

National Shellfisheries Association

QUARTERLY NEWSLETTER



Winter 1999

ST. JOHN'S, NEWFOUNDLAND

President's Message

This is the last of my messages from the President's office. The next time I write it will be from the Past President's office and then maybe from Audit-Budget-Finance again. But I shouldn't get ahead of myself.

During the past year progress has been made on several important issues. Although I had little to do with any of these efforts, I am happy to be associated with the people who did. Karolyn Mueller Hansen and Scott Siddall have continued to build the website into an extremely valuable tool and they're not finished yet. I suspect the site will continue to grow and change for some time to come. Scott has looked at a large number of software packages for management of small associations like NSA, but he has also spent many hours rewriting our present software to fix certain problems, not the least of which is the Y2k bug. These fixes will allow us to take a little more time getting new software and puts off spending \$10-12 thousand for it until later.

Roger Newell, Mel Carriker, Roger Mann and John Kraeuter served well in organizing and reviewing ten applications for the first Melbourne R. Carriker Student Research award. The winner was Rondi Butler who is a student at the University of Maryland, Center for Environmental Studies, Chesapeake Biological Laboratory. Her award will help buy supplies for her project entitled "Investigation into a relationship between MT gene expression and the immunotoxicity of cadmium in hemocytes from the Eastern oyster, *Crassostrea virginica*". I hope that she will be able to present some of her research at a future NSA meeting.

Since this is the last newsletter before the Halifax meeting I want to remind those of you who didn't submit abstracts that you should still attend and enjoy the meeting. There will be lots to do. Evan has come up with a great program (see related section), and Jay Parsons has a terrific time planned for us (also see meeting information). Three award winners (John Ryther, Honored Life Member; Brian Bayne, Honored Life Member; Jay Andrews, Wallace Award) have been invited to attend and speak to us.

Roger Newell has put together a slate of candidates for office for the next year. Ballots will be sent out separately. It is important that you vote; it only takes a minute. Please fill out and return your ballot the day you receive it to President Elect Rick DeVoe.

Lastly, I would like to thank all the people who work at making the National Shellfisheries Association a success. This includes, but is not limited to, *Journal of Shellfish Research* editor Sandy Shumway, *NSA Newsletter* editor Jay Parsons, Program Chair and Vice President Evan Ward, Treasurer Dan Kreeger, Secretary Kim Harrison, webmasters Hansen and Siddall and all the committee chairs and members. Without the efforts of these people and those that served before them NSA would not exist as it is. DON'T FORGET HALIFAX. See you there.

George Abbe
President



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NSA Pacific Coast Section

Update

The Pacific Coast Section of NSA held its annual meeting and convention in conjunction with the Pacific Coast oyster Grower's Association (PCOGA) and the BC Shellfish Grower's Association in Nanaimo, BC, Canada in mid October, 1998. The meeting was attended by 40 of our 161 members. The shellfish meeting as a whole had a focus on intensification and diversification in shellfish culture, as well as a session on politics and environmental issues facing the shellfish industry on the Pacific coast.

In addition, a session was organized by the Pacific Shellfish Institute, the research arm of the PCOGA, to query the shellfish industry with respect to research interests and direction over the next decade. Industry members, scientists and resource managers from the United States and Canada discussed current problems and emerging opportunities on a variety of topics including: genetic improvement programs (selective breeding work; polyploidy and hybridization), new species development (larval and nursery research), carrying capacity studies (modeling bivalve feeding in various kinds of production systems), the regulatory climate, environmental impacts of shellfish culture, interactions with juvenile and adult salmonids in critical estuarine habitat and some others. The bottom line was that the industry was able to engage with ongoing research and scientists had the opportunity to listen to industry and their needs.

The technical meetings were also well attended over the three day meeting. Among nineteen papers, ten students presented their research on a variety of topics. Winning the best student presentation was an undergraduate at Western Washington University, Ms. Janel L. Banks. The paper, entitled "Settlement behavior of dungeness crab, *Cancer majister*, megalope when exposed to chemical and visual cues from the shore crab, *Hemigrapsus*" was co-authored by Dr. Paul A Dinnel. Ms. Banks received a \$100.00 award from the Pacific Coast Section and a one year membership to NSA for her excellent presentation.

Officers of the Pacific Coast Section were retained as a group for another year, and plans are underway for the October, 1999 joint meeting with the PCOGA somewhere on the Washington coast.

Joth Davis
Pacific Coast Section

NSA Election

NSA members should have received their ballots for the 1999 Election by now. Please take a moment to complete the form and return it to President Elect Rick DeVoe at South Carolina Sea Grant Consortium, 287 Meeting Street, Charleston, SC 29401.

Judges Wanted!

Maureen Krause and Aswani Voley report that twenty-seven students will be competing for student presentation awards at the Halifax meeting, and twenty-six students have applied for Student Endowment awards. Judging for travel awards is currently underway, and all applicants will be notified of the results shortly. Strong student participation is encouraging and speaks well for the future of NSA, but it also means that we will need help in judging all of these presentations! If you are willing to lend a hand, please contact either Aswani Voley or Maureen Krause at the addresses listed on the back page.

AUCTION

Spring cleaning? Unwanted Christmas presents? It's time to contribute to the next
**ANNUAL AUDACIOUS ACTION-PACKED
AUCTION**
to benefit the STUDENT ENDOWMENT FUND.

Donations of just about any new or used shellfish-related items will be accepted. These include, but are not limited to: books & other publications (historically important reprints), home brews and vintages, jewelry, artwork, and, of course, t-shirts and other articles of clothing. Please bring items with you to the NSA'99 meeting in Halifax, Nova Scotia.



Industry Update

As we near the year 2000, it may be appropriate to initiate discussion about the status of the shellfish industry today and how the National Shellfisheries Association and research conducted by its membership might interact with the shellfish industry in the future. Based on the present and looking ahead, it is clear that the challenges to the shellfish industry are increasing on a seemingly daily basis. Trying to predict the future is of course difficult if not impossible, but I wanted to try and utilize this column to try and stimulate discussion, perhaps at the upcoming NSA meeting in Halifax, to approach the question of how can research help solve problems as well as help capitalize on opportunities within the shellfish industry today and into the 21st century.

One does not need to be engaged in almost any aspect of the shellfish industry to recognize that significant challenges confront the industry in most parts of the United States and Canada, as well as in much of the developed world where human populations compete for space and resources in near-shore marine environments.

By way of example, the Pacific coast molluscan shellfish industry has been challenged by a litany of problems, which I believe, are symptomatic of issues confronting the industry worldwide. Moving from south to north, Tomales Bay, California shellfish growers have been hurt by the invasion of the green crab from San Francisco Bay, pervasive closures due to high fecal coliform counts and other non-point sources of contamination, and significant oyster seed and adult mortalities during the summer months. Oyster growers in Humboldt Bay, CA face significant loss of oysters grown on the bottom to bat ray predation. Due to a recent 1997 ban on depredation trawling for rays coupled with environmental concerns over suction dredging in eelgrass beds, growers have turned to off bottom methods for grow out which has proved expensive for growing product for the shucked oyster markets.

The concerns over green crab invasions into estuaries further north in Oregon and Washington have spawned significant regulatory constraints over transport of seed oysters and adults from California estuaries northward, and a recent discovery of a haplosporidian in an oyster originating from a Washington State estuary and held in Yaquina Bay, Oregon have further stalled the movement of seed and adult oysters within the region. Constraints on the movement of brood stock and seed oysters have significant implications with respect to ongoing research efforts. The Molluscan Broodstock Program and Western Regional Aquaculture Center (WRAC) funded research centered at the Bodega Marine Lab, Bodega Bay, CA have implicit in their respective efforts the requirement to ship both seed and brood stock animals to industry grow out sites up and down the Pacific coast. In the case of the WRAC brood stock oysters, it has been impossible to attain interstate transport

of brood stock oysters from growing waters in California to growing waters in Washington State when needed in order to accomplish funded research efforts over the last two years.

In Washington State where the majority of the US west coast industry exists, pervasive problems in the late summer with *Vibrio parahaemolyticus* and PSP have forced closures within different segments of the industry for increasing periods. The PSP closures are particularly worrisome as some of the highest levels of PSP toxin ever recorded are being observed in southern Puget Sound as late as November and December the last two years. This, in addition to an apparent expansion of the range of PSP affected molluscs into areas not normally associated with closures, have had significant impacts on the industry. These issues along with industry concerns over the potential impact to estuarine shellfish operations due to the imminent ESA listing of some Puget Sound salmonids, the ongoing occurrences and threat of shellfish bed closures due to failing septic systems and other non-point pollution sources, sporadic but ongoing mortalities of adult Pacific oysters during the summer months in important southern Puget Sound grow out bays and the uncertainty due to unresolved tribal harvesting rights on private tidelands have combined to constrain parts of the industry here in recent years.

The news is not all bad, and at least in the Pacific Northwest, Pacific oyster and Manila clam harvesting in much of the region remains healthy when not affected by seasonal closures, and a recent focus by some growers on the potential of geoduck clam culture have helped retain interest and enthusiasm within the industry about the future.

The question remains, however whether research efforts at current funding levels on a national basis can effectively contribute to solutions to regional problems. There are very often significant political considerations in decision making and problem solving which often fall outside the realm of traditional research projects. For example, the development of unique genetic stocks of shellfish is ongoing at several larger laboratories nationally involving both oysters and hard clams, however it is not yet clear how the industry will be able to utilize these stocks if constraints develop relating to the transport of brood stock, seed or even gametes from improved stocks. The question of outplants of "improved" stocks of shellfish is also raising eyebrows due to the potential for impacting the genetic constitution of native stocks of shellfish, and for most shellfish growing regions within the United States, the ongoing problems with regional closures due to pollution and noxious phytoplankton and losses due to shellfish diseases remain daunting.

Finally, how can a traditionally strong interest by NSA affiliated scientists and members in the shellfish industry contribute to

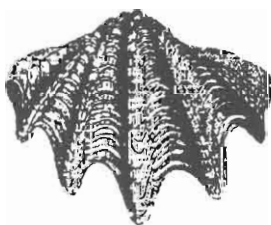
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solutions to both ongoing problems and issues, but also to emerging opportunities? The proliferation of aquaculture meetings is an increasingly difficult problem for NSA as the NSA has the reputation within the industry of being primarily an academic society and as a society we have to find ways to integrate with the shellfish culture community if there is interest in retaining an industry base (this is a perennial problem). Much of the shellfish industry attend meetings for the camaraderie, applied talks and trade shows, and many are not particularly interested on pure or even applied research, even when that very research may hold the most promise for long term gains and solutions to stubborn problems. The proliferation of regional shellfish exchanges, the growth of the World Aquaculture Society and Aquaculture Association of Canada are examples where the focus of these organizations, their annual meetings and journals are largely focused on industry interests, and may tend to dilute the role of NSA in relating to industry problems and opportunities.

The question therefore remains of how NSA can remain an integral asset to both commercial interests, resource agency efforts in shellfish restoration and other stakeholders users in both aquaculture and wild fisheries. Perhaps, one ingredient to NSA's success in retaining industry interest is to focus on the positive role pure and applied research has in agricultural and other resource dominated fields. The ability of land-based agricultural sciences to attract and retain research scientists in both academia and industry may not solely be due to the greater dollar value of traditional agriculture, but may also be related to better defined needs and roles of research science in agriculture. Perhaps there is the need to attempt to better define research goals in shellfish culture and shellfisheries to enable industry to become more engaged and otherwise endorse NSA's efforts in the future. The role of applied and pure research in agricultural genetics, nutrition and husbandry practices are undeniably important, and a similar approach could be used to better define the role of research in shellfish aquaculture and shellfisheries in trying to engage and hold the attention of aquaculturists, resource managers and others involved in culture and restoration efforts.

Joel Davis
Industry Committee



NSA History

Dr. Melbourne Carriker, NSA Historian, is compiling a history of the National Shellfisheries Association. Mel is asking for any material or information relevant to past people, meeting places, and activities. In particular old programs, reports (published and informal), papers and letters related to NSA historical activities. Material on the interaction between NSA and OGDAs would be especially welcome. Please contact Dr. Carriker at phone 302-645-4274 or send material directly to Dr. Melbourne R. Carriker, College of Marine Studies, University of Delaware, Lewes, DE 19958.

Metamorphoses

- We are sorry to report that **Gene Cronin** died recently. A full *in memoriam* will appear in the *Journal of Shellfish Research* in the spring.



Sandy Shumway's Annual Anticipated Audacious Action- packed Auction to Benefit the Student Endowment Fund

The NSA student auction is always one of the highlights of the annual meeting. But we depend on you to bring items for auction to raise money for the Endowment Fund. The Fund helps assist students with travel costs related to the annual meeting.

Please bring items along with you to the NSA'99 meeting in Halifax!

Journal of Shellfish Research

Dr. Sandra Shumway, Editor, *JSR* is looking for volunteers to review papers submitted to the *Journal of Shellfish Research*. If you are interested in helping out and can provide timely reviews, please contact Sandy at the address on the back page.

1999 Annual Meeting

Registration for Halifax Meeting

This newsletter contains the complete program, registration form and travel and hotel information for persons wishing to attend the NSA '99 in Halifax, Nova Scotia, Canada from April 18-22, 1999. In order to receive the lowest registration rates, your forms must be received by April 1, 1999. I would also encourage you to book your room at the Westin Nova Scotian Hotel early and be sure to identify yourself as an NSA meeting participant when you call. Detailed information about the hotel and travel arrangements is provided elsewhere on this page.

Hotel Reservation Information

There is a large block of rooms at the Westin Nova Scotian Hotel at a special conference rate of CDN \$99 for single or double occupancy (does not include taxes of 15%). For students and others wanting to share a room, 3 people are allowed to stay in one room, also at a rate of CDN \$99 per room. Please make your hotel reservations as soon as possible by calling the hotel directly at **1-888-679-3784** or local 1-902-421-1000. Please be sure to mention that you are attending the National Shellfisheries Association annual meeting.

Travel Arrangements

The Halifax International Airport is served by major airlines (Air Canada, Canadian Air and their regional and international partners). "Flights to Sites" offer discounted fares on all major carriers to NSA conference attendees. They can be reached at phone **1-800-609-0439**. Please identify yourself as an attendee of the National Shellfisheries Association - Halifax meeting. "Flights to Sites" can also arrange for car rentals.

The airport is located about 30 minutes from downtown Halifax. There is a hotel bus shuttle service (CDN \$12 one-way / \$20 return), as well as taxi (CDN \$35.65) and limo service (CDN \$37.95). All major car rental agencies are located at the airport (e.g., Avis, Hertz, Budget, etc.). There is also parking behind the Westin Nova Scotian Hotel at a rate of CDN\$4 per day.

Local Attractions

To obtain travel/tourist information on Halifax or Nova Scotia, you can contact any of the following agencies.

Tourism Halifax: <http://www.halifaxinfo.com>

Tourism Nova Scotia: <http://explore.gov.ns.ca/virtualns/> or phone 1-800-565-0000.

Tours

Tours of the National Research Council's Institute of Marine Biosciences Laboratory and their Sandy Cove Aquaculture Facility are planned. People can sign up for these tours at the on-site NSA registration desk at the Westin Hotel.

Oral and Poster Presentations

There will be slide projectors, overheads projectors and data projectors for power point presentations available in each of the meeting rooms. For poster presentations, poster boards measuring about 4 feet wide by 3 feet high will be available. You can use *Velcro* tape to affix posters to the board.

Ken Chew's Annual Chinese Dinner

Ken Chew's Annual Chinese Dinner will once again be held in Halifax, Nova Scotia at the NSA '99 meeting. It will be held on Monday April 19, 1999. Tickets can be purchased at the meeting when you pick up your registration package. Details on cost and location will also be provided on-site. This is always a very popular event, so buy your tickets early so you don't miss out!

President's Reception

The President Reception will be held on Sunday evening at 7 p.m. in the Atlantic Ballroom. This event is being sponsored by the **Nova Scotia Department of Fisheries and Aquaculture**. The reception will feature a number of delicious shellfish products from the fishery and aquaculture sector of Nova Scotia and the Maritimes region. We will be very fortunate to have **Mr. Keith Colwell**, Minister of the Nova Scotia Department of Fisheries and Aquaculture present at the reception to welcome NSA '99 delegates to Nova Scotia.

National Shellfisheries Association 1999 Annual Meeting
April 18 - 22, 1999, Halifax, Nova Scotia, Canada
Registration Form

Please complete a copy of this form for each person registering and mail to:

Dr. Jay Parsons
P. O. Box 4920
Aquaculture, School of Fisheries
Marine Institute of Memorial University
St. John's, NF Canada A1C 5R3

Mailing Information:

Name: _____
Organization: _____
Mailing Address : _____
City: _____ State/Prov.: _____ Zip: _____
Country: _____ phone: _____ email: _____

Name Badge Information (max. 25 characters for each line):

Name: _____
Organization: _____

NSA Registration

Fees include entry into all technical sessions, all coffee and refreshment breaks, President's Reception on Sunday evening (hors d'oeuvres), Monday lunch buffet, student reception and auction (hors d'oeuvres, beer, wine) on Tuesday evening, and the buffet Business Luncheon on Wednesday.

	<u>By April 1</u>	<u>After April 1</u>	<u>Total \$</u>
NSA Members	US \$150	US \$200	\$ _____
Student members	US \$115	US \$145	\$ _____
Non-Members	US \$200	US \$250	\$ _____
Daily Registration	US \$75	US \$75	\$ _____
NSA Membership	Regular: US \$45 Student: US \$25		\$ _____
<u>Additional Tickets for Activities</u>		<u>Per ticket</u>	
President's Reception		US \$25	\$ _____
Student's Reception/Auction		US \$20	\$ _____
Buffet Business Luncheon		US \$20	\$ _____

Total Fees enclosed US \$ _____

Name on credit card _____ Signature _____
Number _____ Circle type of card **VISA MASTERCARD**
Expiration Date _____ (only ones accepted)

N.B. PAYMENT MUST BE IN US DOLLARS

Please mail a copy of this registration form, credit card information (above), or a US check (MUST be drawn on a US bank) or money order made payable to NSA '99 to the address given above. Federal ID number for NSA is 52-1128190. Registrants paying by credit card can fax the registration form to Jay Parsons at 1-709-778-0535. Questions concerning registration should be directed to Jay Parsons (address on back).

National Shellfisheries Association
91st Annual Meeting
The Westin Nova Scotian — Halifax, Nova Scotia, Canada
April 18 to 22, 1999

ACTIVITIES SCHEDULE

SUNDAY, April 18, 1999

1:00-6:00	Maritime Room	EXCOM Meeting
3:00-7:00	Coat-check Room	Registration
7:00-11:00	Atlantic Ballroom	President's Reception

MONDAY, April 19, 1999

8:00-2:00	Coat-check Room	Registration
8:20-9:00	Commonwealth A	Plenary Session
9:00-10:00	Commonwealth A	Lobster Ecology & Fisheries
	Atlantic Ballroom	Biology & Morphology of Shellfish
10:00	BREAK	
10:20-11:40	Commonwealth A	Lobster Ecology & Fisheries (cont.)
	Atlantic Ballroom	Biology & Morphology of Shellfish (cont.)
11:40	Commonwealth B	Poster Session with Authors
12:30	Atlantic Foyer	Buffet Lunch
1:20-3:00	Commonwealth A	Feeding Physiology & Ecology of Bivalves
	Atlantic Ballroom	Shellfish-Microbial Interactions
3:00	BREAK	
3:20-5:00	Commonwealth A	Feeding Physiology & Ecology (cont.)
	Atlantic Ballroom	Shellfish-Microbial Interactions (cont.)
7:00-10:00	Ken Chew's Annual Chinese Banquet. Tickets & information available at Registration desk.	

TUESDAY, April 20, 1999

8:00-2:00	Coat-check Room	Registration
8:20-10:00	Commonwealth A	Shellfish Immunology
	Atlantic Ballroom	Scallop Fisheries
10:00	BREAK	
10:20-	Commonwealth A	Shellfish Immunology (cont.)
12:00	Atlantic Ballroom	Scallop Fisheries (cont.)
12:00	LUNCH	
1:20-3:00	Commonwealth A	Shellfish Industry & Research Forum
	Atlantic Ballroom	Scallop Fisheries (cont.); Genetics & Molecular Biology
3:00	BREAK	
3:20-4:20	Commonwealth A	Shellfish Industry/Research Forum (cont.)
	Atlantic Ballroom	Genetics & Molecular Biology (cont.)
4:20	Commonwealth B	Poster Session with Authors

TUESDAY, April 20, 1999 con't

5:00 pm	Commonwealth Foyer	Poster Session Reception
7:00-11:00	Sandy Shumway's Annual Action-packed Auction in Aid of the Student Endowment Fund (Atlantic Ballroom)	

WEDNESDAY, April 21, 1999

8:00-2:00	Coat-check Room	Registration
8:20-10:00	Commonwealth A	Cold Water Aquaculture Health
	Atlantic Ballroom	Reproduction & Recruitment
10:00	BREAK	
10:20-	Commonwealth A	Cold Water Aquaculture Health (cont.)
12:00	Atlantic Ballroom	Growth & Culture of Shellfish I
12:00	Commonwealth A	LUNCH & Annual NSA Business Meeting
2:00-3:40	Commonwealth A	Cold Water Aquaculture Health (cont.); Shellfish Disease I
	Atlantic Ballroom	Modelling Shellfish Ecosystems
3:40	BREAK	
4:00-5:20	Commonwealth A	Shellfish Disease I (cont.)
	Atlantic Ballroom	Modelling Shellfish Ecosystems (cont.)

THURSDAY, April 22, 1999

8:30-10:00	Coat-check Room	Registration
8:30-9:00	Commonwealth A	Announcement of Nelson & Poster Awards
9:00-10:20	Commonwealth A	Shellfish Disease II
	Atlantic Ballroom	Growth & Culture of Shellfish II
10:20	BREAK	
10:40-12:00	Commonwealth A	Shellfish Biochemistry
	Atlantic Ballroom	Growth & Culture of Shellfish II (cont.)

NSA Meeting Closes at Noon

Notes: 1. All breaks will be held in the Commonwealth & Atlantic Foyers. 2. Posters will be available for viewing during the entire meeting in Commonwealth Room B. There will be a special poster session Monday morning starting at 11:40, and Tuesday afternoon starting at 4:20 when presenters will be available to answer questions and discuss their research. 3. Posters should be removed by Noon on Thursday.

MONDAY MORNING APRIL 19, 1999

Plenary Session Commonwealth Room A Chair: Evan Ward		
Time		
8:20	Plenary Session:	
8:40	Plenary Session (cont.)	
	Lobster Ecology & Fisheries Commonwealth Room A Chair: John Tremblay	Biology & Morphology of Shellfish Atlantic Ballroom Chair: Andrew Boghen
9:00	Lobster movement in southern Gulf of St. Lawrence. COMEAU*, LANTEIGNE, ROBICHAUD, SAVOIE	Abfrontal surface of bivalve gills. DUFOUR*†, BENINGER
9:20	Ultrasonic tracking of lobsters. TREMBLAY*, DUGGAN, O'DOR, CURTIS, WEBBER, ANDRADE	Presence of <i>U. cyprinae</i> on the gills of oysters. BRUN*†, BOGHEN, ALLARD
9:40	Thermoregulation and movement of lobsters. JURY*, HOWELL, WATSON	Free amino acid changes in diseased crustaceans. STENTIFORD*†, NEIL, COOMBS
10:00	BREAK	
10:20	Spatial scaling of lobster distributions. RANGELEY*, LAWTON	Temperature effects on lobster heart activity. SCHRIEBER*†, KRULL, JURY, WATSON
10:40	Lipid condition in lobster larvae. HARDING*, FRASER	Mechanical properties of <i>M. edulis</i> shells. MCDUFFEE*†, DAVIDSON, IRELAND
11:00	Lobster commercial catch composition fluctuations. LANTEIGNE*	Morphologies of archaeological and modern bay scallops. MARELLI*, ARNOLD
11:20	Management target for lobster fisheries. MILLER*, DRINKWATER	<i>Rapana</i> habitat and prey preferences. HARDING*†, MANN
11:40	POSTER SESSION & BUFFET LUNCH	

MONDAY AFTERNOON APRIL 19, 1999

Feeding Physiology & Ecology of Bivalves Commonwealth Room A Chairs: Bruce MacDonald & Evan Ward		
Time		
1:40	Pseudofeces rejection in bivalves. BENINGER*, VENIOT	Shellfish-Microbial Interactions Atlantic Ballroom Chairs: Fred Genthner & Aswani Volety Regulation and management of water quality. OLIN*, LANGLOIS
2:00	Composite cilia in bivalves. VENIOT*†, BENINGER	Bacteria killing by oyster hemocytes. GENTHNER*, VOLETY, OLIVER, FISHER
2:20	Particle selection on bivalve gills. BAKER*, LEVINTON, WARD	Susceptibility of <i>Vibrio parahaemolyticus</i> to oyster hemocytes. VOLETY*, GENTHNER, FISHER, MCCARTHY, WILES
2:40	Particle aggregates and suspension feeding. GRANT*, NICKERSON	<i>Vibrio fluvialis</i> in American lobsters. TALL* et al.
3:00	Challenges of examining postingestive selection in bivalves. BRILLANT*†, MACDONALD	<i>Vibrio vulnificus</i> in diploid and triploid eastern oysters. LA PEYRE*, COOPER, SUPAN, VOLETY
3:20	BREAK	
3:40	Feeding and secondary metabolites of detrital particles. WARD*, LEVINTON, SHUMWAY	Detection of protozoa in the eastern oyster. STOWELL*†, TOROSIAN, MARGOLIN
4:00	Seasonality of bivalve feeding and digestion. CRANFORD*	<i>In vivo</i> transfection of adult oysters. BUCHANAN*†, CHENG, LA PEYRE, COOPER, TIERSCH
4:20	Comparative feeding physiology in blue mussels. MOONEY*†, PARSONS, COUTURIER	Partial culture of <i>Hematodinium perezii</i> . SHIELDS*, SQUYARS
4:40	Mussel filtration rate: current and food concentration. NEWELL*†	Discussion & Questions
5:00	Role of oysters in maintaining water quality. NEWELL*, CORNWELL, OWENS, TUTTLE	
	OPTIONAL - KEN CHEW'S FAMOUS CHINESE BANQUET	

* Denotes presenting author. † Denotes that presenter is a student eligible for the Nelson Award.

TUESDAY MORNING APRIL 20, 1999

Time	Shellfish Immunology Commonwealth Room A Chairs: Robert Anderson & Cal Baier-Anderson	Scallop Fisheries Atlantic Ballroom Chair: Ellen Kenchington
8:20	Phagosomal mechanisms in oyster blood cells. PAYNTER*	Early life history dynamics of sea scallops. ROBINSON*, MARTIN, CHANDLER, PARSONS
8:40	Eastern oyster hemocyte bactericidal activity. BRAMBLE*†, ANDERSON	Effects of dispersed bitumen on scallops. ARMSWORTHY*, CRANFORD, LEE
9:00	Effects of hypoxia on cellular defenses. BURNETT*, BOYD, MILARDO, MIKULSKI, WILSON, BURNETT	Modelling effects of drilling wastes on scallops. CRANFORD*, GORDON, HANNAH, LODER, MILLIGAN, MUSCHENHEIM
9:20	Influence of season on hemocyte responses. VOLETY*, WINSTEAD, FISHER	Variables influencing spatial distribution of scallops. STOKESBURY*
9:40	Environmental effects on oysters' cellular/humoral responses. CHU*	Jet-propelled swimming in scallops. DEMONT*
10:00	BREAK	
10:20	Chemical effects on oyster hemocyte microbicidal activity. OLIVER*, VOLETY, FISHER	Scallop gear selectivity and resource management. DUPAUL*, KIRKLEY, RUDDERS
10:40	Xenobiotic-induced immunotoxicity in the pacific oyster. AUFFRET*, OUBELLA	RNA/DNA ratios in scallops. RODDICK*†, KENCHINGTON, SMITH, GRANT
11:00	Protease-antiprotease interactions. FAISAL*	Microsatellite VNTR variation in scallops. KENCHINGTON*, BIRD, ZOUROS
11:20	Modulation of hemocyte activities by <i>Perkinsus</i> <i>marinus</i> . LA PEYRE*, VOLETY	Evaluating scallop enhancement efforts with genetic markers. WILBUR*, ARNOLD, BERT
11:40	Immune response of abalone with withering syndrome. FRIEDMAN*, ROBBINS, JACOBSEN, SHIELDS	Re-introducing Bay scallops into Chincoteague Bay, MD. TARNOWSKI*, HOMER

TUESDAY AFTERNOON APRIL 20, 1999

Time	Shellfish Industry & Research Forum Commonwealth Room A Chair: Jonathan Davis	Scallop Fisheries (cont.) Atlantic Ballroom Chair: Ellen Kenchington
1:20	TBA - see program supplement	Retention of scallop veligers. MANUAL*†
1:40	TBA - see program supplement	Effect of deployment date on scallop growth. LEVY*†, PARSONS, DABINETT
2:00	TBA - see program supplement	Management advice of giant scallop. DAVIDSON*, POUSSART
	Shellfish Industry & Research (cont.) Commonwealth Room A	Bivalve Genetics & Molecular Biology Atlantic Ballroom Chair: Maureen Krause
2:20	TBA - see program supplement	Impact of suspension-culture on heterozygosity of mussels. MYRAND*, TREMBLAY, SÉVIGNY
2:40	TBA - see program supplement	Tetraploid zhikong scallop produced by inhibiting PBI. YANG, GUO*, ZHANG
3:00	BREAK	
3:20	TBA - see program supplement	Molecular characterization of scallop Gpi. KRAUSE*
3:40	TBA - see program supplement	Mosaicism of somatic and gametic tissues in oysters CHANDLER*†, HOWE, ALLEN
4:00	TBA - see program supplement	Reversion of triploid oysters. ALLEN*, HOWE, GALLIVAN, GUO, DEBROSSE
4:20	TBA - see program supplement	RT-PCR with oyster actin gene. CHENG*†, BUCHANAN, LA PEYRE, TIERSCH, COOPER
4:40	POSTER SESSION & RECEPTION	
7:00	ANNUAL STUDENT-ENDOWMENT-FUND AUCTION	

Denotes presenting author. † Denotes that presenter is a student eligible for the Nelson Award.

WEDNESDAY MORNING APRIL 21, 1999

Time	Cold Water Aquaculture Health Commonwealth Room A Chairs: Bruce Barber & Sharon McGladdery	Reproduction & Recruitment Atlantic Ballroom Chair: Shawn Robinson
8:20	Cold water effects on oyster diseases. BOWER, MEYER*	Fall spawning of <i>Argopecten</i> in New York. TETTELBACH*, SMOLOWITZ, SMITH, TETRAULT, DUMAIS
8:40	Impact of <i>Bonamia</i> on cultured <i>Ostrea edulis</i> . CARNEGIE*†, BARBER	Spawning patterns in soft-shell clams. MACLEAN*†, MACNAIR, DAVIDSON, JOHNSON
9:00	QPX in clams from Atlantic Canada. BACON*†, MCGLADDERY, MACDONALD	Larval and post-set distributions of mussels and starfish. PRYOR*†, PARSONS, COUTURIER
9:20	Stress response of oysters. FRIEDMAN*, SHAMSELDIN, PILLAI, OLIN, CHERR, JACKSON, RIFKIN, UHLINGER, CLEGG	Soft-shell clam recruitment in Maine. VASSILIEV*†, CONGLETON, BEAL, FEGLEY
9:40	Association between <i>Urustoma cyprinae</i> and <i>Crassostrea virginica</i> . BOGHEN*, BRUN, BATALLER	Vitellogenesis in the green sea urchin. MCGINN*†, LESSER, WALKER
10:00	BREAK	
	Cold Water Aquaculture Health (cont.) Commonwealth Room A	Growth & Culture of Shellfish I Atlantic Ballroom Chair: Roger Newell
10:20	<i>Proserhynchus squamatus</i> infection of blue mussels, <i>Mytilus edulis</i> . MCGLADDERY*, STEPHENSON, MCARTHUR	Mussel Production in relation to seston flux. MCNEIL*†, COUTURIER
10:40	Distribution of gonadal neoplasms. BARBER*, BACON	Triploid production of <i>Mytilus edulis</i> . BRAKE*†, DAVIDSON, DAVIS
11:00	Cellular defense and resistance in manila clams. ALLAM, ASHTON-ALCOX, FORD*	Location and time on mussel productivity. WAITE*†, LANDRY, DAVIDSON
11:20	Temperature control of brown ring disease. PAILLARD*, ALLAM, OUBELLA, FORD	Mitigating green crab predation. WALTON*†, RUIZ, STARR
11:40	Discussion & Questions	Growth rate of juvenile green sea urchins. KENNEDY*†, ROBINSON, PARSONS
12:00	Banquet & NSA Business Meeting	

POSTER SESSION

- Beaven & Paynter Bafilomycin A1 inhibits acidification of granular and agranular oyster hemocyte phagosomes.
- Brewster, Bushek & Dame An ecosystem model of *Perkinsus marinus*.
- Burton, MacKenzie, Davidson & Fraser Evaluation of a glucose oxidase/peroxidase method for indirect measurement of glycogen content in oysters.
- Cayer, MacNeil & Bagnall Tunicate fouling in Nova Scotia aquaculture: a new development.
- Chandler, Howe & Allen, Jr. Use of flow cytometry and histology to assess gametogenesis in triploid *Crassostrea ariakensis*.
- Coates, Cooper & La Peyre Improvement of the whole-oyster procedure for enumerating *Perkinsus marinus* in oyster tissues.
- Ellin & Bushek Potential use of Ray's Fluid Thioglycollate Medium to detect and quantify *Perkinsus marinus* in environmental water samples.
- Elsayed & Faisal Correlation between the level of protease inhibitors and intensity of *Perkinsus marinus* infection in eastern oyster (*Crassostrea virginica*).
- Feindel, Thompson, Dabinett & Parrish Effects of broodstock and larval diets on lipid and fatty acid composition of sea scallop eggs and larvae.
- Garcia-Esquivel, Gonzalez-Gomez & Gomez-Togo Growth, mortality and biochemical content of the Pacific oyster, *C. gigas*, during spat-adult development.
- Hofmann, Klinck, Ford & Powell Disease dynamics: modeling the effect of climate change on oyster disease.
- Horney, MacKenzie, Cawthorn, Morris, Hammell & MacMillan Reference ranges for chemical & cellular constituents of hemolymph from "healthy" lobsters.
- Jones, Chase, Sowles, Hennigar & Wells Spatial trends for toxic contaminants in *Mytilus edulis* from the Gulf of Maine.
- Koles & Paynter Oyster restoration in Maryland: measuring progress and productivity.
- Leonard III, Gomez-Chiarri & Ganz Detecting the presence of *Perkinsus marinus* in the eastern oyster, *Crassostrea virginica*, in Rhode Island waters.
- MacNair & Smith Investigations into treatments to control fouling organisms affecting oyster production.
- Mazzola, La Rosa, Savona & Sarà Seston dynamics and food availability in a mussel system (Gulf of Gaeta, Southern Tyrrhenian Sea, Italy).
- Milke, Ward & Shumway Effects of food quality on the particle handling time in bivalves.
- Moal, Seguinéau, Samain, Soudant, Cansell, LeCoz, Migaud, Sanles, Ponce & Langdon How to provide essential nutrients to bivalves in hatchery.
- Nadeau, Cliche & Hébert Experimental dredging of starfishes and crabs before commercial seeding of sea scallops in Magdalen Islands (Québec, Canada).
- Ribeiro, Simoes & Swenarchuk Mussel culture potential in southern Mozambique.
- Rice, Valliere, Gibson & Ganz Eutrophication control by bivalves: population filtration, sedimentation and nutrient removal through secondary production.
- Rohledo, Coss & Vasta Development of a PCR-based diagnostic assay for a novel *Perkinsus* species isolated from *M. baltica*.
- Sarà, Romano & Mazzola The new western Mediterranean entry *B. pharaonis*: changes in filtration rate under varying natural food conditions.
- Shields Partial culture and cryopreservation of the parasitic dinoflagellate *Hematodinium perezi* from the blue crab.
- Stentiford, Neil & Atkinson Infection by the dinoflagellate parasite *Hematodinium* in the Norway lobster (*N. norvegicus* L.) on the west coast of Scotland, UK.
- Stokes, Kraus, Burrenson, Ashton-Alcox & Ford Searching for the putative MSX intermediate host using molecular diagnostics.
- Tweed & Guo Preliminary evaluation of triploid eastern oysters, *Crassostrea virginica*, on a mid-Atlantic oyster farm.
- Ziegler & Paynter Proteolytic activity from blood cells of the eastern oyster, *Crassostrea virginica*.

WEDNESDAY AFTERNOON APRIL 21, 1999

Time	Cold Water Aquaculture Health (cont.) Commonwealth Room A Chairs: Bruce Barber & Sharon McGladdery	Modelling Shellfish Ecosystems Atlantic Ballroom Chair: Eileen Hofmann
2:00	Alpha-protobacterium associated with JOD. BOETTCHER*, SINGER, BARBER	<i>Rapana</i> in the Chesapeake Bay. MANN*, HARDING, HAYWOOD
2:20	Mycotic periostacal sloughing. DAVIDSON*, MORRIS, GROMAN	Modelling growth and development of <i>Crassostrea</i> <i>gigas</i> larvae. BOCHENEK*, POWELL, HOFMANN, KLINCK
2:40	Monitoring shellfish health in Newfoundland. MORET*, COUTURIER, PARSONS, WILLIAMS	Modelling population dynamics of pacific oysters. HYUN*†, PANG, CHOI, POWELL, KLINCK, HOFMANN
	Shellfish Disease I Commonwealth Room A Chair: Greg Bacon	Modelling Shellfish Ecosystems (cont.) Atlantic Ballroom
3:00	Integrated monitoring of marine disease and mortality. FISHER*, SHERMAN	A coupled suspension feeder-eutrophication model. MEYERS*, DI TORO, FITZPATRICK
3:20	Withering syndrome in farmed red abalone. MOORE*, ROBBINS, FRIEDMAN	Bayesian approach to shellfish ecosystem modelling. DOWD*, MEYER, THACKER
3:40	BREAK	
4:00	Diversity among <i>Perkinsus marinus</i> isolates. BROWN*†, KOTOB, FAISAL	Modelling resuspension. GRANT*, BACHER
4:20	Trends in <i>Perkinsus</i> infections in the Patuxent. ALBRIGHT*, ABBE	Oysters in the Great Wicomico River. SOUTHWORTH*†, MANN
4:40	rRNA of <i>Perkinsus</i> sp. from <i>M. balthica</i> . COSS*†, ROBLEDO, RUIZ, VASTA	Fertilization success in sea scallops. DUMAIS*, BOESPFLUG, BAUDINET, FRECHETTE
5:00	Plasma inhibitor of <i>Crassostrea</i> spp. OLIVER*†, FAISAL, KAATTARI	Time to critical levels of <i>Perkinsus marinus</i> . SONIAT*, KORTRIGHT, RAY
5:20	Diagnostic multiplex PCR for oyster pathogens. PENNA*†, FRENCH, VOLK, KAROLUS, SUNILA, SMOLOWITZ	Modelling MSX parasite in eastern oyster populations. POWELL*, FORD, HOFMANN, KLINCK

THURSDAY MORNING APRIL 22, 1999

Time	Shellfish Disease II Commonwealth Room A Chair: Bill Fisher	Growth & Culture of Shellfish II Atlantic Ballroom Chair: Mark Luckenbach
8:30	Announcement of Nelson and Poster Award Winners	
9:00	Geographic distribution of <i>P. marinus</i> strains. REECE*, BUSHEK, HUDSON	Effects of <i>Aureococcus anophagefferens</i> on bivalve feeding and growth. BRICELJ*, MACQUARRIE, SMOLOWITZ
9:20	Transmission of <i>Perkinsus marinus</i> . BUSHEK*, ERSKINE, DAME, COEN, HADLEY	Evaluating performance of non-native oysters in Virginia. CALVO*, LUCKENBACH, BURRESON
9:40	Lipid metabolism in <i>Perkinsus marinus</i> . CHU, SOUDANT*, HUANG, VOLETY, CONSTANTIN	Juvenile growth of cage-reared Stimpson's surfclams. DAVIS*
10:00	Long-term survival of <i>Perkinsus marinus</i> cells. SHAHEEN*	Sea lettuce and softshells. MACKENZIE*
10:20	BREAK	
	Shellfish Biochemistry Commonwealth Room A Chair: David Bushek	Growth & Culture of Shellfish II (cont.) Atlantic Ballroom
10:40	Essential fatty acid accumulation by <i>C. gigas</i> broodstock. SOUDANT*, VAN RYCKEGHEM, MOAL, MARTY, SAMAIN, SORGELGOS	Effect of fishing pressure on blue crabs. ABBE*, ALBRIGHT
11:00	Fatty acids and reproduction in two bivalve molluscs. SAMAIN*, SOUDANT, MARTY, MOAL	Survival and growth of juvenile green sea urchins. HAGEN*
11:20	A new fatty acid in pectinids. MARTY*, SOUDANT, PIERROTTE, MOAL, SAMAIN, DUSSAUZE	Success of shellfish restoration. LEONARD*

* Denotes presenting author. † Denotes that presenter is a student eligible for the Nelson Award.

The Melbourne R. Carriker Student Research Grant

NSA is pleased to announce that Ms. Rondi Butler, a Ph.D. graduate student advised by Professor Guri Roesijadi at the Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, was selected to be awarded the first annual Melbourne R. Carriker Student Research Grant. The title of Ms. Butler's grant proposal was "Investigation into a relationship between MT gene expression and the immunotoxicity of cadmium in hemocytes from the eastern oyster *Crassostrea virginica*." This grant is named in honor of Professor Carriker who is one of the Society's most distinguished past-Presidents. This is a competitive grant program which awards an NSA student member a \$1,000 grant for non-travel related expenses associated with undertaking their Master's thesis or Ph.D. dissertation research. Although there were only a total of ten applications in this first year the quality of each application was extremely high. Interestingly, there was little affect on whether the student was a M.S. or Ph.D. student on the committees ranking of the proposals. Students had uniformly presented clear and concise proposals, which bodes well for the future of Shellfisheries Science.

I would like to thank the review committee consisting of the following NSA Past Presidents, Drs. Mel Carriker, John Kraeuter, and Roger Mann for the difficult task of evaluating the proposals. I actually did not participate in the review process because students from my institution, including one of my students, submitted applications. There will be another opportunity for students to request funding for their graduate research in the summer of 1999. George Abbe will be in charge of the review process and he will put an announcement in the *NSA Newsletter* nearer the time.

Roger Newell, Past President

Recruits Corner

It's typical for the author of a pre-annual meeting Recruits column to encourage student members attending the upcoming meeting to help out at the registration desk and merchandise table—the proceeds of which go to a very good cause, the Student Endowment Fund—and to say that he/she is looking forward to seeing all the other student members at the meeting. So as not to break with a long tradition, I'll dispatch with this first: The 1999 meeting in Halifax is just around the corner, and is sure to be a great event—I look forward to seeing many of you there. And I hope many of you will volunteer to help out at the merchandise table—the proceeds of this booth make attending an NSA meeting affordable to many students for whom it otherwise might not be.

I thought I'd take the opportunity to bring up a couple of other items. The first regards the *NSA Newsletter's* Metamorphosis column. Little has appeared concerning our student members in recent months. If you're graduating and moving on to a new job, or beginning a new degree program—or if you have a student who's making such a transition—drop a note to Jay Parsons at the address on the back of the newsletter, or to me at the address below. We'd all like to hear about it!

Second, I thought I'd make a pitch for material for future Recruits columns. Is there a short list of shellfishy web sites that you find particularly useful and visit regularly that you might like to pass on to the other student members? Or is there an innovative technique or hot new gear item you're using in your research that you've just got to tell someone about? Tell us, so we can pass it along in an upcoming newsletter.

Feel free to contact me with any comments or suggestions at the address below. I look forward to seeing you in Halifax!

Ryan Carnegie
ryan.carnegie@umit.maine.edu

Visit the NSA Web Site for the latest updates

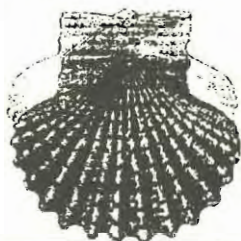
<http://www.shellfish.org>

From the Newsletter Editor...

This newsletter contains the registration information for the NSA'99 Annual meeting in Halifax, Nova Scotia. Please note the early bird registration date of April 1, 1999.

Improvements continue on the NSA web site. Karolyn Mueller-Hansen is in the midst of creating a searchable database for JSR. She is also developing a clickable "map" page for the site which will be a guide to shellfish/aquatic resources by geographical region (US and Canada to start; rest of world to be added later). Any members who have suggestions for links to sites in their regions can send the information to Karolyn via news@shellfish.org.

Jay Parsons



New Home Page Address

World Aquaculture Society

The WAS now has a new URL: www.was.org. Check out the new changes and new features!

New England Estuarine Research Society

NEERS now has a new webpage at www.NEERS.org.

Recruited by? _____

How to Join the National Shellfisheries Association

Fill out and mail a copy of the application blank below. The dues are US \$45.00 per year (\$25.00 for students) which may be paid by credit card, check, or money order. Membership entitles you to receive *The Journal of Shellfish Research* and the *Quarterly Newsletter*!

NATIONAL SHELLFISHERIES ASSOCIATION - APPLICATION FOR MEMBERSHIP (NEW MEMBERS ONLY)

Name: _____ For Calendar Year: _____ Date: _____

Mailing Address: _____

Institutional Affiliation, if any: _____

Phone: _____ Fax: _____ Email: _____

Shellfisheries interests: _____

Regular or Student membership? _____

Student members only - Advisor's signature REQUIRED

If paying by credit card: Type of card: VISA MASTERCARD (circle one)

Name on card: _____ Signature: _____

Expiration Date: _____ Number: _____

Make checks (MUST be drawn on a US bank) or international postal money order for \$45.00 (\$25.00 for students with advisor's signature) payable to the National Shellfisheries Association and send to Ms. Nancy C. Lewis, NSA Bookkeeper, P.O. Box 350, VIMS Eastern Shore Lab, Wachapreague, VA 23480 USA.

Upcoming Meetings

19th Milford Aquaculture Seminar: February 22-24, 1999, Quality Inn Conference Center, New Haven, CT. Deadline for abstracts January 6, 1999. For more information contact Walter Blogoslawski, NMFS, Milford Laboratory, Milford, CT, phone (203) 783-4217 or email walter.blogoslawski@noaa.gov.

International Symposium on Geographic Information Systems (GIS) in Fishery Sciences: March 2-4, 1999, Seattle, Washington, USA. Participation of a broad audience representing GIS applications in fisheries sciences are encouraged, i.e., scientists, students, computer experts, managers, administrators, and educators. For more information contact Fishery GIS Research Group, c/o Environmental Simulation Laboratory, 2F, Noble Build., 2-4-1 Arajuku, Kawagoe, Saitama, Japan 350-1124, phone 81 (Japan) -492-42-9262, fax 81 (Japan) -492-41-2442, email esl@esl.co.jp, or website <http://www.esl.co.jp/>.

The Great Atlantic Shellfish Exchange: April 15-17, 1999, Prince Edward Hotel, Charlottetown, PEI, Canada. For general information on the Exchange contact the PEI Aquaculture Alliance at phone (902) 368-2757, fax: (902) 368-3958, email: peiaqua@pei.sympatico.ca. For Trade show information or to pre-register contact Atlantic Fish Farming at phone (902) 838-2515, fax: (902) 838-4392, email: pmacneill@pei.sympatico.ca. For Hotel Reservations contact the Prince Edward Hotel at (902) 566-2222 (or 1-800-441-1414; be sure to mention the Exchange to get the special room rate of \$79.00).

National Shellfisheries Association 91st Annual Meeting: April 18-22, 1999, The Westin Nova Scotian, Halifax, Nova Scotia, Canada. For program information contact Dr. Evan Ward and for local arrangements and registration, contact Dr. Jay Parsons (addresses on back page).

Tenth International Symposium on Pollutant Responses In Marine Organisms: April 26-30, 1999, Williamsburg, Virginia. For more information contact Dr. Mohamed Faisal, PRIMO 10, phone 804-684-7231, fax 804-642-7186, email faisal@vims.edu.

12th International Pectinid Workshop: May 5-12, 1999, Bergen, Norway. Preregister by contacting: Mr. Gunnar Eiken, 12th IPW, Local Organizing Committee, Hordaland Fylkeskommune, N-5020 Bergen, Norway (Tel: +47 56 55 53 33; Fax: +47 55 23 93 16; E-mail: gunnarek@online.no). The closing date for submission of abstracts will be 1 Feb 1999. Suggestions regarding the scientific programme should be directed to: Dr Øivind Strand, Chairman of the Scientific Committee, Institute of Marine Research, P. O. Box 1870, Nordnes, N-5024, Bergen, Norway (Tel: +47 55 23 83 13; Fax: +47 55 23 83 33; email: oivind.strand@imr.no).

65th American Malacological Union Meeting: July 4-9, 1999, Sheraton Station Square, Pittsburgh, Pennsylvania, U.S.A. AMU '99 will have a wide array of programs for malacologists, conchologists, shellfishery biologists, and educators. For more information contact Bob Prezant email rprezant@grove.iup.edu, phone (724)357-2352 (up to January 5, 1999) or robert_prezant@qc.edu or phone (718)997-4105 (after January 5, 1999), or AMU website <http://erato.acnatsci.org/amu/>

Sixth International Symposium on Littorinid Biology: July 24-31, 1999, Hofstra University Marine Laboratory, Priory, Jamaica. For more information contact Dr. Robert F. McMahon, phone 817-272-2412, fax 817-272-2855, email r.mcmahon@uta.edu.

International Pandalid Shrimp Symposium: September 8-10, 1999, Halifax, Nova Scotia, Canada. This conference is cosponsored by NAFO, ICES and PICES. Participants are encouraged to submit papers on environmental and ecological influences, stock assessments and associated research, management strategies, and harvesting, processing and marketing. Abstracts must be submitted by April 15, 1999. For more information contact Peter Koeller at phone (902)426-5379, fax (902)426-1862, email Koellerp@mar.dfo-mpo.gc.ca, or website <http://www.mar.dfo-mpo.gc.ca/shrimp/>

Marketing Live Aquatics 1999: November 14-17, 1999, Seattle, Wa. For information on the 2nd International marketing and shipping live aquatic conference, see www.alaska.net/~mpaust.

Fourth International Abalone Symposium: February 6-11, 2000, University of Cape Town, South Africa. Final date for abstract submission is August 31, 1999. For more information contact Peter Cook or Ken Findlay, phone/fax +27-21-6503283, or email cms@physci.uct.ac.za.

Aquaculture Canada 2000: May 27-31, 2000, Moncton, New Brunswick, Canada. The Aquaculture Association of Canada's millennial meeting will be held at Hotel Beausejour. For more information contact Dr. Andrew Boghen, phone 506-858-4321, fax 506-858-4541, email boghena@umoncton.ca.

Third International Conference on Molluscan Shellfish Safety: June 19-24, 2000, Southampton College, Long Island University, Southampton, New York. Deadline for abstract submission is December 31, 1999. For more information or those wishing to organize a session, contact Dr. Sandra E. Shumway, Natural Science Division, Southampton College, Southampton, NY 11968 (contact numbers on back).

If you know of meetings or workshops that might be of interest to NSA members, please contact Jay Parsons at Email: jparsons@gill.ifmt.nf.ca, phone (709)778-0307 or fax (709) 778-0535.

CRAB-L listserv

CRAB-L listserv is an automatic electronic mail fan out system which provides a discussion forum for persons interested in crab fisheries worldwide. It is an electronic meeting house for the exchange of information and ideas, and for the expression of opinions. Information may also be posted on meetings, conferences, workshops, publications, and reports. Comments on market changes and potentials are also welcome.

Anyone may join.

The list is not intended to carry notices regarding job opportunities or job requests. NO advertisements by private sector companies are permitted.

Please restrict your postings to items related to crab fishery and stocks. All postings must also adhere to IOS policies for appropriate use of computing facilities.

NOTE: The address you use to post messages to the members is different than the address used to subscribe or unsubscribe which authorizes you to send and receive mail, which is different from the address for help requests.

How to SEND MESSAGES to CRAB-L

To send or "post" a message on CRAB-L so that it will be seen by all subscribers, send the message as e-mail to: CRAB-L@IOS.BC.CA just as you would if you were sending an e-mail to another person. You may have to add some additional routing information to send your message out via the internet, depending on your operating system.

How to SUBSCRIBE

THIS IS NOT THE SAME ADDRESS AS YOU WOULD NORMALLY USE TO SEND MESSAGES TO THE CRAB LIST. To subscribe to this list so that you can receive messages from other members, send a one line message with the text, "subscribe crab-l" to "mailserv@ios.bc.ca" (without the quotation marks at either end, note: upper or lower case letters may be used). You may have to add some additional routing information to send your message out to the internet, depending on your operating system.

How to UNSUBSCRIBE

To do so, send a one line message with the text "unsubscribe crab-l" to "mailserv@ios.bc.ca" without the quotation marks at either end, note: upper or lower case letters may be used). You may have to add some additional routing information to send your message out to the internet, depending on your operating system. You may want to unsubscribe if you will be away from your computer and unable to pick up e-mail messages for any length of time.

The Great Atlantic Shellfish Exchange

April 15-17, 1999

Prince Edward Hotel, Charlottetown, PEI

Atlantic Canada's Premier Shellfish Aquaculture Conference is being organized to coincide with the NSA meeting being held in Halifax, NS. The Conference is being co-hosted by the PEI Aquaculture Alliance and Atlantic Fish Farming. The conference and trade show usually attracts more than 200 industry representatives. This year's preliminary program includes sessions on:

- The Future of Shellfish Culture in Atlantic Canada
- Opportunities for the Clam Culture
- Value Added Opportunities for Opening Up New Mussel Markets
- Shellfish Health Issues – Pests, Predators, Etc
- Improving the Economics of American Oyster Production
- Shellfish Environment Interactions – Environmental Management Plans
- Promoting your Industry – Shellfish Festivals and other Ideas

Registration: \$65 per person plus GST.

For general information on the Exchange contact the PEI Aquaculture Alliance at ph: (902) 368-2757, fax: (902) 368-3958, e-mail: peiaqua@pei.sympatico.ca. For Trade show information or to pre-register contact Atlantic Fish Farming at ph: (902) 838-2515, fax: (902) 838-4392, e-mail: pmacneill@pei.sympatico.ca. For Hotel Reservations contact the Prince Edward Hotel at (902) 566-2222 (or 1-800-441-1414; be sure to mention the Exchange to get the special room rate of \$79.00).

Third International Conference on Molluscan Shellfish Safety

June 19-24, 2000, Southampton College, Long Island University, Southampton, New York.

Deadline for abstract submission is December 31, 1999. For more information or those willing to co-ordinate a special workshop on a topic issue, contact Dr. Sandra E. Stumway, Natural Science Division, Southampton College, Southampton, NY 11968, phone 516-287-8407, fax 516-287-8419, email sshumway@southampton.liunet.edu.

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