

National Shellfisheries Association Quarterly Newsletter



Est. 1908

2015 (3)

President's Message



Can Fall really be upon us? It seems that I just saw many of you at the 107th Annual Meeting in Monterey but that was a long six months ago. I hope that your Spring and Summer research/field seasons went well – and just to be clear, Summer in the northern hemi-

sphere isn't over until September 21. For our members and friends in the southern hemisphere I wish you well in your approaching Spring and Summer research/field experiences. As I write this column, my university is three weeks into a new academic year – new students, new courses, new proposals, new projects, new manuscripts - while Summer is my favorite season, the back-to-school season is certainly invigorating, both mentally and physically.

The concept of *new* has been in the news a lot recently. Some are asking 'is this the new normal' for areas that are experiencing changing water and weather conditions (drought/floods, rising sea level, changing weather patterns). Others are marveling at the report of a new reef discovered during the sea floor mapping of Wilson's Promontory National Park in Victoria, Australia; the new reef has been described as a biodiversity hot spot with remarkable invertebrate and fish assemblages. Events like these are what drive us to do what we love to do whether we work in industry, government, or academia: appreciate and explore the world around us.

The 108th Annual Meeting is fast approaching. NSA will meet in Las Vegas, Nevada, USA, from February 22-26, 2016 as part of the joint Triennial Meeting with the World Aquaculture Society, the Fish Culture Section of the American Fisheries Society, and the National Aquaculture Association. While the Triennial is much larger than our typical NSA meeting, there is indeed something for everyone. Our Triennial Program Representative, Steve Allen and Program co-Chair, Sandy Shumway, have things well in-hand for the NSA sessions. I am looking forward to seeing you in Las Vegas - you'll find me running between the NSA sessions, any presentations on shell formation, ocean acidification, biomaterials, the poster sessions, and the not-to-be-missed trade show. This is a tremendous opportuni-

ty for our student members to present their research and to meet and interact not only with NSA members, but also with people from supporting areas in the other associations. Which brings me to my last topic...

Deadlines are fast approaching for Student Travel Awards and Student Research Awards. **November 2, 2015** is the deadline to apply for the Student Travel Awards for the 108th Annual Meeting in Las Vegas. This is a great way to fund/cost-share your attendance at the meeting. All advisors are encouraged to share this information with their students; current student members will also be receiving e-mail communications from our student Recruits representatives. **November 30, 2015** is the deadline to apply for the Student Research Awards. These are awards named in honor of three NSA members who were exemplars in their respective research areas: The Carriker Grant for research in any area of shellfisheries, the Castagna Grant for applied shellfisheries research, and the Abbe Grant for research in the areas of crustacean biology and fisheries management. Don't miss this chance to compete for a grant to fund your research – it is a tremendous opportunity to demonstrate your grantsmanship and build your *curriculum vitae*. Go to www.shellfish.org/student-members for application information for all student funding opportunities.

See you in Las Vegas –

Karolyn Hansen
President

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Recruits' Corner

Hello Recruits!

Registration for the Triennial meeting in Las Vegas, NV is now open! Take a moment to visit the NSA website (shellfish.org) and see some of the early highlights of this meeting, including the tentative special sessions that are being planned. While the abstract deadline has already come and gone, there is still time to apply for Student Endowment Fund (SEF) travel awards and research grants. The deadline for TRAVEL AWARDS is **NOVEMBER 2ND**. This award is a competitive award, and can cover the cost of registration or hotel accommodations for students that are presenting a talk or a poster at the meeting. Only 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 are required to apply for the award. Remember, you can apply for an SEF Travel Award every year, even if you have previously won, and help defer the costs to attend the meeting. Since this year's meeting is a Triennial, we are also eligible to apply for travel grants offered by the World Aquaculture Society (WAS). In order to apply, you must become a member of WAS, which costs \$45 annually. WAS offers a variety of travel grants up to \$1,000 plus registration, so it is worth applying for sure!



We have been working in collaboration with the student representatives from the other organizations to make this Triennial a great one! The Triennial meeting is a little different from our annual meeting and allows us to broaden our professional networks beyond NSA. We are planning a student field trip at the beginning of the meeting to a seafood wholesaler as well as a behind-the-scenes tour of the Golden Nugget casino! We are also in the process of planning a student session during the meeting focused on careers in industry as well as a career fair. We are very excited about these student-focused additions to the program, and look forward to learning about opportunities outside academia. Make sure you bring lots of questions, and don't miss this opportunity to engage with scientists as well as industry members. Have someone you want to hear from at the panel or included in the career fair? Remember, you can e-mail us ideas and we'll look into having them addressed. As usual, there will be a student mixer directly before the NSA Auction which promises to be a good time! The exact dates of these activities will be announced soon, 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, please feel free to e-mail us.

As you all know, student volunteers are a big part of the meetings success and in the coming months we will be counting on your help. We hope the NSA recruits continue to make their presence felt and participate fully in this meeting. Keep an eye out for the call for student volunteers, which works a little differently at the Triennial meet-

ing. Our primary responsibility at the Triennial is to run the sales booth, but there will also be opportunities to help with registration and A/V for the technical sessions. Recruits are crucial in making sure these activities run smoothly and ensuring a successful meeting. It would not happen without your participation!

While not conference-related, we wanted to share information about RESEARCH GRANTS since we know students are always looking for creative ways to fund their research! The deadline for research grants is **NOVEMBER 30TH**. NSA offers three different grants-in-aid of research for students and each grant targets a different type of research. Grants are \$1250 and are designed to allow a student to purchase supplies and equipment essential to performance of their research. While it is not required for students to attend the annual conference to receive a research grant, students are encouraged to present work funded by NSA research grants at NSA conferences. Check out the Student Members section of the NSA website for more information on applying for research grants.

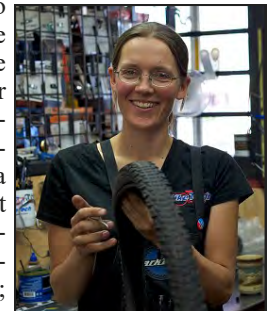
We hope to hear from you soon. As always, email us with any problems. If you are interested in getting involved for future meetings, the Student Recruits Chairs are always looking for students to help us with meetings and assisting fellow Recruits. If you are interested, please email Hillary (hlane@umces.edu) for more details.

*Looking forward to seeing you all
in Las Vegas!*

*Hillary Lane Glandon
Lillian Kuehl
Maria Rosa*

**NSA New Recruits Co-Chair Lillian Kuehl
Western Washington University, Bellingham, WA**

Lillian is an incoming Master's student, working in Deb Donovan's lab on restoration of pinto abalone (*Haliotis kamtschatkana*). Previously, Lillian worked in the shellfish industry at Taylor Shellfish in Quilcene, WA, and 4Cs Breeding Technologies at the Rutgers University Haskin Shellfish Research Lab in Bivalve, NJ. She received her undergraduate degree from Reed College, where she majored in Biology, and worked on a wide range of projects that led to her to her current passion for marine molluscs: in-house selective breeding of Pacific oysters for heterosis; restoration-grade Olympia oyster seed; induction of triploidy in geoducks; fabrication of a novel low-volume high-output larval rearing system; the occasional Manila clam spawn; flipping bags of oyster broodstock; and induction of polyploidy in eastern oysters.





Aquaculture 2016 **Las Vegas, Nevada** **February 22-26**

Aquaculture 2016 is just around the corner. On-line registration is open at www.was.org and Early Bird Registration closes January 11, 2016.

Book your rooms early at the PARIS, BALLY'S or PLANET HOLLYWOOD. The meeting will take place in the Paris Convention Center. Bally's is attached to Paris and Planet Hollywood is next to the Paris Hotel. You can reserve your room by phone or on their website. Check the conference web site for details

The program is packed, we are expecting to have over 100 sessions. The trade show is full and always a great opportunity to see new industrial developments, meet with publishers, and catch up with old friends at the coffee breaks and happy hours! The student representatives from NSA, WAS and the FCS-AFS have been working hard (see their report) and there will be plenty of opportunity for student participation and fun activities.

Yes, this is a big meeting, and yes, it is a different format and atmosphere than our regular meetings - but it's a great opportunity to meet other scientists, get a real sense of what the aquaculture industry is about, and learn a lot of new things! The abstract deadline has passed, but there is always room for more posters - and a poster means that your work is up and available for viewing and discussion throughout the entire conference. And, remember that the success of NSA at this conference depends on your participation.

***We look forward to seeing you in
 Las Vegas!***

We look forward to seeing you in Vegas!

Steve Allen
NSA Program Rep

Sandy Shumway and Jay Parsons
Program Co-Chairs

**Don't forget the
 24th Annual Auction**
**to benefit the
 STUDENT ENDOWMENT FUND**

**The success of the Auction depends on you.
 Even if you can't attend the meeting, you can
 still contribute your items and support the SEF.**

Send items ahead to Sandy Shumway (by January 31st at the latest) or give to a colleague who is attending.

**Books, trinkets, posters, shells, and old
 souvenirs – it's a great opportunity to clean
 out your closets.**

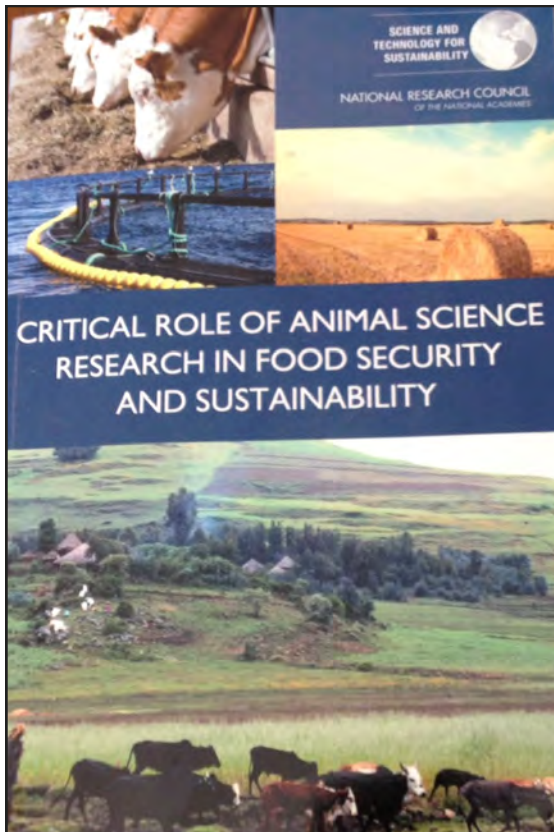
***Remember, nothing is too big or
 too small or too tacky!***



***Our celebrity auctioneer at the last
 Triennial conference in Nashville!***

National Research Council Report

On Sustainability and Food Security: Relevance to US and Global Aquaculture



A recent report (2015) published as the book titled *Critical Role of Animal Science Research in Food Security and Sustainability* by the National Academy Press offers research recommendations and associated priorities in an effort to meet future global demand for animal protein. The report arose from National Research Council's Committee on the Considerations for the Future of Animal Science Research on which I was selected to serve. The study was sponsored by the Association of American Veterinary Medical Colleges, Bill & Melinda Gates Foundation, Innovation Center for U.S. Dairy, National Cattlemen's Beef Association, National Pork Board, Tyson Foods Inc., U.S. Department of Agriculture, and U.S. Poultry and Egg Association.

The underlying assumptions on which the report is founded are "global animal protein consumption is increasing, restricted resources and climate change will drive agricultural resources, and rapid advances in biological sciences provide an opportunity to maximize the yield of investments in the animal science research and development". The goals of future research were based on three sustainability criteria "reducing animal agriculture's environmental footprint, reducing the financial cost per unit of animal protein produced", and placing added emphasis on societal determinants in the overall acceptance of what constitutes sustainable global animal agriculture. The report was composed of overarching (broad and high-end level) recommendations followed by specific US and global recommendations with complementary research priorities. Issues such as animal welfare, communication, and food loss/food waste characterized the call for a "reinvigoration" of ani-

mal science research. The content of the report has applicability to aquaculture research because aquaculture (culture fisheries) is animal agriculture.

Globally, the increase in production to meet increasing demand focused on the challenges that exist in parts of Asia and sub-Saharan Africa. Global population is now predicted to increase to 9.7 billion by 2050 (in the report, the committee used the figure 9.2 billion). Half of that surge will be concentrated in sub-Saharan Africa (Ethiopia, Nigeria, Tanzania, and Uganda). The remaining contributors will be the U.S. and Asia (India, Pakistan, and Indonesia). In fact, the estimated population of India (1.4 billion) will exceed that of China, and Nigeria will replace the US as the third most populous country in the world. Many of these Asian and African countries are designated as "most fragile" within the Fragile States Index (annually published in the journal *Foreign Policy*) which is based on an array of social, political and economic indicators. It is imperative that the products of animal and plant agriculture research, extension, and supporting infrastructure be focused on these countries to help relieve the poverty, hunger (starvation) and malnutrition, thereby contributing to overall stability and ultimately eliminating the vast economic inequality that exists.

A brief summary of the research recommendations and priorities contained within the 415 page book follows. They are founded on the previously stated underlying assumptions of the Committee and criteria for sustainability whereby global food security can be successfully achieved. The report emphasized that research based on the obvious need to establish intensive sustainable animal production systems must be founded in an integration of environmental, economic and social components. An overarching recommendation urges a holistic approach to future research involving inter-and transdisciplinary research and well planned collaboration between public and private sectors. Global climate change as affected by greenhouse gas emissions, and study of its impact were important recommended research topics contained within the recommendations. Changes in climate result in corresponding changes in the availability of resources that must be met with research that will yield effective adaptation and mitigation responses. Climate change also influences the direction of other recommended areas of research.

The Committee emphasized the need to improve the ability of researchers to effectively communicate and engage with the public concerning their research endeavors and consequently gain trust. Meaningful education of future animal scientists through revision/reorganization of curricula combined with more hands-on training were emphasized. A complementary increase in infrastructure and improvement of existing facilities were deemed essential.

For U.S. aquaculture, the need to increase the production of animal protein through expansion into the marine environment was noted with recognition of land and freshwater resources becoming increasingly limited. Marine aquaculture products in 2012 represented only 10% of the total volume produced nationally, meeting just 5 to 7 percent of

the U.S. demand for seafood. The significant dependence of the U.S. on imports (> \$10 billion) to meet seafood demand may not be supported in the future, as other countries, particularly China, reduce imports to meet the increase in domestic consumption arising from a respective increase in economic status of citizens. Nationally, the culture of mollusks was identified as a highly sustainable practice and improvement of technology of sea cage culture was recognized as a research priority.

On land, recirculating aquaculture systems, biofloc technology systems and partitioned aquaculture systems (PAS) were identified as areas of research with attractive potential to achieve the desired sustainable intensification. Technologies need to be developed to minimize the effect of animal wastes on the environment. Feedstuff alternatives, fish meal and fish oil substitutions as notable examples, were noted as a continued research focus. These alternatives must be inedible and notably reduce the cost of animal protein in feeds while reducing the environmental foot print of feeds. Changes in feedstuffs in feeds must not compromise the overall health of the animal and the consumer. Sub-therapeutic use of medically important antibiotics in aquaculture production practices is being phased out in the US to hopefully thwart the rise of antibiotic resistance in humans consuming the animal protein. Effective alternatives that confer greater benefits to the animal, such as higher feed conversion efficiency need to be a subject for research.

The literal lack of research in genetics, genomics and reproduction and applicable results that would increase production of aquaculture species were recognized as well as the need for a focus of research on animal welfare and animal health, natural corollaries of consideration in meeting the goal of sustainable intensification.

The Committee recognized that in many cases global research needs are similar to those identified for the U.S., particularly biosecurity and the management of disease which causes significant losses in product, and can adversely affect the livelihoods of producers, and regional/national economies. Outside the U.S., there is a critical need for infrastructure and well trained extension scientists so that results derived from recommended technology transfer research can be used to eliminate chronic barriers to adoption of technology. A progression from semi-intensive to intensive sustainable production systems is needed over time, particularly in Africa. Research must be directed to the use of technologies that are intrinsic to the regions, and financial support to assist developing countries must consider the social welfare of the communities.

The diverse economic roles of animal production in small-holder operations in Asia and Africa were noted with aquaculture serving as a good example. Anticipated increases in animal protein consumption, particularly seafood would be particularly satisfied through culture fisheries due to the depletion from capture fisheries. An increased demand for seafood would accordingly contribute to rural development, and an increase in employment improves the lives of the poor. The Committee recommended that with the increases in production, research also need to be directed to trade and certification issues. Employment opportunities would hopefully be extended to women who could receive training and education through public funds, a condition that has not been encouraged in the past. The critical role of women in the success of

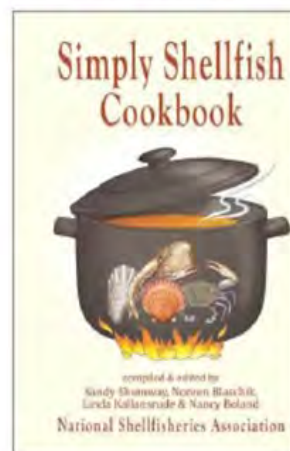
animal agriculture production in the Asian and African global regions was emphasized.

The report serves as a source of guidance for both public and private organizations in the development of future research strategies and corresponding funding decisions. This brief summary of the report is intended to introduce NSA members to the nature of the report's content, and what will probably drive future trends in animal agricultural production research. The full report can be downloaded for free and the book can be purchased through the National Academies Press website at <http://www.nap.edu/catalog/19000>.

Lou D'Abramo
Past President (2005-2007)

Great gift idea for the holidays!

Over 650 shellfish recipes!!



\$20 (including postage)

Make check payable to National Shellfisheries Association
All profits benefit the STUDENT ENDOWMENT FUND

Send order to:

Dr. Sandra E. Shumway, UConn Marine Sciences, 1080 Shennecossett Road,
Groton, CT 06340

NEW ANNOTATED BIBLIOGRAPHY AVAILABLE



SHRIMP NUTRITION & FEEDING: A SELECTED ANNOTATED BIBLIOGRAPY (1971 – 2014)

Albert G.J. Tacon, Thiago Raggi & Daniel Lemos
Laboratório de Aquicultura
Instituto Oceanográfico
Universidade de São Paulo
São Paulo, Brasil

This document contains a comprehensive, annotated list of publications dealing with nutrition and feeding of farmed penaeid shrimp. The 847 page publication is an impressive work on shrimp nutrition with chapters starting from *Attractants & Feeding Stimulants* to *Water Quality, Fertilization & Soils* and all topics alphabetically between.

The work was conducted with the support of The Brazilian National Council for the Development of Science and Technology (CNPq), and prepared as part of the activities of the AquaMar Research Project “Feeding Tomorrow’s Fish: Environmental and Sustainable Aquaculture Feeds and Feeding Regimes for Marine Farming”.

The project is funded by the CNPq under “Science without Borders – Special Visiting Researcher” program. It mainly focuses on practical and more urgent subjects in feeding and nutrition of farmed marine fish and shrimp, for the potential benefit of Brazilian farmers.

The literature review is part of the research program that is carried out by the AquaMar research team. The program also includes technical visits to local farmers, feed manufacturers, and laboratory and field experiments with target species.

SHRIMP NUTRITION & FEEDING: A SELECTED ANNOTATED BIBLIOGRAPY (1971 – 2014)

Available at:
<http://www.aquahana.com/wp-content/uploads/2015/07/AQUAMAR-SHRIMP-FINAL.pdf>

NSA 109th Annual Meeting March 26 – 30, 2017 KNOXVILLE, TENNESSEE

Yep, Knoxville. It’s a new venue for NSA and we are excited at the prospects. The Knoxville Marriott is a fantastic facility and has offered a great room rate of \$149.95 (single, double, triple, quad). The conference facilities are outstanding and this promises to be a great location.

Travel is easy – the airport is a hub for several airlines and provides a shuttle to the hotel just 15 minutes away. It’s also accessible from I-40, I-75, and I-81. Other airports are also possibilities and short drives away from Knoxville: Atlanta (3h), Nashville (2h) and Chattanooga (1h).

The hotel is located just a mile from the University of Tennessee campus, along with all sporting venues such as the Thompson Boling Arena and Neyland Stadium. The Volunteer Landing is a short stroll to dining and recreation. The Old City Historic District is a short, complimentary, trolley ride, and the Great Smoky Mountain National Park, including Gatlinburg and Pigeon Forge (Dollywood) tourist destinations are just 30 minutes away – bring the family and extend your stay!

If you have any ideas about topics for special sessions or would like to organize one, it’s not too early to let us know.

It is a beautiful time of year in Tennessee, mark your calendars now.

Stay tuned for more details.

Sandy Shumway





The 20th Annual International Pectinid Workshop: An Overview

Exactly two decades and ten meetings later, the International Pectinid Workshop returned to Ireland this year in April. The newest ‘Aunties’ (organizers) were Julie Maguire and Ellen-Sofie Grefsrud, and a fleet of student volunteers helped to ensure that everything ran very smoothly. Over 100 scallop workers attended the meeting representing Norway, Ireland, the U.K., France, China, Iceland, Brazil, Columbia, Mexico, Isle of Man, Spain, Croatia, Germany, Chile, Argentina, New Zealand, South Africa, Australia, the United States and Canada – twenty countries in all.

The Workshop began with a keynote address from Dan Minchin who reminisced about the old days and the initial Scallop Fonder meeting that was launched in a pub in Aberdeen, Ireland in 1975. Sessions on the first day covered ecology, general biology, and aquaculture of scallops. Presentations covered the scallop industries in South Africa, South America, Mexico, the Caribbean, and the United States. Sandra Shumway presented the fascinating results of field testing of a novel eco-friendly antifouling coating for the aquaculture industry, and showed convincing pictures of the effectiveness of this agent as tested in a range of environments from offshore pearl farms to shallow Florida coasts.

The conference continued with a session on fisheries that covered how, why, and where scallop industries have changed in New Zealand, Australia, the United States, Isle of Man, the United Kingdom, and France. Mervi Kangas described how populations of scallops in Western Australia plummeted after an extreme heat wave in 2010/2011. An early assessment of newly recruited scallops less than one-year-old prevented overharvesting of a small stock and saved industry the cost of gearing up their fleet.

There were two sessions on physiology of scallops as well as several posters. Presentations and posters on the physiology of scallops covered topics from links between morphology and behavior as described by Isabelle Tremblay, to the peculiar evolution and development of the convex image forming eyes of the scallop presented by Daniel Speiser, to QTL gene mapping of the orange color in scallops presented by Xiaoli Hu.

On Saturday of the conference, the second keynote speaker, Kevin Stokesbury, presented on marine protected areas in the U.S. Federal fishery and how they have fared during the last 15 years. This talk was a wonderful overview on the pros, cons, and implementation of spatial management in the scallop fishery. The pro side is that sea scallops are well suited to a rotational management strategy, but on the con side, scallops in closed areas are subject to mass mortalities. What is still elusive after all these years is the stock-recruitment relationship which hinders a traditional fisheries management plan.

This keynote speech was part of the special session on Marine Protected Areas. There was very strong representation from Maine, with three complementary talks on the inshore state fishery of the state of Maine. Trish Cheney presented the Department of Marine Resources perspective on the implementation of spatial closures, Carla Guenther explained the incorporation of fishermen’s local knowledge of those spatial management plans, and Caitlin Cleaver presented on initial findings of a small-scale closure experiment initiated by fishermen. Deborah Hart (Woods Hole NMFS) discussed the scallop fishery in the U.S. in the regions further south of Georges Bank, and Sam Dingnan explained how fishermen on the Isle of Man are learning to manage themselves. The session ended with talks by Leigh Howarth and Bryce Beukers-Stewart on the exploration of marine protected areas and spatial management of scallops on the western coast of Scotland.

The theme of the meeting, “scallops in a changing world,” was addressed in talks scattered throughout sessions, but the session holding that title explored topics covering the fossil record, to scallop shells holding temperature and environmental records, to the response to ocean acidification in the modern era. The keynote speaker, Laurent Chauvaud, brought up the importance of daily periodicity of striae formation in several genera of scallop. This enables precise calibration of geochemical tracers during the growth period which is something that is often impossible to do with other species. These striae allow individual, population and environmental stories of scallops to be followed.

This second special session covered topics including the heat tolerance of bay scallops, experiments that revealed how ocean acidification may affect veliger larvae, and several talks covering the use of isotopes and growth rings in *Pecten* species to monitor environmental change. The Alan Ansell Award for the best student talk was presented to Burgel Schalkhausser who gave an insightful talk on how scallops become easy prey under ocean warming and acidification. The last few talks of the conference covered biotoxins and resource management. Highlights included the use of DNA in food labeling and modeling larval dispersal in the English Channel.

The conference ended with a fabulous gala dinner that won’t be forgotten. The Glitter Bugs put on their rendition of classic 70s and 80s tunes and had the whole conference out on the dance floor. And what visit to Ireland would be complete without a trip to the Cliffs of Moher, a boat and bus tour of Connemara, and a scavenger hunt around Galway?

The [21st International Pectinid Workshop](#) is scheduled for April 2017 in Portland, Maine. What will be lacking in Irish charm, they’ll make up in sea scallop and lobster dinners, baseball, and microbrew pubs. Contact the organizers Kevin Stokesbury, Sandy Shumway, or Jay Parsons if you are interested in organizing sessions.

Skylar Bayer



Student Research Grant

Application Deadline:

November 2nd

The deadline for applications for three student research grants offered by the National Shellfisheries Association is fast approaching. The Melbourne R. Carriker Student Research Grant supports promising basic research in the area of shellfish, while the Michael Castagna Student Grant for Applied Research supports applied areas of research in shellfish and aquaculture. The George R. Abbe student grant supports research specific to crustacean biology and fisheries management. All of these competitive grants help cover the costs of conducting research in an era of dwindling financial resources. Students are strongly encouraged to apply for these awards. The process is relatively painless and the potential rewards are great! Students may apply for all the awards, but must submit separate applications that highlight appropriate aspects of their research for each. An applicant must be a NSA student member in good standing and currently enrolled as a M.S. or Ph.D. student in a recognized, degree-granting institution. Students may not apply for an award they have received previously. The deadline for applications is **November 2nd, 2015**.

Recipients of Carriker, Castagna, and Abbe Awards are encouraged to present the results of their research at an annual meeting of the Association and are required to write a synopsis of their research for the NSA Quarterly Newsletter. These awards provide students with \$1,250. The funds are intended for the purchase of supplies and equipment essential to perform their research, and are not intended to enable purchase of general items, such as computers, or to fund travel expenses associated with attendance at professional meetings. The good news is that students can apply for travel support through the NSA Student Endowment Fund.

To apply for the Castagna, Carriker, or Abbe Awards, send the following as a single pdf file to Past President, Chris Davis (cdavis@midcoast.com):

- Cover sheet with the applicant's name, professional address, phone number, email address, thesis title, degree being sought (M.S. or Ph.D.), date they entered the graduate program, and anticipated graduation date.
- Project description - 2-page limit plus one page for figures (if needed). Note, any literature cited is not included in the 2-page limit.
- Budget (1 page) - Briefly itemize how the award will be spent (e.g., \$300 for micropipette supplies, \$200 for histology supplies, etc.).
- Resume (1 page) - List educational background, awards/honors, presentations at meetings, and any publications.
- Letter of endorsement (1 page) - The student's major advisor must provide a succinct letter of support commenting on the student's research and confirming that the funds are necessary.

Applicants will be notified of the status of their application by **January 15, 2016** and awards presented at the Annual Business Luncheon in Las Vegas. Additional details are available online at www.shellfish.org/grants.htm.

Chris Davis
Chair, NSA Awards Committee

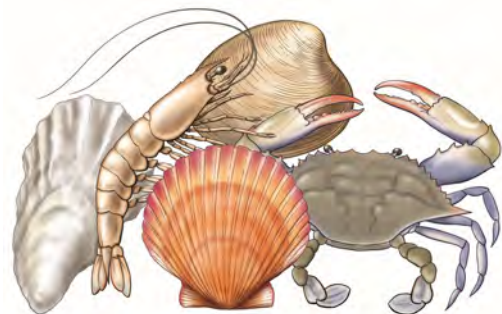
Nominations Sought

Honored Life Member, David H. Wallace, and Bourne-Chew Awards

The National Shellfisheries Association offers three major awards. The Honored Life Member Award is given to individuals who, by their exemplary service to the Association or to the profession, deserve recognition. The David H. Wallace Award is given to individuals whose activities in shellfisheries, aquaculture and conservation have promoted understanding, knowledge, and cooperation among industry members, the academic community, and government, as exemplified by Mr. David H. Wallace during his lifetime. The Bourne-Chew Award is in recognition of an individual whose actions demonstrate the principles in shellfisheries aquaculture, education, outreach, and extension exemplified by Drs. Neil Bourne and Ken Chew during their lifetime in mentoring, teaching, researching, and promoting understanding and knowledge among industry members, the academic community, and government. Recipients of these awards receive a plaque and lifetime membership in the Association.

Nominations for these awards should be carefully considered by those making the nomination. The awards are intended for truly deserving individuals, are prestigious to the individual receiving the award, and important to NSA and our long history. Initial nominations are reviewed prior to forwarding to a Committee of Past-Presidents for consideration. Nominations may then be forwarded to the NSA Executive Committee for final consideration. For more information on these awards, visit the NSA website (www.shellfish.org).

Nominations of individuals for these awards should be forwarded to Chris Davis, Chair of the NSA Awards Committee by **November 2, 2015**.



Congratulations to the Recipients of the Thurlow C. Nelson and Gordon Gunter Student Presentation Awards

It was another banner year for student participation and excellence at the 107th NSA Annual Meeting in Monterey. There were more than 50 oral presentations and nearly 40 posters presented by student members. We would like to thank all of the student presenters for their hard work and recognize a few presentations that stood out from the crowd.

THE THURLOW C. NELSON AWARD

The *Thurlow C. Nelson Award* is given for the outstanding oral presentation of research that represents a distinctive and valuable contribution to shellfisheries science. The Award is named after the distinguished shellfish biologist who served as NSA President from 1931-1933 and contributed more than 125 papers, many relating to oyster biology

Applied Sciences

Laura Newcomb, University of Washington Friday Harbor Laboratories, “Measuring risk: Uncovering the role of water temperature and pH on seasonal changes in mussel attachment strength.”

Ecology & Physiology

Jeff Clements, University of New Brunswick Saint John, “Clams on acid: Experimental effects of sediment acidification on burrowing behavior and dispersal of juvenile soft-shell clams.”

Genetics & Disease

Xiaoshen Yin, University of Southern California, “Improved analysis of crossbreeding trials to increase the yield of farmed Pacific oysters.”

THE GORDON GUNTER AWARD

The Gordon Gunter Award is given for the outstanding poster presentation of research that represents a distinctive and valuable contribution to shellfisheries science. This award recognizes the important and essential role of poster presentations as a vehicle for research communication.

Applied Sciences (tie)

Christina Fuentes, California State University Fullerton, “Olympia (*Ostrea lurida*) and Japanese (*Crassostrea gigas*) oyster recruitment onto a constructed oyster bed in Alamitos Bay, CA.”

Rick Torres, California State University Fullerton, “Recruitment, survival, and growth of the Olympia oyster (*Ostrea lurida*) and the Japanese oyster (*Crassostrea gigas*) as a function of tidal height.”

Genetics & Disease (tie)

Brittany Wolfe, Virginia Institute of Marine Science, College of William and Mary, “Comparative larval performance between tetraploid x tetraploid and tetraploid x diploid constructs using mosaic and non-mosaic *Crassostrea virginica* parents.”

JoAnne Linnenbrink, California State University Fullerton, “Genetic population structure of the Olympia oyster, *Ostrea lurida*, in southern California.”

Ecology (tie)

Rebekah Borgert, Auburn University, “Factors affecting value of off-bottom oyster aquaculture cages as habitat for juvenile blue crab.”

Natalie Coleman, Oregon State University, “The dirty secret on burrowing shrimp growth: Verification of two alternative methods of age determination in the burrowing shrimp, *Neotrypaea californiensis*.”

We are very grateful to all of the NSA members who volunteered to judge the student presentations. We could not have completed another successful student presentation award competition without your dedication and support – **THANK YOU!**

Lisa Milke, Stan Allen, & Nature McGinn

Student Endowment Fund Awards Committee Co-chairs

The Journal of Shellfish Research was awarded the 2015 APEX Awards for Publication Excellence!



Progress for Scallop Aquaculture in Maine

Like everything, aquaculture of the Atlantic sea scallop (*Placopecten magellanicus*) has come with some exciting advances, some challenges, and there are plenty of things yet to emerge. This is true of recent trials in Maine, where seven farms have scallops in different stages of production and sales since 2012, but with plenty of work to do yet.



The impetus behind the work is easy to see: the wild fishery is the most valuable scallop fishery on the planet and worth in excess of a half-billion dollars. Maine scallops occupy a top-shelf reputa-

tion among chefs and consumers, and so the potential to deliver freshly-harvested scallops to the market year-round is compelling.

Cage culture has been the focus to date; shellfish bags in bottom racks, and stackable trays such as the Aquatray seem to work well, with growth frequently ranging between 0.09 and 0.15mm/day, even during the coldest months. Sea scallops don't like crowding and they can't be packed like oysters can. Smaller scallops can tolerate higher densities to some degree, but around 2" shell length, they will suffer increasing damage from 'claspings' - where two scallops clamp down on one another. As the adductor muscle gets stronger, this claspings results in mantle and shell damage, and the scallops will begin to show a stunted form. Once past that 2" size, a bottom density of 20-30% bottom coverage is a maximum, which means that equipment and labor costs factor significantly.



Marsden (left) and Bobby Brewer lift a bottom cage for inspection - Stonington, Maine. Such bottom cages use ordinary shellfish bags and can be adapted in size and shape depending on preference.

Scallop spat collection in Maine coastal waters has been consistently strong, with counts in collectors frequently exceeding 2000 per collector. Collectors are set in September, watched and maintained during the winter, and hauled most commonly in May through June, at which point seed commonly ranges between 5 and 15mm. Scallop seed itself has a value, with some seed sales having taken place in the past two years.

Initial sales of scallops have targeted the live market, to capture maximum value. The essential issue here is biotoxins - principally saxitoxin and domoic acid, the compounds responsible for Paralytic Shellfish Poisoning (PSP) and Amnesic Shellfish Poisoning (ASP). While PSP and ASP are rarely found to a dangerous degree in the adductor muscle, they are more common in the other tissues, where they can persist at high levels for long periods, and where they can change form over time. This complicated physiology means that testing whole product must be done with some frequency - all of which comes at a cost. While future technology may alleviate the costs for such testing, the current testing approach (HPLC) has limited the ability of new growers to meet the market demand cost-effectively.



Scallop seed: Scallops are shaken out of the collectors into a seawater bath; good sites will return scallops 10mm and above when removed from collectors in June or July.

Some recent funding through the Maine Aquaculture Innovation Center to Maine Sea Grant and its partners will advance the knowledge of how scallops perform culture, together with data collection on biotoxin levels over time, and information about market opportunities. Reaching for a piece of a half-billion dollar pie is a pretty good motivator, so the outlook is for continued industry interest, collaboration and innovation.



Scallops in these Aquatrays can remain clean even when the outside of the trays will foul, likely because of movement within the cage. These scallops are also due for thinning.



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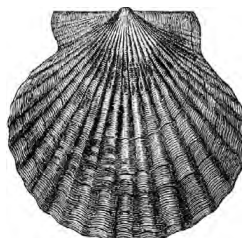
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Upcoming Events

Goal 2015 – “Global Outlook on Aquaculture Leadership”. October 26 – 29, 2015. Vancouver, Canada. A Global Aquaculture Alliance sponsored conference. For more information:
<http://gaalliance.org/GOAL>.

Interstate Shellfish Sanitation Conference – October 24 – 29, 2015. Salt Lake City, Utah.

FENACA, M and LACQUA’15 – “Science and Industry Joining Forces to Meet Seafood Demands”. November 16 - 19, 2015. Fortaleza, Brazil. Regional meeting of WAS Latin America - Caribbean Chapter.

National Working Waterfronts and Waterways Symposium – November 16 – 19, 2015. Tampa, Florida.

Aquaculture 2016. February 22 – 26, 2016. Las Vegas, Nevada. Triennial meeting of WAS, NSA, AFS, USAS. For more information, visit: the NSA website: <http://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, LeRoy Creswell (creswell@ufl.edu).