

# National Shellfisheries Association

## QUARTERLY NEWSLETTER



SPRING/PROGRAM 1994

SOLOMONS, MARYLAND

### **President's Message**

This is my last President's Message. First and foremost, I have to thank all the volunteers and elected members of the society for their help. **WITHOUT VOLUNTEERS THIS SOCIETY WOULD NOT BE ABLE TO FUNCTION.** If the new administration asks for help, please give them some of your time.

When I started my presidency I outlined several initiatives that had to do with examining the relationship of the society to the shellfish industry. A number of our industry members have prepared a questionnaire and are gathering a mailing list of both industry members and non-members. Information from this form should provide NSA with broad recommendations on what we can do to enhance the value of the society to the industry. How these recommendations will be implemented will require discussion and action by the incoming administration. I asked the awards committee to examine the possibility of presenting an award to an industry member. They have been considering a number of options and will be reporting to the Executive Committee just prior to our annual meeting in April.

The Audit-Budget-Finance Committee has been compiling our financial data from the mid-1980's to present. Currently we are in relatively good financial shape, but our goal is to be sure we can continue to maintain our publications and provide funds for other society activities. The annual meeting is currently subsidizing the journal and the newsletter. While this is the case with many small societies, we need to be sure that the members receiving publications also pay their share of the expenses. The balance between dues and meeting revenue is a critical issue for executive committee discussion.

We have an active Student Association. At the meeting there will be an auction of "valuable" shellfish items with the proceeds going toward the student endowment fund. Last year's auction not only provided money for the student endowment fund, but many of the items sold reflected the history of our organization and shellfisheries as a profession. Even if you don't want to bid, please come to the auction and learn a little about the society and its members and show your support for the student's efforts.

Don't forget that the next annual meeting will be the joint NSA/WAS/AFS Aquaculture '95. The dates (February 1-4, 1995) are much earlier than our usual

annual meeting time so it will seem like we just finished one meeting when the abstracts will be due for the next. I hope to see everyone in April at the Charleston meeting. If you have ideas, suggestions, etc., please contact me or one of the other society officers. We need to hear from you concerning your society.

John Kraeuter

### **Aquaculture '95 Update**

Aquaculture '95 is less than a year away now and plans are well underway. We have been extremely fortunate in booking Stephen J. Gould as the plenary speaker. Dr. Gould has indicated that he is very much looking forward to the meeting and has even offered to "host" a student luncheon. He hasn't yet provided a title for his talk; however, it should be a stimulating and informative lecture...well worth getting out of bed early to attend!

The program already includes 20 special sessions on topics ranging from hybrid bass and tilapia to scallops, crawfish, pearl oysters, oyster, mussels, and genetics. Bob Stickney is arranging a full day of Aquaculture 'Round the World and there will be another full day session (possibly two) on shrimp culture organized by George Chamberlain. PCOGA will be organizing a session as will the California Aquaculture Association. As always, we are expecting a large trade show and many special programs designed for the producers.

These are just a few of the offerings to be heard in San Diego. You will be receiving more information and registration materials soon. See you there!

Sandy Shumway

#### **IN THIS ISSUE...**

- Program for 1994 Annual Meeting
- General Agenda for Annual Meeting
- Hotel and Meeting Registration Info
- Aquaculture '95 Call for Papers
- List of Discounted Titles from Elsevier
- West Coast Research News

Deadline for contributions for the Summer 1994 issue of the NSA *Quarterly Newsletter* is May 20, 1994. Items may be sent via mail, FAX, or e-mail to Karolyn Hansen at the address on the back cover of this issue.



## **Recruits Corner**

Plans are well underway for the 1994 Annual Meeting in Charleston. Student activities will include a Student Reception and the Second Annual NSA Auction. We are still looking for volunteers to assist with staffing the NSA Registration Desk, supply assistance with audio-visual equipment, and assist with the Auction. Please contact Dave Bushek by phone or e-mail (609-785-0074; e-mail bushek@gandalf.rutgers.edu) if you will be attending the meeting and can help us out. Don't forget to bring your cv/ resume to the meeting - there will be a Jobs Board near the Registration Desk where they may be posted. I look forward to seeing all of you in Charleston.

Dave Bushek

## **2nd Annual NSA Auction**

Spring is just around the corner and with it comes spring cleaning. why not take the opportunity to send along some of your unwanted treasures to the Charleston meeting to support the Student Endowment Fund Auction? Last year's auction was a great success and we are looking forward to another fun and profitable evening in Charleston. Any shellfish related items are welcome...books, papers, NSA memorabilia, etc. Shell art, trinkets, jewelry and prints are also popular and all of your donations are tax-deductible. One of the hottest items last year was a rock covered with zebra mussels and color-coded by species generously donated by San Molloy. Paul Galtsoff's slide warmer also brought a good price. Take a look around your office, everyone has something they can offer. You can send your donations to me or you can bring them with you to Charleston.

We'll also be auctioning off some of the members' best home brew, so start those casks bubbling.

Going once, going twice....see you in Charleston!

Sandy Shumway

## **From the Editor of JSR...**

Apologies, apologies, apologies. I'm sure it hasn't gone unnoticed that the latest issue of the Journal was late in arriving. I'd like to blame it all on the fact that I've just relocated and most of my life is in cardboard boxes; however, I can't. There were several other contributing factors, not the least of which were the late arrival of two manuscripts for inclusion in the special sessions and the constant supply of snow to the northeast that interrupted the delivery of express mail and UPS parcels. Volume 13(1) is already in production and should arrive on your local newsstands by late June. Plans are also underway for a special issue during the next year on oyster disease. Any other suggestions for special sessions or sections are always welcome.

Have you checked to see that your library subscribes to the Journal??

Sandy Shumway

## **Research News**

West Coast News, submitted by Carolyn Friedman...

### **Mortality of Pacific Oysters in Tomales Bay, California**

Elevated mortality of seed Pacific oysters was observed in Tomales Bay, California. Several culturists experienced cumulative losses ranging between 50-87% last summer. Oysters grown near the mouth of Tomales Bay survived better than those reared further up in the Bay. Samples of oysters were examined by Carolyn Friedman (Ca Department of Fish and Game) and Ralph Elston (Battelle Marine Research Lab). No parasites were observed upon examination of fresh tissue squashes and no bacteris were cultured from hemolymph aspirates. Water temperatures were reported to be elevated last summer. In addition, heavy growth of *Enteromorpha intestinalis* which formed algal mats, and vast areas of anoxic substratum were also observed. The elevated mortality was attributed to severe environmental conditions.

### **Moribund Red Abalone from San Miguel Island, California**

Beginning in August of 1993, red abalone, *Haliotis rufescens*, from San Miguel Island have been observed by sport divers with symptoms similar to those of black abalone with withering syndrome (WS). These symptoms include atrophy of the pedal muscle, weakness and lethargy. The cause of WS in black abalone has not been determined. However, results from physiological studies completed by Gunadi Kismohandaka (grad student of Ron Hedrick and Carolyn Friedman at UC Davis) suggest that an inability to absorb nutrients from ingested food may be related to an affected black abalone's emaciated condition. Microscopic examination of stained tissue sections of black abalone revealed numerous renal coccidia and intestinal rickettsiales-like procaryotes. No other parasites were observed in large numbers in abalone with or without WS. No significant statistical association was observed between survival and condition of black abalone relative to intensity of infection in both field and laboratory studies. Rickettsiales-like procaryotes are ubiquitous organisms and are frequently observed within digestive epithelia of many marine invertebrates from the west coast of North America. However, microscopic examination of stained tissue sections of four red abalone with symptoms of WS contained high numbers of rickettsiales-like foci in digestive epithelia (N=3, 21, 22, 34 per 20X field). Four asymptomatic red abalone from the same embayment contained none or low numbers of rickettsiales-like foci (N=0, 0, 0.1, 1 per 20X field). No other pathogens were observed in either symptomatic or asymptomatic abalone. George Gardner (EPA Laboratory, Narragansett, RI) has observed numerous foci of rickettsiales-like procaryotes within digestive epithelia of black abalone from locations

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where WS is present. Mr. Gardner did not observe these procaryotes within black abalone from a location free of WS and feels that infections with rickettsia-like procaryotes may be associated with WS. As a result of physiological studies of black abalone and histological examination of digestive epithelia of red and black abalone, the California Fish and Game Department and the UC Davis Bodega Bay Marine Lab are currently investigating the relationship between these procaryotes and WS. Studies examining the transmissibility of WS and possible causative agent(s) are also in progress.

### **A Note of Thanks...**

Bob Goodman of Elsevier Publishing is about to retire. The National Shellfisheries Association thanks Bob for all his kindnesses to the association, its publication committee, our journal editor, and editorial board over the past years. Bob's vast knowledge of the publishing business as well as his wit and pleasant personality have made our association with him exceptionally pleasant. We wish him an enjoyable retirement!

## **Aquaculture '95** **Call for Papers**

Sea Fare Expositions, Inc. has announced the Call for Papers for Aquaculture '95, scheduled for February 1-4, 1995 at the Town and Country Hotel, San Diego, California. All NSA members will shortly receive meeting announcement and registration information directly from Sea Fare Expositions. Deadline for receipt of abstracts (poster and oral presentations) is July 15, 1994. Please note: FAX transmissions will NOT be accepted. Registration fees are (US currency):

*by 10/31/94    by 12/31/94    after 1/1/95*

Member	\$250	\$350	\$515
Non-member	350	470	565
Spouse	115	160	220

Registration fee includes: lunches Wednesday, Thursday and Friday; admission to all conference and poster sessions; admission to Exposition; Welcome and President's Receptions, including drink coupons; four Happy Hour drink tickets; refreshment breaks; conference tote bag, directory, abstracts and materials. Hotel accommodation rate is \$82.00 per night (plus tax) for either a single or double occupancy.

Please contact Sea Fare Expositions, Inc. if you do not receive your call for paper and registration information material by May 15, 1994. Their address is: Aquaculture

'95, Sea Fare Expositions, Inc., 850 NW 45th Street, Seattle, WA 98107 USA Phone: (206) 547-6030, FAX: (206) 548-9346, TELEX: 298 558 SFEUR

### **Plenary Speaker - Aquaculture '95**

**Dr. Stephen Jay Gould** will be the featured speaker for the Plenary Session at the Aquaculture '95 meeting scheduled for February 1-4, 1995 in San Diego, California. Dr. Gould is currently Professor of Geology at Harvard University as well as Curator of Invertebrate Paleontology, Museum of Comparative Zoology. He is a widely known lecturer and author. His books include: *This View of Life*, *The Panda's Thumb*, *The Mismeasure of Man*, *Hen's Teeth and Horse's Toes*, and *Wonderful Life*. In addition, Dr. Gould has received honorary degrees, literary awards and academic awards that would more than fill this page. Dr. Gould will honor us with a presentation relating to aquaculture in his unique blend of insight and humor. You do not want to miss this tremendous opportunity to hear one of this country's premier scientists!

### **Chinese Banquet - Charleston 1994**

Ken Chew has once again arranged for a Chinese culinary experience for the 1994 meeting attendees. The dinner will be held on Tuesday, April 26, 1994 at the Emperor's Garden Restaurant in Charleston. The menu will include: crab soup, fish, crispy duck, chicken with black bean sauce, tofu with shrimp, sauteed vegetables, beef with mushrooms, snow peas and bamboo shoots, scallops with straw mushrooms, and mandarin shrimp. Tickets (\$15.00 each) will be available on a first come, first served basis at the NSA registration desk; we have a limit of 100 people so buy your ticket early!

### **Deadlines, Deadlines, Deadlines.....**

**Please be sure to:**

- Send in **Meeting Registration** prior to **April 1, 1994** - after then the cost goes up!
- **Reserve your hotel room at the Sheraton Inn Charleston by March 22, 1994** (date may have passed by the time you receive this issue).
- Return your **Executive Committee Ballot** to **Tom Soniat by April 15, 1994** - make your vote count!



## HOTEL INFORMATION 1994 ANNUAL MEETING

### NATIONAL SHELLFISHERIES ASSOCIATION CHARLESTON '94

**APRIL 24 - 28, 1994  
CHARLESTON, SOUTH CAROLINA**

Hotel: Sheraton Inn Charleston  
170 Lockwood Drive  
Charleston, SC 29403 USA

Phone: 1-800-968-3569  
or (803) 723-3000 (local)

**Conference Rates:** \$66.00 single/double occupancy plus sales tax and accommodations tax (8%). Extra bed (roll-away) in room is available for an additional \$10.00 per night. Students please note: the Sheraton has confirmed that three or four persons may stay in a room for the \$66.00 rate. Please call and confirm that there are two double beds in the room. **Cut-off Date for Reservations is March 22, 1994. Please make your reservations directly with the Sheraton via phone or mail.** If mailing in your reservation, please call first to verify the amount required to guarantee your room.

## REGISTRATION INFORMATION 1994 ANNUAL MEETING

The 1994 National Shellfisheries Association Annual Meeting is scheduled for April 24-28, 1994 in Charleston, South Carolina. The meeting will be held at the Sheraton Inn Charleston and you should make your reservations on or before March 22, 1994 (see information below). Meeting registration is being handled by Local Arrangements Chair Rick DeVoe. If you register **before April 1**, rates are: members, \$160, non-members, \$200, student members, \$100. Registration rates **after April 1** are: members \$205; non-members, \$245; student members, \$145. Daily registration is available at \$70 per day. Please note that your registration fee includes the Sunday President's Reception, Monday-Tuesday box lunches, Wednesday Business Luncheon, and technical session coffee/refreshment breaks. Additional guest tickets are available for the Sunday President's Reception (\$20 each). Ken Chew is again organizing a multi-course Chinese Dinner for the Charleston meeting - please check at the on-site registration desk for ticket prices and date. **Your registration form (enclosed in this Newsletter) and check or money order (drawn on U.S. bank and made payable to: NSA '94) should be sent to: Elaine Knight, South Carolina Sea Grant Consortium, 287 Meeting Street, Charleston, SC 29401 USA.** Please direct any questions concerning registration to Elaine or Rick (Phone: 803-727-2078 FAX 803-727-2080). We look forward to seeing you in Charleston!

## GENERAL AGENDA 86th NSA MEETING

Program Chair Bill Fisher has provided a General Agenda for the 1994 Annual Meeting in Charleston. The Technical Program appears on the following pages.

### SUNDAY, APRIL 24

1:00 pm - 6:00 pm	EXCOM Meeting
5:00 pm - 8:00 pm	Registration
7:00 pm - 9:00 pm	President's Reception

### MONDAY, APRIL 25

8:00 am - 4:00 pm	Registration (open Monday - Wednesday)
3:30 pm - 4:30 pm	Poster Session
6:00 pm - 7:00 pm	Student's Reception
7:00 pm - 9:00 pm	NSA Auction (open to all)

### TUESDAY, APRIL 26

6:30 pm Chinese Dinner

### WEDNESDAY, APRIL 27

Noon - 1:30 pm NSA Business Luncheon  
(cost included in Registration fee)

### THURSDAY, APRIL 28

Noon Sessions Close

1:30 pm - 4:30 pm	Tour 1: Atlantic Little Neck Clam Farm
1:30 pm - 4:30 pm	Tour 2: South Carolina Marine Resources Research Institute Laboratories
1:30 pm - 5:30 pm	Tour 3: Shellfish processing and technology at McClellanville, SC.

**Please note:** check at the Registration Desk upon your arrival for more information on the tours scheduled for Thursday, April 28. Space may be limited so be sure to sign up early. Tickets (\$15.00 each) will be available for the Tuesday Chinese Dinner at the Registration Desk. As our limit is 100 people, you may want to purchase your ticket(s) early!

## TECHNICAL SESSION OVERVIEW 1994 NSA MEETINGS

### MONDAY, APRIL 25

<u>Time</u>	<u>Session</u>	
8:30 - 11:40	(A)	Bivalve Genetics
8:30 - noon	(B)	Feeding and Nutrition of Bivalves
1:30 - 3:10	(A)	Broodstock Management
1:30 - 3:10	(B)	Decapod Crustacean Biology
3:30 - 4:30		Poster Session

### TUESDAY, APRIL 26

8:30 - 11:40	(A)	Bivalve Recruitment
8:10 - noon	(B)	<i>Perkinsus marinus</i> Disease of Oysters
1:40 - 4:30	(A)	Bivalve Stock Assessment
1:20 - 5:00	(B)	Characteristics of <i>Perkinsus marinus</i>

### WEDNESDAY, APRIL 27

8:10 - 11:40	(A)	Bivalve Aquaculture
8:10 - 11:40	(B)	Bivalve Diseases and Defense Mechanisms
1:45 - 5:20	(A)	Constraints to the Development and Growth of Commercial Mollusk Aquaculture in the U.S (Panel)
2:00 - 4:00	(B)	Diagnosis of <i>Perkinsus marinus</i> Disease of Oysters (Workshop)
4:00 - 5:00	(B)	Culture of <i>Perkinsus marinus</i> (Workshop)

### THURSDAY, APRIL 28

8:10 - noon	(A)	Bivalve Stock Enhancement and Restoration
8:30 - 9:50	(B)	Bivalve Mollusk Biology
10:20 - noon	(B)	System Level Influences of Bivalve Filter Feeders (Panel)

## TECHNICAL SESSIONS 1994 NSA ANNUAL MEETING Monday, April 25 SESSION A

### Bivalve Genetics (Stan Allen, Chair)

8:30 More light on sex determination in bivalves from all-female, gynogenetic *Mulinia lateralis* Say. ALLEN, S.K., Jr.; GUO, X.

8:50 Rapid morphometric discrimination between the hard clams *Mercenaria mercenaria*, *Mercenaria campechiensis*, and their hybrids. DILLON, R.T., Jr.; HADLEY, N.H.

9:10 Mitochondrial DNA variation in the bay scallop, *Argopecten irradians*, and the calico scallop, *Argopecten gibbus*. BLAKE, S.G.

9:30 The relationship between habitat and gene flow among intertidal bivalve demes. McMILLAN, E.W.

9:50 BREAK

10:20 A unique process for producing tetraploids also demonstrates viability of aneuploid *Crassostrea gigas* Thunberg. GUO, X.; ALLEN, S.K., Jr.

10:40 Hybrid vigor in Pacific oysters: an experimental approach using crosses among inbred lines. HEDGECOCK, D.

11:00 The suitability of land based evaluations of *Crassostrea gigas* as an indicator of performance in the field. DEBROSSE, G.; ALLEN, S.K., Jr.

11:20 Growth of triploid *Crassostrea gigas* under natural conditions in the lower Chesapeake Bay. MANN, R.; BURRESON, E.M.; ALLEN, S.K., Jr.

11:40 LUNCH BREAK

### Broodstock Management (C. Langdon, Convenor and Chair)

1:30 Identification and acquisition of broodstock for the aquaculture of molluscan shellfish. MANN, R.

1:50 Broodstock husbandry of bivalve molluscs. ROBINSON, A.

2:10 Genetics and broodstock management. HEDGECOCK, D.

2:30 Development of breeding programs; past, present and future. ALLEN, S.K., Jr.

2:50 Plans for a national broodstock laboratory for molluscan shellfish. LANGDON, C.J.

3:10 BREAK

3:30

-4:30 POSTER SESSION



## SESSION B

### Feeding and Nutrition of Bivalves (Tom Soniat, Chair)

8:30 Growth responses of *Mytilus edulis* to changes in water flow: A test of the "Inhalant Pumping Speed" hypothesis. GRIZZLE, R.E.; LANGAN, R.; HOWELL, W.H.

8:50 Variations in feeding behavior of two sub-tropical bivalves in response to acute increases in sediment load. MACDONALD, B.A.; WARD, J.E.

9:10 The role of mucus in particle transport on bivalve pallial cavity organs. BENINGER, P.G.; ST.-JEAN, S.

9:30 Palp function in *Mytilus edulis* (Fam. Mytilidae) and *Placopecten magellanicus* (Fam. Pectinidae), determined by mucocyte mapping and video endoscopy. ST-JEAN, S.; BENINGER, P.

9:50 BREAK

10:20 Physiological and biochemical changes associated with normal development and nutritional stress in postlarvae of the pacific oyster *Crassostrea gigas*. GARCIA-ESQUIVEL, Z.; GRICELJ, V.; GONZALEZ-GOMEZ, M.A.

10:40 Digestive diverticula atrophy in eastern oysters, *Crassostrea virginica*, exposed to salinity and starvation stress. WINSTEAD, J.T.

11:00 Development of a diet for rearing early juvenile freshwater pearly mussels. GATENBY, C.M.; NEVES, R.J.; PARKER, B.C.

11:20 Seasonal variation in the relative utilization of dietary protein and carbohydrate by the mussel, *Mytilus edulis* L. KREEGER, D.A.; HAWKINS, A.J.S.; BAYNE, B.L.; LOWE, D.L.

11:40 The effects of temperature, salinity and food supply on oyster production in Louisiana: model predictions versus field data. SONIAT, T.M.; POWELL, E. N.

12:00 LUNCH BREAK

### Decapod Crustacean Biology (Dave Armstrong, Chair)

1:30 Habitat selection by young of the year Dungeness crab *Cancer magister* Dana and predation risk in intertidal habitats. FERNANDEZ, M.E.; IRIBARNE, O.; ARMSTRONG, D.A.

1:50 Protandric hermaphroditism in the bay shrimp *Crangon franciscorum* (Decapoda, Caridea). GAVIO, M.A.; ORENSANZ, J.M.; ARMSTRONG, D.

2:10 Not just a storage tank: anatomical, biochemical, and microbiological studies of spermatheca structure and function in snow crab, *Chionoectes opilio*. BENINGER, P.G.; ELNER, R.W.

2:30 Bioenergetics of intertidal 0+ Dungeness crab (*Cancer magister*; does demand exceed supply?). ARMSTRONG, D.; FERNANDEZ, M.; IRIBARNE, O.

2:50 Toxicity and pathogenicity tests using grass shrimp embryos. FISHER, W.; FOSS, S.S.

3:10 BREAK

3:30

4:30 POSTER SESSION

## Tuesday, April 26 SESSION A

### Bivalve Recruitment (Bill Arnold, Chair)

8:30 Seed production of the rock scallop, *Crassadoma gigantea*. RHEE, W.Y.

8:50 Chemical identity of oyster larval settlement cues. ZIMMER-FAUST, R.K.; TAMBURRI, M.N.

9:10 Settlement of *Crassostrea virginica* larvae; effects of water flow and a water-soluble chemical cue. TURNER, E.J.; PALMER, M.A.; LUCKENBACH, M.; ZIMMER-FAUST, R.K.

9:30 Spawner-recruit dynamics of bay scallops (*Argopecten irradians concentricus*) in Florida. ARNOLD, W.S.; MARELLI, D.C.; BRAY, C.P.

9:50 BREAK

10:20 Estuary-scale dispersal of post-larval mussels, *Mytilus edulis*, among eelgrass (*Zostera marina*) meadows and subsequent recruitment to planted live and mussel shell cultch. NEWELL, C.R.

10:40 Factors limiting subtidal oyster recruitment in coastal Georgia. O'BEIRN, F.X.; HEFFERNAN, P.B.; WALKER, R.L.

11:00 Factors determining recruitment success of *Crassostrea virginica* in a temperate latitude estuary; a modeling study. DEKSHENIEKS, M.M.; HOFMANN, E.E.; KLINCK, J.M.; POWELL, E.N.

11:20 Intertidal oyster reefs as a tool for enhancing settlement, growth, and survival of the oyster, *Crassostrea virginica*. BARTOL, I.K.

11:40 LUNCH BREAK

### Stock Assessment (Steve Tettelbach, Chair)

1:40 Molluscan fisheries of Panama. VILLALAZ, J.R.; GOMEZ, J.A.

2:00 Size variability of juvenile (0+ yr) bay scallops in Long Island, New York populations. TETTELBACH, S.T.; WENCZEL, P.; HUGHES, S.W.T.

2:20 Evaluation of *Mercenaria spp.* abundance and growth in northern Gulf of Mexico habitats. COEN, L.D.; HECK, K.L., Jr.; JUDGE, M.L.

2:40 The potential use of shell growth marks to determine natural growth patterns and ages of larval and post larval bivalves: A species survey. BALDWIN, B.S.

3:00 BREAK

3:30 Estimating population parameters of Delaware Bay oysters. FEGLEY, D.R.; KRAEUTER, J.N.; FORD, S.E.; JONES, D.R.; HASKIN, H.H.

3:50 Eastern oyster stock assessment in Maryland's Chesapeake Bay. HOMER, M.L.; TARNOWSKI, M.; BAYLIS, L.; JENSEN, W.P.

4:10 An oyster management information system: entergrating biological, physical, and geographical dimensions. SMITH, G.F.; JORDAN, S.J.; GREENHAWK, K.

## SESSION B

### Perkinsus marinus Disease of Oysters (Sammy Ray and Jay Andrews, Chairs)

8:10 A historical perspective on *Perkinsus marinus* disease of oysters in the Gulf of Mexico. RAY, S.

8:30 History of *Perkinsus marinus* disease of oysters in the Chesapeake Bay. ANDREWS, J.

8:50 Synergetic effects of temperature and salinity on the response of oysters (*Crassostrea virginica*) to the pathogen, *Perkinsus marinus*. CHU, F.E.; VOLETY, A.K.; CONSTANTIN, G.

9:10 Physiological effects of protozoan parasitism on the eastern oyster *Crassostrea virginica*: feeding and metabolism. NEWELL, R.I.E.; PAYNTER, K.; BURRESON, G.

9:30 Performance of various oyster populations in Chesapeake Bay: growth and disease tolerance. PAYNTER, K.T.

9:50 BREAK

10:20 Performance variation among native and selectively-bred eastern oyster strains in North Carolina. BROWN, B.L.; BUTT, A.J.; PAYNTER, K.T.

10:40 Field exposure of triploid *Crassostrea gigas* to *Haplosporidium nelsoni* (MSX) and *Perkinsus marinus* (Dermo) in the lower Chesapeake Bay. BURRESON, E.M.; MANN, R.; ALLEN, S.K., Jr.

11:00 Long-term changes in the distribution of *Perkinsus marinus* in Gulf of Mexico oysters, a product of climatic cycles? KIM, Y.; POWELL, E.N.

11:20 *Perkinsus marinus*: Triggering mechanisms for epizootics. POWELL, E.N.; HOFMANN, E.E.; KLINCK, J.M.

11:40 *Perkinsus marinus* and oyster populations: Modeling the disease. HOFMANN, E.E.; KLINCK, J.M.; POWELL, E.N.

12:00 LUNCH BREAK

### Characteristics of the Disease Agent Perkinsus (Frank Perkins, Chair)

1:20 Race-specific interactions between *Crassostrea virginica* and *Perkinsus marinus*. BUSHEK, D.; ALLEN, S.K.

1:40 Interannual abundance variation of environmental *Perkinsus marinus* cells in Chesapeake Bay waters. LI, T.; ROBERSON, B.S.; DUNGAN, C.F.

2:00 Use of a colorimetric cell proliferation assay with in vitro-propagated *Perkinsus marinus* to optimize culture conditions, assess pathogen chemosensitivity, and determine physical tolerances. DUNGAN, C.F.; HAMILTON, R.M.

2:20 Comparison of effectiveness of potential chemotherapeutic agents against *Perkinsus marinus* cultured in thioglycollate medium and in a complete growth medium. KRANTZ, G.

2:40 Acute osmotic tolerance of cultured cells of the oyster pathogen *Perkinsus marinus*. RAGONE CALVO, L.M.; BURRESON, E.M.; PAYNTER, K.T., Jr.

3:00 BREAK

3:30 Detection of proteases in the supernates of *Perkinsus marinus* cultures. FAISAL, M.; LA PEYRE, J.F.; SCHAFHAUSER, D.Y.; RIZKALLA, E.H.

3:50 A comparative study of acid phosphatase in the parasite *Perkinsus marinus* and its host *Crassostrea virginica*. VOLETY, A.K.; CHU, F. E.

4:10 Using molecules to diagnose *Perkinsus* species and determine the affinities of parasites of uncertain phylogenetic affinities from fish and shellfish. GOGGIN, C.L.; CAWTHORN, R.J.

4:30 Phylogenetic and morphological considerations of *Perkinsus* spp. PERKINS, F.

## Wednesday, April 27 SESSION A

### Bivalve Aquaculture (John Supan, Chair)

8:30 Blue mussel aquaculture parameters. DAVIDSON, T.J.

8:50 Environmental correlates to explain oyster field growth or picking the right spot for oyster aquaculture. LUCKENBACH, M.; SHAFFER, V.L.

9:10 Oyster (*Crassostrea gigas*) culture management on the western coast of Cotentin, Normandy (France). GOULLETQUER, J.P.; JOLY, J.P.; LeGAGNEUR, E.; RUELLE, F.

9:30 The technical feasibility of commercial hatchery and remote setting operations in Louisiana. SUPAN, J.E.; WILSON, C.A.

9:50 BREAK

10:20 The economic feasibility of producing oyster seed using remote setting technology in Louisiana. SUPAN, J.E.; HUFFMAN, D.C.; WILSON, C.A.



10:40 Performance of a tidal-powered upwelling nursery system for juvenile clams in South Carolina. HADLEY, N.H.; RHODES, R.J.; BALDWIN, R.B.; DEVOE, M.R.

11:00 Cost analysis of a tidal-powered upwelling nursery system for juvenile clams. RHODES, R.J.; HADLEY, N.H.; BALDWIN, R.B.; DEVOE, M.R.

11:20 Development of a nationwide fish and shellfish consumption survey: model design and pilot test results. PETERS, E.C.; DONAHOE, S.B.; HACKLEY, B.M.; WEDDIG, L.J.

11:40 LUNCH BREAK

**Constraints to the Development and Growth of Commercial Mollusk Aquaculture in the U.S. (J. Manzi, Panel Convenor and Chair)**

1:45 Introduction to the Session: MANZI, J.

1:50 Northwest:  
Industry Perspective: DONALDSON, J.M.  
R & D Needs: CHEW, K.

2:20 Gulf Coast:  
Industry Perspective: NELSON, C.  
R & D Needs: ROUSE, D.

2:50 Southeast:  
Industry Perspective: MANZI, J.  
R & D Needs: VAUGHAN, D.

3:20 BREAK

3:50 Mid-Atlantic:  
Industry Perspective: PIERSON, M.  
R & D Needs: CASTAGNA, M.

4:20 Northeast:  
Industry Perspective: NEWELL, C.  
R & D Needs: RICE, M.

4:50 Panel Discussion

**SESSION B**

**Bivalve Diseases and Defense (Al Eble, Chair)**

8:10 Response of oysters to a culture of toxin producing "phantom dinoflagellate". KRANTZ, G.; BURKHOLDER, J.M.; GLASGOW, H.B.

8:30 Molecular characterization of cellular mechanisms involved in *Mercenaria* spp. gonadal neoplasia. KRAUSE, M.; GARDNER, G.; Van BENEDEN, R.J.

8:50 Prevalence of *Bonamia ostreae* in *Ostrea edulis* populations in Maine. BARBER, B.J.; DAVIS, C.

9:10 In vitro culture of *Haplosporidium nelsoni*. KLEINSCHUSTER, S.J.; FORD, S.E.; SWINK, S.L.

9:30 Cytology and behavior of hemocytes of the zebra mussel, *Dreissena polymorpha*: a time-lapse video study. EBLE, A.F.; SAMPSON, J.

9:50 BREAK

10:20 Cytometric analyses of oyster hemocytes from various body locations. MULHOLLAND, D.S.; FRIEDL, F.

10:40 Comparison of oxyradical generation by hemocytes from common estuarine bivalve mollusks. ANDERSON, R.S.; BRUBACHER, L.L.; PAYNTER, K.T.

11:00 Characterization of reactive oxygen intermediate production in oyster hemocytes. AUSTIN, K.; PAYNTER, K.T.

11:20 Comparative form and function of oyster *Crassostrea virginica* hemocytes from Apalachicola Bay (Florida) and Chesapeake Bay (Virginia). OLIVER, L.M.; FISHER, W.S.

11:40 LUNCH BREAK

**Perkinsus marinus Workshop (Bill Fisher, Convenor)**

2:00 Diagnosis of *Perkinsus marinus* disease of oysters (Panel and discussion).

4:00 Culture techniques for *Perkinsus marinus* (Panel and discussion).

**Thursday, April 28  
SESSION A**

**Bivalve Stock Enhancement and Restoration (G. Flimlin, Convenor and Chair)**

8:10 Enhancement of a scallop bed by the natural release of spat from a scallop aquaculture site. PARSONS, G.J.; ROBINSON, S.M.C.; MARTIN, J.D.

8:30 The bay scallop restoration project in the Westport River. TURNER, W.H.; SOARES, S.J.

8:50 Settlement and recruitment of bay scallops, *Argopecten irradians*, to artificial spat collectors in the Westport River Estuary, Westport, Massachusetts. TAMMI, K.A.; SOARES, S.; TURNER, W.; RICE, M.A.

9:10 History and current status of New York State shellfish enhancement. RIVARA, G.

9:30 Enhancing New York's Great South Bay hard clam (*Mercenaria mercenaria*) resource: determining which strategy to use. KASSNER, J.

9:50 BREAK

10:20 Predation minimization strategies for reseeding natural populations of hard clams. PETERSON, C.H.; SUMMERSON, H.C.

10:40 Shellfish stock enhancement on Martha's Vineyard. KARNEY, R.C.



11:00 Shellfish productivity as the impetus for embayment management. MACFARLANE, S.L.

11:20 The potential for relaying as an enhancement method for the soft-shell clam, *Mya arenaria*. ROBINSON, S.M.C.

11:40 Shellfish stock rehabilitation in the National Estuaries Program. SLAUGHTER, E.

## SESSION B

### **Bivalve Mollusk Biology (Frank Freidl, Chair)**

8:30 Gametogenic cycle in the non-native Atlantic surfclam, *Spisula solidissima* (Dillwyn, 1817), cultured in the coastal waters of Georgia. SPRUCK, C.; SWEENEY, M.; HURLEY, D.; WALKER, R.L.

8:50 Vitellogenesis in the hard clam, *Mercentaria mercenaria*; synthesis and utilization of vitellin. LEE, R.F.; SWEENEY, M.; WALKER, R.

9:10 Surface and tissue oxygen tensions for monovalve preparations of the freshwater bivalve *Elliptio buckleyi* (Lea). VITALE, M.A.; FRIEDL, F.E.

9:30 Atrial natriuretic peptides in hemolymph and tissues of the eastern oyster, *Crassostrea virginica*. FRIEDL, F.E.; VESELY, D.L.; HALEY, J.A.

9:50 BREAK

### **System Level Influences of Bivalve Filter Feeders (Richard Dame, Convenor)**

10:20 Grazing of natural particulates by the mussel, *Mytilus edulis*: a spatial and temporal perspective. NEWELL, C.R.

10:40 The role of commercially valuable aquatic species in ameliorating the effects of coastal eutrophication. NEWELL, R.I.E.

11:00 Scales and results of bivalve feeding studies: Are they dependent or independent of each other? PORTER, E.T.; NEWELL, R.I.E.

11:20 Voracious bivalves in San Francisco Bay: Eliminating the phytoplankton bloom in the North Bay and controlling the seasonal cycles of phytoplankton in the South Bay. THOMPSON, J.K.

11:40 Spatial scales, coastal ecosystems and bivalve filter feeders. DAME, R.F.

--- END OF TECHNICAL SESSIONS ---

**Thursday, April 28**

**Afternoon Activities**

See General Agenda on page 5

## Meetings/Courses

*National Shellfisheries Association Annual Meeting, April 24-28, 1994, Charleston, SC USA.* Information can be found elsewhere in this issue.

*Pearls '94, May 14-19, 1994, Honolulu, Hawaii USA.* For more information please contact: Pearls '94 Conference Headquarters, Robin Crest, Organizer, 940 Emmett Ave., Suite 14, Belmont, CA 94002 USA. Phone: (415) 595-2682, FAX: (415) 595-3379.

*American Malacological Union Annual Meeting, July 9-14, 1994, Houston, Texas USA.* Deadline for receipt of abstracts: May 1, 1994. For more information and abstract instructions please contact: Constance E. Boone, Malacology - Houston Museum of Natural Science, 1 Hermann Circle Drive, Houston, Texas 77030 USA. Phone: (713) 639-4677 FAX: (713) 523-4125.

*10th International Pectinid Workshop, April 26-May 2, 1995, Cork, Ireland.* For information please contact: Dr. Gavin Burnell, Department of Zoology, University College, Lee Maltings, Prospect Row, Cork IRELAND. Phone: 353-21-276871 FAX: 353-21-270562

## Employment / Funding

*Student Research Grant in Malacology* The Western Society of Malacologists in conjunction with the Santa Barbara Malacological Society, The San Diego Shell Club, and the Northern California Malacozoological Club are offering a student research grant. Funds are available for actual research costs, including but not limited to, field and laboratory equipment, chemicals, photographic equipment, computer time and supplies, microscope usage fees, and reasonable research travel costs. Application is open to any full time student in a formal graduate or undergraduate degree program; applications are welcome from all countries. Research focus must be the systematics, biology, ecology, physiology, biochemistry, or paleontology of marine, terrestrial or freshwater mollusks. Deadline for application is May 1, 1994 and awards will be announced by July 29, 1994. For more information and application form please send a self-addressed, stamped (U.S. addresses only) envelope to: Malacology Grant, Department of Invertebrate Zoology, Santa Barbara Museum of Natural History, 2559 Puesta del Sol Road, Santa Barbara, CA 93105 USA. Phone: Paul Scott (805) 682-4711 extension 319, FAX: (805) 569-3170, e-mail (Internet): [inverts@sbrnmh.rain.org](mailto:inverts@sbrnmh.rain.org)

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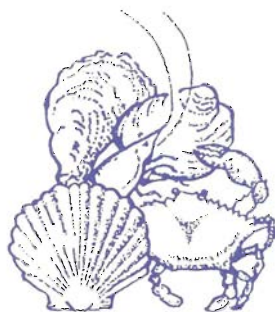
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