

National Shellfisheries Association

QUARTERLY NEWSLETTER

December 2007

GROTON, CT



President's Message

I don't know what the weather is like in your part of the world, but as I'm writing this we are just finishing a spectacular display of fall foliage here in southern New Jersey where I live and work. With leaves falling and a chill in the air I think about some of my favorite cold weather shellfish dishes – clam chowder, oyster stew, oyster stuffing. I'm sure you all have your own favorites. Alas, dinner is not 'till later on and the topic of the moment is NSA.....



Throughout this newsletter you will find information about the upcoming Centennial Anniversary meeting in April 2008. This is certainly a meeting not to miss. Sandy Shumway, Karolyn Hansen and their crew of hardworking volunteers are busy chasing down speakers and sponsors while also organizing a host of special events. New information is being added to the web page (www.shellfish.org) every week so visit there often and click on the meeting logo to learn the latest. Abstract submissions and meeting registrations are being accepted, but don't forget to log in so everything can be linked to your membership. If your colleagues are not members, instruct them to create a free login account to submit their abstracts and registrations – it's easy and it's free — better yet **encourage them to join**. They will more than recoup their membership fee from the reduced member rate for meeting registration, subscription to JSR, the Quarterly Newsletter and other NSA member benefits.

In the last newsletter I mentioned the BioOne member access to JSR online as a new member benefit spearheaded by Susan Ford. Many of you have already visited the BioOne link and the early report is that JSR is one of the most sought out journals based upon the number of hits received! The BioOne online access begins with Volume 24 and we are continuing to look for ways to place

previous issues, as well as JSR's predecessor *The Proceedings of the National Shellfisheries Association*, online. Remember, this is a member benefit so you must be logged in to access full text and pdf files of JSR via BioOne.

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The centennial meeting of NSA will be held in beautiful Providence, RI. For more information about this exciting meeting, see pages 2-3.

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Like most non-profit organizations, NSA thrives on volunteers from within its membership who contribute their time to ensure tasks are accomplished in a timely and professional manner. Like Susan Ford's efforts to get JSR online, the individuals listed on the back of this newsletter set examples for us all to follow. This Newsletter, for instance, is diligently produced by Evan Ward who relies upon many of you to contribute articles, reviews and other news – you can do this by contacting Evan and sending him items of interest. The Membership Committee, Student Awards Committee and Industry Committee can always use assistance – and students should volunteer to help The Recruits. Meetings are also a great place to volunteer. Help is always needed with a variety of tasks including organizing, chairing or moderating sessions (contact Sandy Shumway or Karolyn Hansen); helping at the registration desk, or with the student auction, A/V or special events (contact The Student Recruits co-Chairs Nature McGinn or Dane Frank); arranging food donations (contact Ed Rhodes or Gef Flimlin); or judging student talks (sign up when you register for the meeting or contact Ami Wilbur and Ryan Carnegie directly). Take a minute to consider where you can help, then contact me or the appropriate Committee Chair.

In closing, I hope that your research, production or management efforts are going well, that you are working toward submitting an abstract for the meeting, and that you'll consider volunteering to help strengthen and promote the Association.

Dave Bushek
President



The Westin Hotel, Providence, RI)

Centennial Meeting Information

Plans are well-underway for the centennial celebrations to be held at the Westin Hotel, Providence, Rhode Island, April 6-10, 2008. By the time you receive this Newsletter, the registration forms and call for abstracts should be on the NSA Web page. Please pay particular attention to the **JANUARY 31 DEADLINE**. This is the absolute deadline as dictated by the printers - material submitted after this will not be included in the abstract book or program. We will, however, be able to accommodate posters after this date.

As always, we expect the Presidents' Reception to be a blockbuster affair with a bounty of shellfish. Lots of special sessions planned (see Call for Abstracts, pg. 3) including a Roundtable Discussion and cocktail party featuring many of our senior members. Posters will be a prominent feature of the meeting and will be highlighted during a dedicated session with happy hour and special treats. And don't forget the Auction on Tuesday evening – start cleaning those closets now and bring your contributions with you or ship ahead to Sandy (address on back of Newsletter). If you want to reserve tickets for the Thursday evening showing of *Volcanoes of the Deep* – an IMAX movie by our very own Rich Lutz, you need to do it early. The \$10 fee gets you into the IMAX theater and buys you your very own DVD of the movie! Even the Business Meeting looks to be an exciting time – be there for the festivities, it's included in your registration (oh yeah, you'll also get breakfast at this meeting.....). For updates on meeting activities, go to www.shellfish.org.

And remember, the Benthic Ecology Meeting will begin on Wednesday evening. That will mean lots of interactions between the groups and special sessions of interest to both NSA and BEM are scheduled for Thursday morning (e.g., benthic-pelagic coupling, sea urchin ecology and biology, and others). Don't miss the Beach Party on Saturday night!! You are encouraged to register for both meetings and take advantage of the opportunity! For more information on the BEM, go to www.benthicecology2008.uconn.edu.

Sandy Shumway, Local Arrangements Chair
Karolyn Hansen, Vice-President & Program Chair



CALL FOR ABSTRACTS

A CENTURY OF SHELLFISH

100th National Shellfisheries Association Annual Meeting APRIL 6-10, 2008 Providence, Rhode Island

Please plan to join us for a fantastic NSA Centennial Meeting. We have a distinguished group of invited speakers, a diverse array of special sessions, a Centennial Roundtable of senior shellfish scientists, a 'Most Beautiful Oyster' Contest, a special screening of the IMAX film *Volcanoes of the Deep* by NSA's own Rich Lutz, and the not-to-be-missed Student Endowment Fund Auction. We are fortunate to have an exhaustive list of sponsors this year thanks to the efforts of Sandy Shumway. All the details are posted on the NSA website – look for regular updates as our session list and meeting schedule expands. Abstract submission details are online at www.shellfish.org. If you are interested in presenting at any of the special sessions, please contact the session organizer (see below), or submit your abstract for other contributed sessions that are forming. Be sure to designate your presentation as oral or poster. Abstracts should be no more than 200 words (body of abstract). Subsequent to receipt of your abstract, you will be notified of its acceptance as an oral or poster presentation and provided specific guidelines for your presentation. **ABSTRACTS ARE DUE JANUARY 31, 2008 and must be submitted through the NSA website – www.shellfish.org. NO ABSTRACTS WILL BE ACCEPTED AFTER JANUARY 31, 2008. NO ABSTRACTS WILL BE ACCEPTED VIA FAX TRANSMISSION.** If you are unable to submit via the NSA website or have any questions about abstract submissions, please contact Karolyn Hansen, Program Chair, at Karolyn.Hansen@udri.udayton.edu, or call (937) 229-2141. If you are an invited speaker in a session, please send your abstract to the session organizer as well.

Online **MEETING REGISTRATION** is now open on the website and you are encouraged to take advantage of the significant savings for Early Registration which ends January 31, 2008. **HOTEL REGISTRATION** at the meeting rate of \$159/night is also available online with a cutoff date of **MARCH 5, 2008**. Register NOW for the meeting and hotel! See you in Providence!

Karolyn Hansen
Vice-President & Program Chair



Current List of Special Sessions (more to come!)

- Abalone** - Peter Cook (pacook@cyllene.uwa.edu.au)
- Asian Shellfish Aquaculture** - Giming Guo
- Bay Scallops** - Bill Arnold (bill.arnold@myfwc.com)
- Benthic-Pelagic Coupling** - Evan Ward (evan.ward@uconn.edu)
- Biofouling** - Sandy Shumway (sandra.shumway@uconn.edu)
- Bivalve Diseases in Aquaculture and Restoration** - Marta Gomez-Chiarri (gomezchi@uri.edu)
- Coastal Habitat Assessment Using GIS** - Pam Neubert (pneubert@ensr.aecom.com)
- Centennial Roundtable** - Susan Ford (susan@hsrlrutgers.edu)
- Genetics** - Dennis Hedgecock (dhedge@usc.edu)
- Horseshoe Crabs**
- Lobster Disease**
- Molluscan Dialogue** - World Wildlife Fund
- Restoration Panel Discussion** - Rob Brumbaugh, The Nature Conservancy
- Restoration Technical Session** - Ken Paynter (painter@umd.edu) & Steve Allen (stevenmallen@gmail.com)
- Sea Urchins** - Mick Devin (mdevin@trufresh.com)
- Shellfish and Public Health** - NESSA Session, Martin Dowgert (martin.dowgert@fda.hhs.gov)
- Shellfish Industry Session**
- Shellfish Physiology** - Lewis Deaton (led9784@louisiana.edu) & Dane Frank (dana.frank@uconn.edu)
- Shrimp**
- Special Student Session: 'Getting Hired'** - Nature McGinn (namcginn@ucdavis.edu) & Dane Frank (dana.frank@uconn.edu)
- Soft-Shell Clam, *Mya arenaria*** - Bill Walton (wwalton@whoi.edu) & Brian Beal
- QPX** - Roxanna Smolowitz (rsmol@mbl.edu)

Meeting Bonus!

The Northeast Shellfish Sanitation Association (NESSA) will be meeting in conjunction with the NSA meeting and Dr. Laurie Backer, from the Centers for Disease Control and Prevention, will be a guest speaker. Information regarding NESSA participation can be obtained from Martin Dowgert (martin.dowgert@fda.hhs.gov) or Sandy Shumway. This is an added bonus for our members to hear the latest news regarding shellfish and public health.

Recruits' Corner

Ladies and Clams,

Four score and nineteen and a half years ago, our forefathers gathered for the first official meeting of the National Shellfisheries Association. That makes the 2008 meeting our Centennial celebration! Join in the revelry as we celebrate 100 years of organized shellfish research. Present your most compelling work, make professional contacts or just come and see your friends. It's also affordable! Just apply for a **Student Travel Award** when you register for the meeting. Choose free registration or free shared lodging! But wait, there's more...the application deadline for the **Student Travel Awards** has been extended to **January 31** to coincide with the abstract submission deadline. Go to our website, www.shellfish.org/recruits.htm, for more information about these and other student opportunities, and while you're at it check out our new format. Don't forget that fame and glory (and **\$1000.00**) await those applicants whose research is chosen to be recognized with the Melbourne R. Carriker Student Research Grant or Michael Castagna Student Grant for Applied Research. You did apply, didn't you? Also, we co-Chairs are organizing another in our series of remarkably informative student sessions and this one will be entitled "Getting Hired". This seminar is a must if you plan to ever work for a living and will include valuable information on refining your CV, interview tips, salary negotiation strategies and stories from the trenches.



Another special thing about the 2008 meeting is that it will be directly followed by the Benthic Ecology Meeting (with a one day overlap) and there will be special deals and discounts available to help you attend all or part of BEM. It will be a week of scientific discovery with lots of opportunities to meet and mingle, see and be seen by your fellow scientists and students. So, in summary, prepare your work, register for the meeting, apply for a travel award online and take the opportunity to attend some or all of the Benthic Ecology Meeting. If you have any questions or suggestions please contact either Dane or Nature. See you in Providence, (it's an offer you can't refuse!)

Dane Frank & Nature McGinn
Student Recruits



Student Travel & Presentation Awards

Applications for the Student-Endowment-Fund (SEF) travel awards for the centennial meeting in Providence are due on **January 31, 2008**. This is the same day that abstracts are due. Award recipients may receive support for either lodging or meeting registration, depending on specified preference, and all applicants will be eligible for the Thurlow C. Nelson Award, for best student-oral presentation, and the Gordon Gunter Award, for best student-poster presentation. Application forms and instructions are available on the web at www.shellfish.org. Please contact us (Ami: wilbura@uncw.edu; Ryan: carnegie@vims.edu) if you have any questions.

Also, judges will be needed to evaluate SEF award application submissions during the first week in February. We encourage non-student NSA members interested in reviewing applications to contact us. See you in Providence!

Ami Wilbur & Ryan Carnegie
Endowment/Student Awards Committee

Deep Bay Field Station will Focus on Shellfish Research

The Centre for Shellfish Research (CSR) at Malaspina University-College in Nanaimo, British Columbia is building an off-campus research and training field site in Deep Bay, BC. This new site will include an upland seawater tank farm, laboratory, demonstration shellfish farm and act as a combination research facility for shellfish aquaculture, marine ecology and water quality. "We want to showcase responsible development while providing leading edge research opportunities," said Brian Kingzett, Station Manager for the Deep Bay site.

Don Tillapaugh, the Director of the CSR sees the new field station as an exciting opportunity for Malaspina, the CSR and the shellfish aquaculture industry in BC. "We'll be working with different campus departments on various projects - with the business faculty to investigate the costs of shellfish production issues, with the international faculty to facilitate international training opportunities and with other departments as the site expands." The Deep Bay facility will also serve as a public engagement facility.

The current timeline should see the Deep Bay site up and running by 2008. For more information on the Deep Bay facility, contact Brian Kingzett at kingzettb@mala.bc.ca.

John Gardiner, Writer
Malaspina University-College

Book Review

Scallop Farming (2nd Edition). D. Hardy. Oxford: Blackwell Publishing, 2006, IX +315 pages, ISBN-10:1-4051-1363-4 (Hardback; £69.50)

When the first edition of **Scallop Farming** was published in 1991, it was heralded by the publishers for its useful illustrations, description of the biology of scallops and international scope of scallop culture. Written by an experienced scallop farmer, it offered a first hand account of the topic, demonstrating how to make the most of basic equipment needed for culture efforts and stressing the use of 'homemade' anchors, rafts, cages and sorting tables – in general, a no nonsense and common sense approach to scallop aquaculture. At the time, scallop aquaculture was in its infancy and the book was a welcome addition to the literature. It was popular because it was written by a scallop farmer and the only available focused treatment of the subject. There were 12 chapters (237 pages including references and index) that covered methods of cultivation, spat collection, site selection, handling and processing and design and manufacture of equipment.

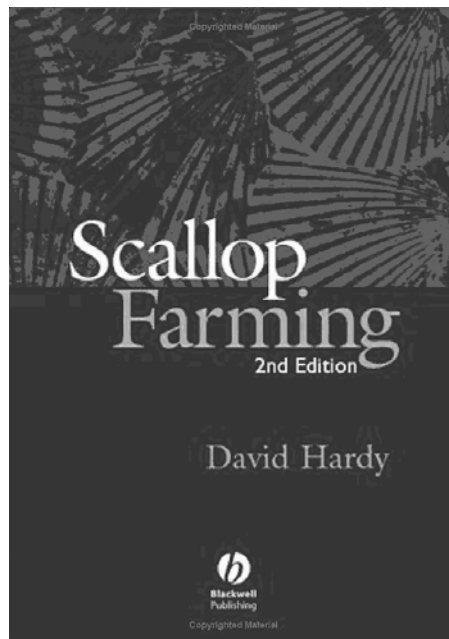
This 2nd Edition, as the first, might more appropriately have been called 'Experiences of a British scallop farmer'. In this context, the reader would come away with a much different (and probably more favorable) impression of the effort. The author uses the British/European king scallop, *Pecten maximus*, as a 'useful model' because this is 'the one that most people seem familiar with'. Perhaps so in Europe, but certainly not the rest of the world. Further, this is a long-lived species and some of the largest scallop aquaculture efforts globally focus on the short-lived, fast growing species of *Argopecten* and others. The brief section on regulations also focuses, albeit superficially, on UK specifications and agencies.

The 2nd Edition is described as including 'practically oriented advice, new technical, environmental and legislative information and key information for running a successful farming operation.' It is further touted as 'an essential tool for all those working in the scallop farming industry and will be an important source of reference for equipment manufacturers and suppliers, traders and policymakers, environmental and marine scientists and university and research establishments where these areas are studied and taught.' I believe this volume falls far short of all those assertions. The new edition includes 15 chapters (315 pages including references and index). The

presentation is myopic and most of the book reads as an extended essay and/or personal account of scallop culture, mostly within the United Kingdom. The early sections (Chapters 1 and 2) on world interest, the farm environment and its microscopic inhabitants, plankton life and seasonal variations, red tides and algal toxins are superficial, confused and, in some cases, the statements made are simply incorrect, e.g. that diatoms are larger than dinoflagellates, that no energy is expended by the scallops in pursuit of food, and others. Moreover, most of the information is simply a collection of factoids and is never integrated with scallop culture per se. There are few

references to published literature or other sources of information and the book is full of statements, figures and tables with no attribution to the original sources. I found that a lot of material from the first edition has been rearranged, but little new, other than photographs, has been added with regard to information on biology and culture methods including design of equipment, moorings, use of divers, and other topics. While the author includes a heading entitled "World Symposia" that mentions, in very general terms, the fact that there have been symposia on ocean ranching and notes their 'invaluable role in prompting many countries to take up the challenge of scallop farming,' there isn't even a mention of the International Pectinid Workshops (held biannually for the past 30 years) or the wealth of data and papers generated

from these meetings, and the role they have played in providing academics and growers alike with a specialized forum for the exchange of information in scallop culture. One important topic that is given superficial treatment is the role of algal toxins in scallop culture. The reader is left with a description of several toxins, but no clear description of the role or impact of these toxins in scallop culture, or even acceptable levels of toxins and international regulations (in the UK, EU or elsewhere). Another important topic treated very superficially is regulations in general. The chapters on the business of scallop farming and packaging and marketing are an interesting addition, but again, fall far short of providing very much useful or specific information. I enjoyed the sections on gear and farming logistics, and they clearly convey the years of experience of the author. It would have been nice to see more actual photos than free-hand drawings. While there are some good pointers in the section on the business of



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Book Review... Continued from page 5.

farming, there reader is left expecting more, e.g. a guideline for preparing an actual business plan. The section on fishing for scallops, crabs, prawns and lobsters seems out of place.

By far the most disappointing aspect of the book is the fact that after 16 years, the author has added a mere five new entries to the bibliography and there are only two references post 1998. Culture of scallops has expanded exponentially and on a global scale during the past 15 years and there is little hint of that in this volume. While this book is a superficial treatment of global scallop culture, it is an interesting read provided by an experienced grower. Unfortunately, if you own the first edition there is no need to purchase the second.

Sandra E. Shumway

University of Connecticut

(Reprinted from Aquaculture International)

Asian Oyster Research Presented at ERF

Research on the Asian oyster *Crassostrea ariakensis*, proposed for introduction to Chesapeake Bay, has yielded important new information about this oyster species and its potential interactions within estuarine ecosystems of the eastern United States. In 2004, a collaborative research program was initiated, funded largely by NOAA, and includes more than 50 studies conducted by scientists at 15 academic institutions, government research laboratories, and private consulting firms. The work is providing crucial scientific information for an Environmental Impact Statement evaluating the pros and cons of the proposed introduction and 7 alternatives, which federal and state agencies expect to release for public review in May 2008.

Many of the research findings to date were summarized at the Estuarine Research Federation meetings in Providence, Rhode Island on November 5, 2007. Presentations were developed with input from multiple researchers to synthesize results across numerous projects on key topics: understanding *C. ariakensis* in its native range – taxonomy, population genetics, distribution, and ecology; oyster diseases; potential interactions with native oysters; demographic and larval transport modeling; economic and fishery management; and broader geographical and temporal contexts provided by examples of other oyster introductions.

Also unveiled at the ERF meetings was a printed series that has been produced to summarize the research with high graphic content for all audiences such as managers,



From left to right: Ryan Carnegie (VIMS); Ximing Guo (Rutgers); Dianna Padilla (SUNY Stony Brook); Doug Lipton (UMD); session co-chairs: Mark Luckenback (VIMS), Jamie King (NOAA), and Roger Newell (UMCES); Elizabeth North (UMCES); David Bushek (Rutgers); Edward Weber (Versar); Robert Wieland (Main Street Economics).

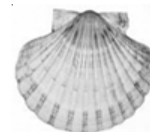
students, and the general public. Hard copies may be requested from Kim Couranz (410-267-5673; Kim.Couranz@noaa.gov), and digital pdf files are available at <http://chesapeakebay.noaa.gov/nonnativeoysters.aspx> (click on “Research, Quarterly Reviews, and Publications”). Please help us share this printed series widely, as it is an excellent educational tool for showcasing how the work of shellfish researchers is informing this important public policy issue.

Jamie King

NOAA

Request for Nominations for Wallace Award and Honored Life Member

Nominations are requested for recipients of the **David Wallace Award** and/or the **Honored Life Member Award** of NSA and should be sent to Dr. Lou D’Abramo at Ldabramo@cfr.msstate.edu or Department of Wildlife and Fisheries, Mississippi State University, Box 9690, Mississippi State, MS 39762. The NSA Awards Committee reviews nominations and selects recipients based upon demonstrated fulfillment of the criteria for qualification. A nomination should include a brief summary (no more than 2, double spaced, typed pages) of why the nominee deserves recognition. Descriptions and selection criteria of the Wallace Award and the Honored Life Member Award are available at <http://shellfish.org/awards.htm>. Past recipients of both awards are also listed on the National Shellfisheries Association website.



From the JSR Office

This will be a bonus year for members - we expect to see two special issues of JSR, one from the most recent abalone conference (guest edited by Peter Cook) and another on *Crassostrea ariakensis* (guest edited by Mark Luckenbach). Others are in the queue and we hope to unveil a surprise issue at the Centennial Meeting.



Manuscripts continue to arrive with figures that are nothing more than printouts from EXCEL and other spreadsheets. These are not of publication quality (see my Editorial, January 2007, Newsletter) and manuscripts are now simply being returned until they are in the proper format.

Cover photos are always needed - if you have something you would like to have considered, please send it along. Before you do, look at some previous covers to get an idea of the quality of pictures needed and please be sure they are in the proper 'portrait' orientation. And remember, any picture that includes people must be accompanied by their permission to use the image.

Next, the continuing plea for reviewers. I get plenty of authors asking why their paper has not been reviewed overnight, and many of the same people take months to review a paper (or never get around to it!). Everybody who is publishing should be reviewing - someone has to read your papers. Please volunteer or accept the invitation when asked.

I continue to get very little in the way of feedback on JSR so assume that no news is good news - write to me or the Publications Co-Chairs, John Kraeuter and Susan Ford, if you have comments.

Finally, welcome aboard to Linda Kallansrude who will be serving as our new NSA Administrative Assistant. You'll note her name on the return address for Newsletters and she'll be handling invoices for JSR. Linda has been helping the JSR office for many years and I am looking forward to a long collaboration!

Sandy Shumway
JSR Editor



In Memoriam - Stewart Tweed

Stewart MacMaster Tweed, Jr., a NSA member since 1979, died on February 8, 2007 at the University of Pennsylvania Hospital.

Mr. Tweed was born in Neptune, New Jersey (NJ) on March 15 1945. He received a Bachelor of Science Degree from Springfield College in 1967, and worked at the Chesapeake Biological Laboratory as a research assistant from 1967 to 1968, after which he began graduate studies at Rutgers University with Dr. Hal Haskin. Through these studies, on the biology of the oyster in Delaware Bay, he developed life long relationships with the Bay and its fisheries. In 1974 he left Rutgers for a position as Senior Aquatic Scientist at Westinghouse Environmental systems where he worked on various power plant siting projects including the Clinch River Breeder Reactor. Stewart left Westinghouse in 1978 to become Rutgers' first marine extension agent serving Cape May, Cumberland and Salem Counties in NJ. He became Department Head of Rutgers Cooperative Extension of Cape May County in 1991, and served in that position until 1996. He continued his work on oysters and expanded that to involve the entire NJ fishing community. Through this work he developed a fierce love of anything pertaining to the region's fisheries and the families that depended on them. In 1984 he was the prime motivator behind the establishment of the Cape May County, Commercial Fishing, Low-Interest Revolving Loan Program. Stewart served as the Chair of the Loan Selection Committee from 1992 to 2007. He was proud that this program had lent over \$3 million to County fishermen and continued to grow and serve the community. Stewart initiated the first USCG approved Fishermen's Safety Drill Conductor Course and Oil Spill Response training for Fishermen in the Mid Atlantic. He also presented an FDA Certified Training in Seafood Safety. Over 500 fishermen attended these courses.

In addition to his activities on behalf of the fishing community in southern NJ, he developed his own pilot scale oyster farm on the Cape Shore of Delaware Bay. In 2000 he became Rutgers County Agent Emeritus, began consulting for NJ Sea Grant, and worked, hands on, full time developing the oyster farm into a fledgling commercial enterprise. He received the Cape May County Board of Agriculture's Distinguished Service Award in 2005. In spite of his declining health he continued to work on the oyster farm, and with many of the other programs he had initiated.

Stewart is survived by his wife of 39 years, Gail; his mother, Miriam; his sister, Priscilla; his daughter, Patricia and her husband and two children, and his son James. He will be remembered as one who used his love of the sea to make a difference in his community and in the lives of those he served.

John Kraeuter
Rutgers University

Report from the 10th Annual ICSR, The Netherlands

The 10th International Conference on Shellfish Restoration (ICSR) was held in Vlissingen, The Netherlands from November 12-16, 2007. The theme for this year's conference was "innovation in the exploitation and management of shellfish resources." Aad Smaal and his compatriots at the Wageningen Institute for Marine Resources and Ecosystem Studies put together a very full agenda of scientific talks, posters, tours, dinners and entertainment. Topics included recruitment, ecosystem-based management, stakeholder involvement, and management and new technologies.



The Dutch are the leading suppliers of mussels to Europe producing 50,000 tonnes between the Oosterscheld and the Wadden Sea. To put this in perspective, the Pacific Coast Shellfish Growers Association estimates a paltry 1,200 metric tons of mussels are produced by U.S. west coast growers. The entire U.S. west coast shellfish production of all species of bivalves is estimated to be 48,000 tonnes, with approximately 43,000 of that being heavy shelled oysters. U.S. participants on the industry tour saw shellfish processing at a scale to which we are unaccustomed, as well as modern Modified Atmosphere Packaging (MAP). The Prins & Dingemanse's mussel processing facilities, Yerseke, has 10,000 kilogram purging tanks that feed into parallel processing lines with overhead gantry cranes!

Dutch mussel culture is done efficiently on the bottom utilizing large sea-going vessels which harvest seed from wild beds in the Wadden Sea to plant on exclusive leases either there or in the Oosterschelde. Like Pacific oysters on the west coast, crops may be harvested and transplanted more than once for growout and fattening. Yerseke, where all of the mussels are landed and processed, has the only mussel auction in the world. Samples are taken from ships' harvest lots, analyzed for size, meat yield, color and fouling. Bidders purchase the entire boat load which is then pumped out onto holding beds in the adjacent Oosterschelde.

As impressive as the magnitude of the culture operations, was the magnitude of controversy. The Wadden Sea being a nature preserve has been fertile ground for conflict between environmentalists and the shellfish sector. The large wild-harvest cockle fishery was recently eliminated

due to impacts on the environment. Mussel culture appears to be next in line. There is intense pressure from conservation groups to leave the wild-mussel seed beds for the eider duck population. With the writing on the wall, growers are scrambling to develop alternative seed sources. This is a daunting task with production of this scale. Innovative hanging spat collectors are being developed and tested along with suspended culture systems. Roem van Yerseke, who was experimenting with hatchery technology when I visited a couple years ago, has jumped in with both feet and is working aggressively to master hatchery seed production. Others who have marine beds and terrestrial farms on both sides of the dikes are proposing nursery culture in excavated ponds.

Pacific oysters spread to the Wadden Sea in 1998, with a massive naturalization and spread in 2003. Today it is estimated there are 15 square kilometers of sea bottom covered with oysters. Similarly in the Oosterschelde, Pacific oysters have naturalized and cover some 8 square kilometers. In the U.S. Pacific Northwest this would not be seen as a problem as the massive beds of oyster clusters would be seen as a resource to harvest, shuck and cull single oysters. Europeans unfortunately only consume their oysters live on the half shell. As such these oyster beds continue to grow, filtering precious algae previously available for the mussels, as well as mussel larvae themselves. Further complicating the situation is that many of the oysters are in preserves where they are protected.

From a grower's perspective, the ICSR included a number of great talks, a few which stood out to me. Peter Herman presented results from the EU MaBenE project (short for "Managing Benthic Ecosystems"). This project focused on the development of integrated management models for extensive cultures of shellfish (<http://www.nioo.nl/projects/mabene/>). Explaining that the primary interaction between suspension feeders and the ecosystem is through filtration and nutrient regeneration, Peter eloquently explained how physical interactions in the environment strongly influence these processes and their practical applications for culturing shellfish. Filter feeders are incredibly efficient with the ability to clear the water in short order. As such, systems that provide algae a chance to reproduce are actually the most productive. Intuitively growers think that turbulent well mixed water with current is best. MaBenE has show that this is not necessarily the case. For example, stratified fjords with nutriclines that are broken periodically by wind, provide algae with a refuge at the surface to reproduce. When this system is continually well mixed the algae are rapidly grazed off and the system is less productive. In shallow well mixed bays it is best to farm in smaller patches with space between them to provide algae time to reproduce as it passes between patches.

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International Industry News

ICSR Report... Continued from page 8.

Additional talks on integrated multitrophic aquaculture (IMTA) were thought provoking. Integrated culture systems - growing finfish, shellfish, macroalgae, worms, etc. all benefiting from and/or mitigating each other's impacts - is a popular concept as growers seek sustainable practices. A final talk which stood out was on offshore shellfish farming by Kevin Heasman from the Cawthron Institute in New Zealand. He talked about advances being made in offshore mussel culture. The Kiwis have been working on this for a few years now and it appears they're getting the kinks worked out.

Bill Dewey
Taylor Shellfish Farms

New Zealand's Oyster Industry Expands

With respect to shellfish aquaculture, New Zealand is best known for the production of the green-shell mussel, *Perna canaliculus*. Produced in suspension culture on highly mechanized long-line farms principally in the Marlborough Sounds region of the South Island, mussels have dominated the country's aquaculture production for the last 25 years. In addition to mussels, the commercial shellfish farming sector also produces about 36 million oysters annually – a drop in the bucket compared to the 97,000 tonnes of green-shell mussels produced in 2006.



The New Zealand oyster industry is poised to undergo significant growth in the years ahead as farmed Pacific oysters are cultured in increasing quantities for export markets, mainly in Asia. As an example, a new oyster farming operation (BioMarine) is anticipated for start-up in early 2008 in the remote Kaipara Harbour region on the North Island, 75 km north of the New Zealand capital of Auckland. Kaipara Harbour is relatively large at 1000 sq km with ample tidal exchange with the Tasman Sea. BioMarine's Operations Director, Jim Dollimore has indicated that the New Zealand shellfish industry is experiencing significant growth as the aquaculture sector gears up to produce another of New Zealand's signature clean, green foods – Pacific oysters. Most of the North Island oyster farms are on the relatively populated eastern (Pacific Ocean) coastline either in Mahurangi Harbor area

or on the Coromandel Peninsula further to the south. In recent years, BioMarine has struggled to maintain high water quality for growing oysters in the Mahurangi shellfish region where nonpoint runoff from agricultural activities, septic pollution, and sewage from pleasure boats have contributed to declining water quality over the last decade or so. To maintain production standards and an even supply of product, BioMarine intends to focus its new operation on relaying oysters from this large shellfish farming region, which is subject to increasing pollution pressure, to the Kaipara Harbour for final growout in suspended cages above the seafloor.

Similar to other new shellfish operations in North America, the ecological review of this proposed farm resulted in years of delays and significant reduction in the scale of the project than originally proposed. In this case, research in southern Kaipara Harbour indicated that the project could negatively impact populations of rare tube-building polychaetes and subtidal seagrass beds that shelter juvenile snapper populations. Other concerns included the effects of growing oysters in BST type cages maintained on off-bottom longlines, though tidal currents (up to 60cm/sec) and wind driven surface currents in the area were viewed as adequate to disperse biodeposits produced by the cultured oyster population with minimal negative effects. Shading of seagrass by oyster cages was seen as the principal negative effect and the project was subsequently altered in scope to accommodate this and other impacts.

The new 70 hectare farm is permitted to initiate operations in early 2008 with development of growout systems to be staged over time and monitoring of effects to be completed before subsequent components are added. In terms of economic output, the farm is designed to accommodate 250,000 cages capable of producing up to 36 million oysters each year if BioMarine's other farms can be used as nurseries. This operation alone would represent a doubling of New Zealand's current annual-oyster production. The company also plans to build a new factory in 2009 to process these oysters and steadily increase production over the next decade to result in 100 new processing jobs.

In New Zealand, it has been long recognized that oyster farming is an appealing use of nearshore waters due mainly to the economic benefits associated with marine shellfish farming, a relatively benign activity. The depth of water and current flows in the Kaipara Harbour suggest that other forms of aquaculture such as Turbot farming be considered for the future. There may be potential for polyculture with holothurians and clams under the oyster cages as well. [Some information obtained from an article published in The New Zealand Herald, August 24, 2007].

Joth Davis
Industry Committee

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2008 Shellfish-Farming Calendar

The Massachusetts Aquaculture Association (MAA), a not-for-profit organization, has published a 2008 calendar entitled **A Year in the Life: Cape Cod Shellfish Farming 2008**. You can view the calendar and purchase a copy at www.massaqu.org. A donation of \$12 US plus \$4 for shipping and handling is required, with funds being used to support MAA's activities.



Upcoming Events

Aquaculture America: February 9-12, 2008, Disney's Coronado Springs Resort, Florida. For information visit www.was.org.

National Shellfisheries Association, 100th Annual Meeting: April 6-10, 2008, Westin Hotel, Providence, RI. Registration is now open; deadline for abstract submission is January 31, 2008. For information visit www.shellfish.org.

Benthic Ecology Meeting: April 10-13, 2008, Westin Hotel, Providence, RI. Deadline for early registration and abstract submission is January 31, 2008. For information visit www.benthicecology2008.uconn.edu.

World Aquaculture 2008: May 19-23, 2008, Busan Korea. For information visit www.was.org.

Physiomar 2008, Reproduction, Growth, Bioenergetics, Nutrition and Genetics of Marine Molluscs: September 1-4, 2008, IUEM, Technopole Brest-Iroise in Plouzané, France. Deadline for abstract submission is February 29, 2008; registration opens April 1, 2008. For more information visit www.univ-brest.fr/IUEM/PHYSIOMAR

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late payment of dues.**

In the News

Former NSA Member Rita Colwell Awarded National Medal of Science - Dr. Rita Colwell, Distinguished University Professor at the University of Maryland, College Park, was awarded the National Medal of Science by the President on July 27, 2007. The Medal is awarded to individuals "deserving of special recognition by reason of their outstanding contributions to knowledge in the physical, biological, mathematical, or engineering sciences," and was updated by Congress in 1980 to include social and behavioral sciences.

From 1998 to 2004 Dr. Rita Colwell served as the 11th Director of the National Science Foundation (NSF). Under Dr. Colwell's leadership, the National Science Foundation budget grew by over 68 percent, surpassing US\$5 billion for the first time in 2003, and the agency was recognized for excellence in both science and management. Dr. Colwell holds a B.S. in Bacteriology and an M.S. in Genetics from Purdue University, and a Ph.D. in Oceanography from the University of Washington.

Metamorphosis

Dr. Hélène Hégarret received her PhD in Oceanography from the University of Connecticut, Department of Marine Sciences under the guidance of Drs. Sandy Shumay and Gary Wikfors (NMFS, Millford). Hélène is now off to the Universidad de Los Lagos, Chile to work on harmful algae off the southern Chilean coast, funded by a post-doctoral fellowship from the French Ministry of Foreign and International Affairs. Congratulations Hélène!

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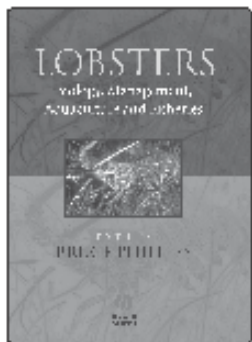
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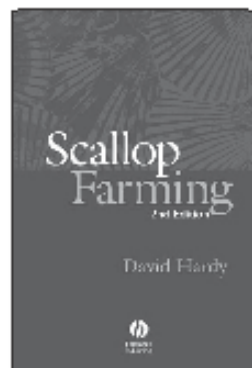
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