

Upcoming Events

Aquaculture Canada/WAS North America 2022: Aug. 15-18, 2022. St. John's, Newfoundland, Canada. For more information: www.was.org

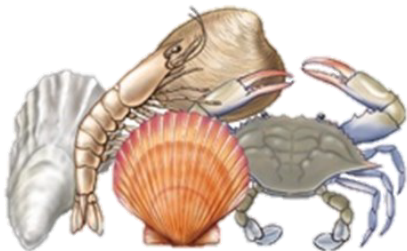
Aquaculture America 2023: Feb. 19-22, 2023. New Orleans, Louisiana. For more information: www.was.org

115th NSA Annual Meeting: TBD 2023. Baltimore, Maryland. For more information: www.shellfish.org

23rd International Pectinid Workshop: Apr. 19-25, 2023. Douglas, Isle of Man. For more information: www.internationalpectinidworkshop.org

116th NSA Annual Meeting: Mar. 22-26, 2024. Charlotte, North Carolina. For more information: www.shellfish.org

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, Steven Allen (sallen@bowdoin.edu).



President's Message



Back home from the Triennial Meeting and time to see if our old lawnmower will start and provide one more year of service. I had a fine time in San Diego; we are all in debt to the organizers and program committee. The fifties kitsch of the meeting venue was interesting—the giant neon swimmer over the Lapper restaurant was the coolest. Once I located the Häagen-Dazs store in the mall next door, I was a thoroughly happy camper. It was great to talk to people face to face, catching up with old friends and making some new ones. The menace of Covid is still with us, as evidenced by some missing speakers and posters, but this meeting felt like things are more or less back to normal. I enjoyed looking at the posters and sat through some talks. I learned some new facts. For example, that Olympia oysters switch sex every year. As a physiologist, this raises questions in my mind about the endocrinology involved—genes for enzymes in the biochemical pathways that produce estrogens and testosterone being switched on and off in synchrony and in rhythm—and how all of this is controlled by the simple nervous system of an oyster. That is what science is all about, framing the next question. I hope all of you had a successful meeting and are looking forward to Baltimore next year.

I spent some time at our booth, and would like to thank all of the student volunteers for helping out. Business was very good. We sold out of t-shirts and hats, and the student endowment auction was also a success. While I am handing out thanks, I want to include outgoing, continuing, and incoming officers and members of the NSA Committees for their service. These are the people that keep the NSA moving forward.

At the Executive Committee meeting, the establishment of a new student grant in honor of Leroy Creswell, who was a fixture at past meetings and a great ambassador for all things shellfish, was unanimously approved. The award is described in more detail elsewhere in this newsletter. Once more, I would encourage eligible students to apply for this new award as well as the Castagna, Carriker, and Abbe grants sponsored by the Association.

Finally, as someone who has personal experience with war, I stand with the people of Ukraine fighting for the freedoms we take for granted.

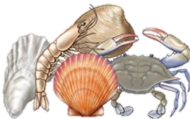
Lewis Deaton, *President*

SAVE THE DATES

115th NSA Annual Meeting
TBD 2023
Baltimore, Maryland

116th NSA Annual Meeting
March 22nd–26th, 2024
Charlotte, North Carolina

117th NSA Annual Meeting (Triennial)
To Be Determined



In this issue:

- NSA Student Awards Announced
- Carriker Student Research Grant Update
- Pacific Oysters: Persuading the British Government
- Book Review: Diseases and Parasites of the Eastern Oyster *Crassostrea virginica* in Chesapeake Bay: An Illustrated Reference Guide

Pacific Oysters: Time for Britain to Move Forward

In response to the decline of the native oyster (*Ostrea edulis*), the UK government approved introductions of the non-native Pacific oyster, *Crassostrea (Magallana) gigas*, for aquaculture and in 1982 issued a General Licence to “release” them. It was thought that, although hatchery juveniles would grow well, temperatures were insufficient for successful naturalisation; however warming seas have enabled wild populations to become established in southern Britain.

Other European countries value the Pacific oyster (Figure 1), recognising it as naturally resident. In Britain, despite the “General Licence”, it is paradoxically classified as an invasive non-native species and aquaculture growth has stalled. After years of prevarication, we call on the UK government to develop a consistent and settled policy position. Here are five good reasons why:

1) Sustainable low carbon protein: With the plateauing of wild fishery production, the main contribution to additional high quality protein food production should be by non-artificially fed aquaculture species, a category in which the Pacific oyster is pre-eminent.

2) Habitat: In optimal conditions, wild Pacific oysters can form biogenic reefs covering underlying sediment. Comparisons of reef, cleared reef, and mudflat indicate that oyster reefs score highest in terms of both species richness and biomass. Modelling suggests that a mosaic of these three area types is the optimal conservation strategy.

3) The decline of the native: Despite restoration attempts, the native oyster is unlikely to return to its previous abundance, as disease and warming are factors in its decline. Consequently, indigenous ecosystems are left functionally degraded and open to genuinely invasive species such as the slipper limpet (*Crepidula fornicata*). The native oyster can no longer offer the trophic benefits or ecosystem services that it once did. The Pacific oyster provides equivalent benefits.

4) Cleaner water, coastal defence: Pacific oysters provide a range of ecosystem regulating and provisioning services. These include mitigation of water quality issues such as eutrophication and particulates. Nitrates, for example, are assimilated into phytoplankton and then oyster tissue, which is then removed at harvest.

5) They are here to stay: Gradual and continued northerly range expansion is consistently predicted by independent modelling studies. Using IPCC climate predictions, hydrodynamic modelling and habitat mapping, range expansion in southern England is predicted. Management modelling also indicates that the Pacific oyster is here to stay.

So, what is the problem? As sea temperature rises, the distribution of temperate species is already shifting poleward. This leaves indigenous ecosystems degraded unless new species replace them. Outdated environmental policies, reinforced by anachronistic conservation thinking, are counter-productive. New paradigms of conservation are needed. Yet despite improved scientific understanding, “non-native” and “invasive” are still frequently used as synonyms, and non-natives are distinguished on whether they arrived “naturally” or anthropogenically. Such deficits in terminology and thought are counter-productive: conservation resources can be wasted and legitimate opportunities for coastal communities lost. In Britain as elsewhere, we must learn to love the Pacific oyster.

Acknowledgment. This article is an edited version of Humphreys et al. (2021) and consists of extracts from Syvret et al. (2021). The Shellfish Association of Great Britain and authors would like to express their appreciation for support provided by The Fishmongers’ Company’s Fisheries Charitable Trust, London.

Further Reading:

Humphreys, J., Herbert, R.J.H., Roberts, C., and Fletcher, S. (2014). A reappraisal of the history and economics of the Pacific Oyster in Britain. *Aquaculture*, 428-429: 117-124.

Humphreys, J., Syvret, M., Horsfall, S., Williams, C., Woolmer, A., and Adamson, E. (2021). Why we should learn to love Pacific oysters. *The Marine Biologist*, Issue 20, October. Plymouth: The Marine Biological Association of the UK: pp. 10-11.

Herbert, R.J.H., Humphreys, J., Robert, C., Fletcher, S. and Crowe, T. (2016). Ecological impacts of non-native Pacific oysters (*Crassostrea gigas*) and management measures for protected areas in Europe. *Biodiversity and Conservation*, 25: 2835-2865.

Syvret, M., Horsfall, S., Humphreys, J., Williams, C., Woolmer, A., and Adamson, E. (2021). *The Pacific Oyster: Why we should love them*. Prepared for the Shellfish Association of Great Britain, London: 23 p. DOI: 10.13140/RG.2.2.22441.72806

John Humphreys, Bournemouth University

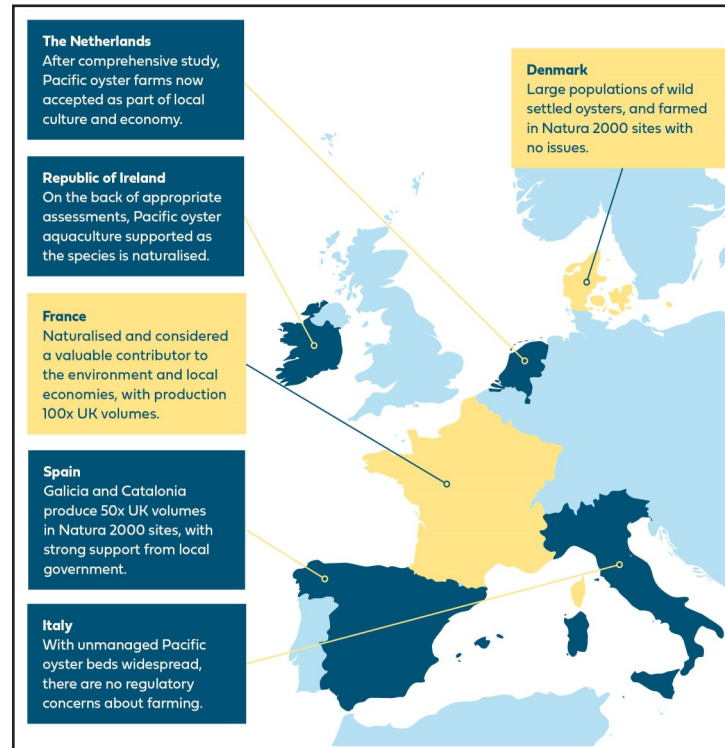
Martin Syvret, Mem.MBA

Sarah Horsfall, Shellfish Association of Great Britain

Christian Williams, New Economics Foundation

Andrew Woolmer, Salacia Marine

Eleanor Adamson, Fishmongers’ Company’s Fisheries Charitable Trust



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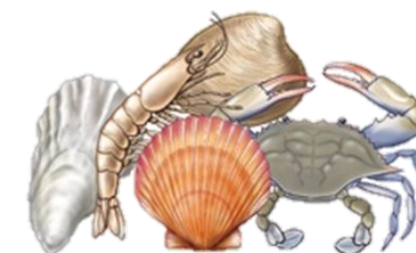
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Treasurer's Report (FY 2021)



The most recent completed fiscal year (FY) for NSA was from October 1, 2020 through September 30, 2021, which encompassed the virtual meeting held in March 2021. Revenues and expenses were \$334,191.80 and \$288,477.00, respectively, which resulted in a net gain of \$45,714.80. Total end of FY assets were \$606,530.76, which included \$153,246.07 in the Student Endowment Fund. We still maintain assets above the prior 10-yr average annual expenses of \$291,101.04, which the Executive Committee recommends for maintaining association security for unanticipated events. Thank you to those that contributed to the Student Endowment Fund and the very successful online auction as part of the virtual meeting.

Jay Parsons
Treasurer

The Recruits Celebrated 30 Years



Jay Parsons (original Recruits co-chair), Sandy Shumway (Recruits founder), Hannah Collins and Alexandria Marquardt (current Recruits co-chairs). Below: David Bushek (original Recruits co-chair) and Hannah Collins. Missing from photo: original co-chairs, Maureen Krause (current Member-at-Large) and Greg Shatkin (deceased).



2022 NSA Resolutions

Each year, the National Shellfisheries Association recognizes individuals for special contributions to the society in the form of Resolutions. Each begins with the same introduction:

Whereas, the National Shellfisheries Association, Inc. (NSA) is a Not-for Profit Corporation, and Whereas, members serve as officers and committee members on a voluntary basis, Be It Resolved that on the 5th of March, 2022, the National Shellfisheries Association formally recognizes and thanks.

This year, the following Resolutions were presented.

- **Susan Skomal**, President and Chief Executive Officer BioOne: for her outstanding leadership of the non-profit publisher BioOne, which has been a major contributor to the expansion of the online reach and readership of the *Journal of Shellfish Research* over the last 16 years. Her contributions to the success of the *Journal*, the National Shellfisheries Association, and scientific publication globally are gratefully acknowledged and appreciated. The NSA wishes her a long and rewarding retirement.
- **John and Noah Cooksey**: for their continuing efforts to highlight the aquaculture and shellfish industries through their tireless and outstanding efforts in conference management, as advocates for the field -- and especially for their friendly approach to organized chaos!
- **Acacia Alcivar-Warren** and the **FUCOBI Foundation**: for their continued efforts to encourage and support scientific research and promote diversity through membership and student engagement in the National Shellfisheries Association.

WANTED: REVIEWERS

Reviewers are always needed for the *Journal of Shellfish Research* and it is an ever-increasing task to get folks to help. If you are willing to review papers for the JSR, please contact the Editor.

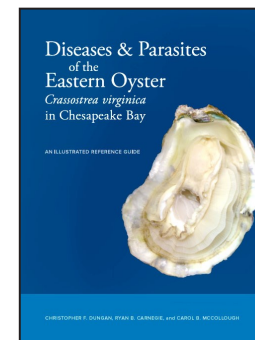
A big thank you all who have helped during 2021, and a special thanks to those who went above and beyond to provide reviews:

BRIAN BEAL
XIMING GUO
STEVE GEIGER
ANDREW JEFFS
JOHN KRAEUTER
PAUL SOUTHGATE



Book Review: *Diseases and Parasites of the Eastern Oyster Crassostrea virginica in Chesapeake Bay: An Illustrated Reference Guide*

Christopher F., Dungan, Ryan B. Carnegie, and Carol B. McCollough. 2020. UM-SG-TS-2020-01. Maryland Sea Grant. USD \$34.95. 126 pp.



This is an outstanding book, serving as a unique and obligate reference guide for histological diagnosis of diseases and parasites of the eastern oyster. The book contains high quality, well selected, informative micrographs along with appropriate information and explanations for diagnostic purposes. There are 124 color micrographs of histological sections, most of them corresponding to hematoxylin and eosin-stained sections, a very generous number for a book of 110 pages. An introductory chapter with non-exhaustive, useful information on the oyster histological microanatomy, focused on organs appearing in the histological sections of soft tissue pieces that are excised according to the recommended orientation for histological diagnosis (mantle, gills, digestive system, gonad, and circulatory system). It is followed by a section on diseases caused by protists, including chapters on *Perkinsus marinus*, *Haplosporidium nelsoni*, *Haplosporidium costale*, *Bonamia exitiosa*, ciliates, Diplomonad flagellates, and Apicomplexa. There is another section on diseases caused by metazoans, including chapters on nematodes, trematodes, cestodes, *Turbellaria* and crustaceans, a section covering bacterial diseases and viruses, a chapter on viral gametocytic hypertrophy, and a chapter on bacteria. Also included is a section on proliferative disorders, with chapters on disseminated neoplasia and germinomas plus other solid tumors. A section on "others" with a single chapter on less-known pathogens, including acantocephalans, microsporidians, gregarine-like protists, digestive gland basophil-sphere cells, amoeba-like parasites, labyrinthulid-like protists, and haplosporidian hyperparasites follows. There is a final reference section. Each chapter on diseases and parasites repeats the structure, consisting of a subsection of background and geographic distribution, another of epizootiology, and a final subsection on histological presentation. Consistent with the purpose of this guide, the subsections on histological presentation are the most exhaustive, providing thorough information on the histological features of parasites, host reaction, general host tissue appearance and clues for appropriate diagnosis. The epizootiological information is mostly focused on prevalence and modulation of disease dynamics by environmental factors, particularly temperature and salinity, how they influence spatial and temporal disease trends, as well as limiting environmental values, emphasizing knowledge derived from and applied to Chesapeake Bay.

Even with the great quality of this guide, some minor issues should be mentioned. The acronym RLO corresponding to "rickettsia-like organisms" is still used in spite of the fact that most intracytoplasmic bacterial microcolonies from bivalves correspond to bacteria other than rickettsiae. The etiology of disseminated neoplasia in *Crassostrea virginica* is yet unknown; however, a clear reference to the well-known natural horizontal transmission of clonal cancer cells between individuals of the same species, and even between different species, in the case of disseminated neoplasia of some bivalve species other than oysters is lacking. There is no mention of cases of occurrence of hydrozoans in the mantle cavity of eastern oysters (Tolley *et al.*, 2010) in the section on diseases, or conditions caused by metazoans.

This guide is a brilliant and welcome addition to the literature and addresses the increased need for a broader understanding of oyster health, as well as for diagnostic services associated to the expanding activity in eastern oyster aquaculture and restoration.

Antonio Villalba

Tolley, S.G., Evans III, J.T., Burghart, S.E., Winstead, J.T., and Volety, A.K. 2010. Role of freshwater inflow and salinity on population regulation in the hydrozoan inquiline symbiont *Eutima* sp. *Bulletin of Marine Science*, 86(3): 625-636.

NEW PAID LIFE MEMBER OPTION

Thank you
Dianna Padilla &
Carol McCollough

Log-in to renew and update your membership status, mailing preferences, or areas of interest/research (www.shellfish.org)
Contact the Secretariat with any questions (secretariat@shellfish.org)

JSR Article Featured in BioOne Vista

The Case of the 'Missing' Arctic Bivalves and the Walrus: The Biggest [Overlooked] Clam Fishery on the Planet by Mann *et al* (2020) (<https://doi.org/10.2983/035.039.0301>) is featured in the March 2022 *BioOne Vista* – a monthly collection of recently published articles highlighting timely subjects and themes in the biological, ecological, and environmental sciences. Explore the [March 2022 edition of BioOne Vista](#) and download the article.

Did you know that downloading articles like this and others of the JSR from BioOne helps to support the NSA? Royalties collected by downloaded articles help to offset about 50% of the operating costs for *Journal* production. Share your research with your colleagues and USE BIOONE OFTEN.



2021 Melbourne Carriker Student Research Grant Update

Awardee: Tyler Griffin
University of Connecticut

“Taxonomic diversity and functional recovery dynamics in the gut microbiome of blue mussels (Mytilus edulis) after experimental perturbation with antibiotics”

All animals (including shellfish) have evolved within the context of interactions with prokaryotes; intimate and specific ecological interactions with consortia of microbes living on and within animal tissues are ubiquitous. Bivalves are often dominant members of the macrobenthos in near-shore water and provide numerous ecosystem services. The blue mussel (*Mytilus edulis*) is a particularly common species along the coasts of the northeastern US with large ecological and economic impact. Broadly, my research involves characterizing the taxonomic diversity and function of the gut microbiota in *M. edulis* and investigating the responses of those communities to experimental disturbances.

The scope of the project supported by the Carriker Grant was to evaluate how the gut microbiome of *M. edulis* would respond after an experimental perturbation with antibiotics. A pilot study had previously demonstrated that the gut microbiome of the mussel could be significantly and reproducibly disturbed with a 3-week laboratory exposure to a mixture of antibiotics. After treatment, mussels had a significantly altered gut taxonomic composition and could be used in subsequent experiments. The antibiotics also significantly reduced bacterial abundance and species richness. Given these results, the next step was to evaluate how those microbial communities would respond when their hosts were placed back into the natural environment, which is a microbially-rich seawater medium. It was hypothesized that the communities would recover to a pre-disturbance state, thereby exhibiting resiliency.



In addition to monitoring the microbial communities, aspects of host physiology, namely absorption efficiency (AE) and soft-tissue glycogen content, during the microbial perturbation and recovery processes, were also tracked. If the experimental perturbation and diminishment of the gut microbiome were to impact either AE or glycogen content, it would serve as evidence that gut microbes participate in the digestive processes of

mussels. Further, if AE or glycogen were impacted by the perturbation, then it would be very interesting to know how they would respond if the host were returned to the natural environment and, hypothetically, re-populated with the natural consortia of microbes.

The experiment was conducted during June and July of 2021. Fifty-six mussels were collected simultaneously from Long Island Sound on the docks at the UConn Avery Point campus. Eight mussels serving as pre-disturbance controls were immediately sacrificed. All mussels in this study were dissected for 1) sampling total genomic DNA from stomach and digestive gland tissues; 2) measuring AE; and 3) assessing glycogen content. The remaining 48 mussels were either exposed to antibiotics or held in identical laboratory conditions without antibiotics (laboratory control mussels). Mussels were housed in microcosm chambers filled with 1 L of filtered, autoclaved, and aerated seawater. Sterile seawater was changed daily, and mussels were fed daily at regular intervals with a boiled mixture of live and cryopreserved phytoplankton. Thirty-two mussels were given two daily doses of an antibiotic cocktail consisting of streptomycin, ciprofloxacin, and cefotaxime; 16 laboratory control mussels did not receive antibiotics but were otherwise treated the same. After three weeks of antibiotics dosing, eight antibiotic-exposed and eight laboratory control mussels were sacrificed to serve as immediate post-disturbance animals. The remaining 32 mussels were transferred back to the natural environment in Long Island Sound by suspending them in nets off the Avery Point docks for either one, three, or ten days. At each time point, eight post-antibiotic disturbance mussels were sacrificed. The eight remaining laboratory control mussels were sacrificed only after ten days; these animals served as a control for the processes of handling and laboratory husbandry and provided an additional comparison for insight into recovery dynamics. Altogether, this design allowed the tracking of potential recolonization and successional processes through time.

At present, the microbial community DNA and mussel AE analyses are not completed; however, preliminary analysis of the glycogen data was recently achieved. For all mussels sacrificed in this experiment, soft tissues were collected and homogenized and used in a commercially available glycogen content assay kit. The kit involved a colorimetric assay measured on a microplate reader. Initial results suggest that there is no significant difference in glycogen content amongst the treatment groups. This implies that microbial perturbation with antibiotics, and subsequent return to the natural environment, did not impact energy storage in the mussels. It is possible that the gut microbiota of *M. edulis* simply do not influence the physiological process of glycogen storage. Alternatively, the length of the perturbation may not have been sufficient to affect glycogen content. As such, the results from the AE analysis will be informative because AE is considered to be a much more sensitive parameter of digestive physiology than glycogen content. The funds generously awarded by the NSA have been critical for purchasing kits and reagents and will continue to be used on sequencing expenses. I am looking forward to completing these analyses and asking new questions based upon the insights they provide.



2022 NSA Student Presentation Awards

San Diego, California served as a delightful host for our triennial gathering of the American Fisheries Society Fish Culture Section, World Aquaculture Society, and National Shellfisheries Association. We heard many comments on how good it felt to reconnect with colleagues and friends in person after what had been several years in many cases. The Town and Country Resort provided a highly conducive atmosphere complete with outdoor areas in which to enjoy the California sunshine.

In advance of the meeting, the Student Endowment Fund Committee (SEF) and Recruits Co-Chairs encouraged student members to apply for registration and accommodation waivers through the SEF travel award lottery system and resulted in only seven applicants! All seven received an award (4 registration and 3 accommodation waivers). The lottery application deadline was extended for two weeks and an additional 22 applications were received. In total, the SEF was able to offer assistance to 12 of the 29 applicants (~41%), comprising four registration waivers and eight accommodation waivers (4 shared rooms). Students interested in attending the 115th Annual Meeting in Baltimore, MD March 21st-25th 2023 are **strongly encouraged to apply**... your advisors/mentors will thank you for saving their projects money and it looks great on your resume that you have been proactive in helping to pay your way to attend professional meetings to present your research.

Overall NSA-student attendance was lower than is usual, and a total of 17 oral presentations were eligible for the Nelson Award and 7 posters eligible for the Gunter Award (although three posters were ‘no shows’). Nevertheless, the SEF is grateful to everyone who contributed their time, energy, and expertise to both the presentation competitions and the judging process. The SEF is delighted to announce the following results:



The Thurlow C. Nelson Outstanding Oral Presentation Award was awarded to Alexandria Marquardt, Virginia Institute for Marine Science, for her presentation: “Distribution and demographics of fossil oysters on the Atlantic continental shelf.”

The Gordon Gunter Outstanding Poster Presentation Award was awarded to Anna Poslednik, Virginia Institute for Marine Science, for her presentation: “Insight into interactions between the major oyster pathogens *Haplosporidium nelsoni* and *Perkinsus marinus* from long-term disease diagnostic data from Virginia.”



Many congratulations to Alex and Anna who will receive two years of NSA membership, a certificate of accomplishment, as well as a great résumé builder marking this achievement!

The SEF Committee hopes that the meeting in Baltimore next spring will see us back to high numbers of student participants and fierce competitions in both the talk and poster categories. We will be looking to recruit lots of judges, so be on the lookout for those calls, and please volunteer!

Peter Kingsley-Smith
Melissa Southworth
Student Endowment Fund Committee

Shells Tell the Story of Long-gone Button Industry

By: Marisa Sloan, Medill Reports, Northwestern University

Throughout the 19th and early 20th centuries, mother-of-pearl buttons — cut out of shells left behind by marine snails and treated in chemical baths — were popular for their strength and attractive sheen. Archaeologists of the Environmental Archaeology Laboratory of the Smithsonian Environmental Research Center (SERC) are interested in uncovering how the button industry impacted the local ecosystem and shaped the lives of the community that hosted it.

At SERC, Jim Gibb and his team of citizen scientists are sifting through trays of broken cone top shells excavated from the waste piles of a button factory in the small community of Denton, Maryland. The Denton factory, called simply “the button factory” by residents, was constructed in 1933 and transformed shells into buttons until its closure in 1996.



Top to bottom: A mussel with holes from punched-out blanks; white abalone shells; red and white trochus; two finished buttons and five unfinished blanks. (Credit: Kristen Goodhue/SERC)

Surviving factory machinery provides clues to the button-making process. Workers first soaked shells to soften them and remove the smell of the sea, then drilled button-shaped “blanks” from the undersides using a lathe fitted with a tubular saw. Various other machines then sanded the ends of each finished blank to silky smoothness, sorted them by size and sliced them into uniform thickness.

Workers discarded trimmings of the process in the yard near the factory’s buildings, sometimes even using them to pave Denton’s parking lots and alleys or increase the fertility of agricultural soil. During their research, SERC scientists recovered shells imported from around the world: black abalone from the eastern Pacific Ocean, yellow sandshell from the Mississippi River and Gulf of Mexico, pearl oyster and cone top shell from the south Pacific, and toothed top shell from the Indian Ocean.

The findings hint at a local species unsuitable for button-making, complicating the question of shell sourcing and the role of the Denton community in the worldwide manufacturing network of the time.

The introduction of cheaper, plastic buttons drove most mother-of-pearl button shops out of business in the 1950s, as well as the popularity of bigger, brighter colored buttons in the psychedelic 1960s. “The last shop owner in Maryland was doing specialty work with Barbie dolls and sequined performance costumes for Elvis Presley,” Gibb said, referring to the Martinek plant on Elliott Island that closed in the 1990s.

If you want to follow in the fashionable footsteps of Barbie and the “King of Rock ‘n’ Roll,” look no further than Etsy, a popular online marketplace that specializes in handmade and vintage items. A simple search for mother-of-pearl buttons brings up over 9,000 results.

Recruits Corner

Fellow Recruits,

It was a pleasure meeting many of you in San Diego during our Triennial meeting. We hope you enjoyed the first opportunity to meet with your NSA peers in two years. It was a very busy week, with nightly events, concurrent sessions, trade show, and poster sessions. Many NSA students who attended presented poster and oral presentations, and it was wonderful to be able to hear about their exciting research.



Throughout the meeting, NSA students participated in a number of events organized by the Aquaculture 2022 Student Steering Committee. Sixteen NSA students joined the student field trip to the San Diego Zoo, sponsored by Jones Fish and the Triennial Committee, for a guided bus tour, talk with a zoo aquarist, and afternoon of exploring. NSA students also participated in a Mentor-Mentee Breakfast, sponsored by the Ohio Soybean Council, where they were matched with mentors from industry, academia, government, and the private sector based upon their shared interests and mentor expertise. At the Student Spotlight Presentations, NSA students Lydia Bienlien, Hannah Collins, and Kayla Mladinich presented their research in concise and insightful 4-minute presentations. Kayla Mladinich was awarded 3rd place and a cash prize of \$200. Throughout the conference, a number of student teams participated in the Student Scavenger Hunt, collecting stickers from student representatives and signatures from society board members and past presidents. Congratulations to the 1st, 2nd, and 3rd place teams who won gift cards provided by the Triennial Committee and sponsors Zeigler, Harrington, and Aquatic Equipment & Design, Inc. The student Discord channel was a hit, and allowed students to communicate throughout the week about interesting talks and sessions, student oriented events, and to coordinate opportunities for socializing in the San Diego sun.

A huge thank you to the student recruits who helped to staff the sales booth, sell raffle tickets, and run items at the NSA Auction. Students did a great job selling merchandise, including t-shirts, pewter and gold pins, hats, cookbooks, and much more.

We'd also like to give our congratulations to this year's student research award recipients. The student research grants provide \$1,250 for research funds and it is easy to apply; however, applications for these awards have been low in recent years. We highly encourage all students to apply for these grants. More information about the awards can be found on the NSA student members page (<https://www.shellfish.org/grants-and-awards>).

Finally, Alex Marquardt is stepping down from the position of Recruits Co-Chair. A massive thank you to Alex for her hard work over the past two years, and her enthusiasm for and commitment to the NSA. Fiona Boardman will be stepping into the co-chair role, so please join us in extending a warm welcome to Fiona! Fiona is pursuing her PhD at the University of Washington and will make a fantastic addition to the co-chair team.

As usual, email your Recruit Co-chairs Hannah (hannah.i.collins@uconn.edu) or Fiona (fcboard@uw.edu) with any questions, ideas, or concerns. Good luck with the end of the semester and summer research projects!

Hannah and Fiona



2022 NSA Student Research Awards

The Association has a number of competitive grants for students that provide \$1250 in support student research projects as well as for the Outstanding Student Paper published in the *JSR*.

This year the **Michael Castagna Award** for student research devoted to the area of applied shellfisheries was awarded to Tara Plee, University of Rhode Island, for her proposal entitled, "Determining key factors that prevent sustainable growth of the threatened green sea urchin industry".



The **Sandra E. Shumway Award for Outstanding Student Paper** published in the *Journal of Shellfish Research* has specific selection and evaluation criteria:



(1) The lead author must have been a student when the work was completed, (2) the paper must present the student's work, not that of a co-author, (3) it will be evaluated on the quality of science and writing, and (4) the importance of the work to the field of shellfish research. A panel of judges evaluated 23 papers, and the award was presented to Robin Fales for her manuscript:

Fales, R.J., Boardman, F.C., and Ruesink, J.L. 2020. Reciprocal interactions between bivalve molluscs and seagrass: A review and meta-analysis. *Journal of Shellfish Research*, 39 (3): 547-562.

Thank you, again, to all the students for submitting their proposals and for the reviewers for evaluating each these proposals and student papers so thoughtfully.

Application deadline is November 1, 2022.

Start planning now! Details are available at www.shellfish.org.

John Scarpa
Past-President

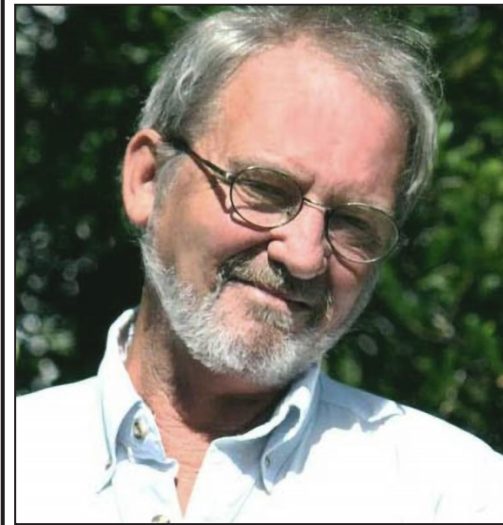
NSA Social Media Committee



The Social Media Committee regularly posts society updates, upcoming conferences and meetings, and general shellfish news from around the world.

This is great opportunity to share content with your colleagues. So please keep an eye out for pertinent stories and submit content ideas to Michael.Doall@stonybrook.edu.

Be sure to follow the latest NSA news, events, and publications on Instagram (@nationalshellfisheries) or Facebook (@shellfisheries).



NSA ANNOUNCES NEW STUDENT AWARD

R. LeRoy Creswell Award for Outreach and Extension
for promoting better understanding of shellfisheries issues in the public sector

The Association sponsors several grants-in-aid to student members to support their research efforts (e.g., the Carriker, Castagna, and Abbe Awards). This new award will recognize and support student merit in the following categories: recognition of an outstanding oral or poster presentation on outreach/extension at the annual NSA conference; support of outreach/extension costs incurred by a student; or recognition of an exceptional outcome by a student within the first year of their post-graduate work.

LeRoy was a long-time NSA member and a recipient of the David Wallace Award. LeRoy consistently supported his colleagues and employers to provide exemplary outreach and extension services at both the Harbor Branch Oceanographic Institute and at Florida Sea Grant. His door was always open to students and he took their aspirations to heart, helping many to progress in both academic and industry settings. He worked tirelessly to educate farmers and other shareholders to improve and expand the shellfish aquaculture enterprise.

Application deadline is November 1, 2022.



Become a Member of the Aquaculture Association of Canada

- AAC Watermark / Digital Conference Bulletins
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For more information, call (709) 631-3207 or email [Miranda Pryor \(info@aquacultureassociation.ca\)](mailto:Miranda.Pryor@aquacultureassociation.ca) or visit www.aquacultureassociation.ca

AAC is a registered charity with a mandate to transfer information between the various sectors of the aquaculture community. We organize workshops and conferences and support students through scholarships, travel bursaries, and other awards.



Find AAC on Facebook or Instagram.

NEW FAO Publication on Queen Conch Hatchery Techniques in Spanish



Davis, M., Cassar, V., Espinoza, R. y Lovatelli, A. 2021. Acuicultura del caracol rosado - Fases de crianza y vivero. Manual práctico. FAO Documento Técnico de Pesca y Acuicultura No. 676. Roma, FAO. <https://doi.org/10.4060/cb6663es>

The original manual (in English) was published in the *Journal of Shellfish Research*. <https://doi.org/10.2983/035.039.0319>

THE 114th ANNUAL MEETING

Aquaculture '22: 'Come one, come all, for aquaculture large and small' - and come they did!

The Triennial is now in the rearview mirror and it was a joy to see friends old and new - in person - at the newly-renovated Town and Country Resort in sunny San Diego! The meeting was a roaring success thanks to the Steering Committee (Mick Walsh, Michael Masser, Sandy Shumway, and Paul Zajicek) and the Program Committee (Jay Parsons and Sandy Shumway, co-chairs, Jim Tidwell, Steve Allen, and Jeff Heindel). The team of John and Noah Cooksey, Mario Stael, and George McKee did their usual amazing job of keeping things organized on all levels. The plenary speaker, Roz Naylor (Stanford), set the meeting in motion for almost 2000 participants representing 54 countries with 987 abstracts, 166 trade show booths, 114 posters, and 560 presentations in 79 sessions. Students made a strong showing with 223 attendees. The Student Organizing Committee (Hannah Collins, Alexandria Marquardt, Henry Fleener, Matthew Smith, Laura King, Adam Daw) did an outstanding job providing several special opportunities for engagement (see Recruits column, p. 8), and the auction was the usual raucous occasion and raised ~\$2100 for the Student Endowment Fund. Table sales and book raffles raised another \$1900.

It's now on to Baltimore for the 115th Annual Meeting. Watch for details (www.shellfish.org). See you there!

Sandy Shumway

