, who teaches marine and environmental sciences. The maintenance of the system will be incorporated into the curriculum. Students from AP Environmental Science, Advanced Oceanography, and the Marine Science Club at the high school will participate in the project.

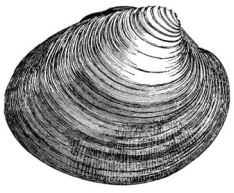
"We hope to use the upweller to grow ribbed mussels and oysters to use for restoration projects, but more importantly, for the education of our children, our residents, and our visitors to Ocean City," Dix said.

Ribbon cutting at the Bayside Center. Photo credit: Local Shore Magazine.

Science teacher, Keith Zammit said the project "could have extensive opportunities for students, including in Chemistry classes, Biology, and more. Students can learn about the ecosystem of the bay, the impact of runoff from lawn fertilizers and other sources and how the bay islands interact with the species that live in the back bays."

The Ocean City High School also has a project to grow algae for aquaculture.

For more information on this restoration project: http://www.njcwrp.org/shooting-island



Abstracted from: Local Shore Magazine, October 29, 2020.

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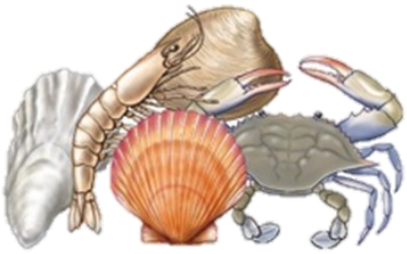

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www.shellfish.org

Upcoming Events

Aquaculture Europe 2021: Apr. 12-15, 2021. Cork, Ireland. For more information: www.aquaeas.org

20th International Conference on Shellfish Restoration: Apr. 27-30, 2021. Nelson Bay, NSW Australia. For more information: https://willorganise.eventsair.com/2020-international-conference-on-shellfish-restoration/

American Malacological Society 2021: Jun. 14-18, 2021. Nova Scotia, Canada. For more information: https://ams.wildapricot.org/AMS-2021

Aquaculture America 2021: Aug. 11-14, 2021. San Antonio, TX. For more information: www.was.org

Physiomar 2021: Sept. 7-10, 2021. Nelson, New Zealand. For more information: https://confer.eventsair.com/physiomar-2020/

Aquaculture Canada/WAS North America 2021: Sept. 26-29, 2021. St. John's, Newfoundland, Canada. For more information: www.was.org

Global Conference on Aquaculture Millennium +20: Sept. 22-27, 2021. Shanghai, China. For more information: https://aquaculture2020.org/registration/

Aquaculture Europe 2021: Oct. 5-8, 2021. Funchal, Madeira, Portugal. For more information: www.aquaeas.org

23rd International Pectinid Workshop: Apr. 20-26, 2022. Douglas, Isle of Man. For more information: www.internationalpectinidworkshop.org

Aquaculture 2022: Feb. 27-Mar 3, 2022. San Diego, CA. For more information: www.was.org

Aquaculture America 2023: Feb. 19-22, 2023. New Orleans, Louisiana. For more information: www.was.org

If you would like to announce a meeting, conference, workshop, or publication that might be of interest to NSA members, please contact the Interim *QNL* Editor, Steven Allen (sallen@bowdoin.edu).