

# National Shellfisheries Association

## QUARTERLY NEWSLETTER

Spring 1989



Lewes, Delaware

## 81st NSA Annual Meeting Part of Aquaculture '89- Los Angeles

The 81st annual meeting of the National Shellfisheries Association was held in conjunction with Aquaculture '89 at the Westin Bonaventure Hotel in Los Angeles, California from February 12-16, 1989. NSA was a major sponsor of this triennial event along with the Catfish Farmers of America, Fish Culture and Bioengineering sections of the American Fisheries Society, the Shellfish Institute of North America (SINA), the U.S. Trout Farmers Association and the World Aquaculture Society.

The Aquaculture '89 program included six plenary sessions:

- \* WAS President (and NSA past-President) John Manzi, a marine scientist at the Marine Resources Research Institute in Charleston, S.C.--"Aquaculture Research Priorities for the 1990s."

- \* Bjarne Mork Eiden, Norway's minister of fisheries--"Aquaculture-The Fisheries Industry from Capture to Cultivation."

- \* Dr. Chua Thia-Eng, president of the Asian Fisheries Society--"Towards Professionalism in Aquaculture."

- \* Dr. Harald Rosenthal, scientist at Biologische Anstalt Helgoland in West Berlin--"The Impact of Aquaculture on the Environment."

- \* Dr. William E.M. Lands, professor of biological chemistry at the University of Illinois--"Human Needs and Fish Feeds."

- \* William Mockbee, an advertising consultant--"Ready or Not, Here Comes the Year 2000."

The NSA technical program, arranged by Vic Kennedy, consisted of 105 oral and 10 poster presentations. Special topics covered this year included: "Human Influences on the Dispersal of Living Organisms and Genetic Material into Aquatic Ecosystems" (Moderators: Aaron Rosenfield and



Greg Tracey, winner of this year's Thurlow C. Nelson Award receives his certificate from Nelson Award Committee Chair Sandy Shumway.

### PRESIDENT'S MESSAGE

About five years ago, Al Chestnut, who served as President of the Association from 1953 to 1955, sent me a box of archived Association papers. The papers included copies of our annual meeting programs from the 1930's (in those days, published by the Fishing Gazette on our behalf), minutes of the Executive Committee meetings from the 1950's (which apparently lasted less than an hour), and annual budgets from the 1950's and 60's which never exceeded \$600. Dues for each of the 100 or so members were \$2.00 per year, and for that, each received an occasional mimeographed newsletter and copies of "Conference Abstracts" presented at the annual meeting. These old papers were extremely interesting for they provided one perspective on the character and role of the Association thirty, forty and fifty years ago.

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As has almost everything, the Association has changed. Probably because of our increase in size (nearly 900 members) and broad geographic distribution (in the US, Canada and 18 other nations), the Association's functions are more formal than they were in the past. Our meetings and publications are far more sophisticated and our annual budgets are approaching \$50,000. The technical sessions of our Annual Meetings include more papers covering a greater range of topics in shellfisheries science and management than ever before. Our flagship effort, the *Journal of Shellfish Research*, has achieved stability and continues to set new standards for quality of science and print, quick turnaround time, and international distribution. And the *Quarterly Newsletter* communicates timely information on Association activities and member services in a truly professional style.

There have been costs associated with this evolution of the Association, costs in the forms of increased member dues and increased reliance on members who volunteer to serve on committees and as officers.

A simple comparison of the changes in the US Consumer Price Index since the days of our \$2.00 dues reveals that in fact, our expanded activities and member services don't cost much more in terms of today's dollar than the mimeographed newsletter and convention abstracts did in 1950. Consumer services costing \$2 in 1950 would cost \$18 in 1989. The 1989 dues increase to \$30 (\$20 for students) represents an increase of only \$12 over the dues we would be charging today for the informal, limited member services we provided nearly forty years ago. I believe current NSA members are receiving a fair return on their annual dues payments. Perhaps more importantly, low member fees assures easy access to our professional association, its publications and meetings. Ease of access to the products of shellfisheries research and management is important because it directly enhances the prominence of our discipline.

The evolution of the Association continues and there are exciting developments on the horizon. Our co-sponsorship of the highly successful Aquaculture '89 conference in Los Angeles brought us needed financial gains which will be used to support the *Journal*.

Many of us are working on the plans for the next Annual Meeting (April 1 - 5, 1990) to be held in Williamsburg, Virginia. I am extremely pleased to report that during a meeting with representatives of the Shellfish Institute of North America (SINA) in Washington in April, it was agreed that NSA and SINA would once again meet jointly in 1990 for the Williamsburg meeting. The renewal of this relationship with our colleagues in industry is important to the Association, and we can now look forward to meeting jointly with SINA every two to three years.

Plans for our 1991 meeting are firming up; we will meet in late June at the Sonesta Hotel in Portland, Maine. Costs to our members of these annual meetings are a constant concern to the Executive Committee. We have secured very

favorable agreements for both the 1990 and 1991 meeting facilities with single or double room rates of \$62 per night.

Discussions have already begun on our 1992 meeting which is likely once again to be part of the jointly-sponsored, triennial aquaculture conferences. It is a positive reflection on the strength of the Association that we have been asked to lead the effort to organize Aquaculture '92. The Executive Committee just approved establishment of the "NSA Student Endowment Fund" through which the Association will defray the costs for students to present papers at our annual meetings. We hope to collect sufficient funds in the short-term to begin sponsoring student travel and associated costs of presenting a paper at the Williamsburg meeting. In the long-term, we are seeking to establish an endowment, the interest of which will be used to increase student participation in the Association.

Finally, we negotiated an agreement with Elsevier Science Publishers so that their shellfisheries-related books could be purchased by our members at a substantial discount. The list of books and an order form appear in this issue of the *Newsletter*. This offer will remain in effect at least until April, 1990. This Association will not receive any revenue from this discount program. Please note that in some cases, the savings realized on the purchase of a single book is greater than regular member dues for the year.

I am proud of the Association because I believe we are efficiently meeting the needs for an international, professional association which has taken on an important role in promoting shellfisheries research and management. The strength of the Association today is largely a result of the efforts of officers and appointed committee members who have given a great deal of their time to managing the affairs of NSA. Because of their efforts, I am able to take the helm of an organization already on a steady course. In particular, I would like to thank Roger Mann, the immediate past president, Ed Rhodes, who served as Secretary-Treasurer for 1987-89, and John Manzi, for his leadership role in the Aquaculture '89 meeting.

However, there are always areas for improvement and critical new initiatives begging for support. It is critical for the continuing health of this Association that our members communicate to the Executive Committee their feelings on the Association's existing activities and new areas worthy of attention. I call on all members to contact me or any of the Association's officers with criticisms and suggestions. Our addresses and telephone numbers were put onto the back page of this *Newsletter* so anyone could contact us. The Association will always need new ideas and fresh perspectives, so please take me up on this. Just as crucial to the health of any association is a continuous stream of new people willing to serve on committees and in official positions. Consider this an invitation to join the ranks once occupied by many of the great scientists and managers in shellfisheries, the likes of Thurlow Nelson, Joseph Glancey, Victor Loosanoff, Paul Galtsoff, all of whom served as NSA officers at one time.

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As a minimum, each NSA member should help us recruit new members. If any of your colleagues or students are involved in shellfisheries issues, talk to them about joining. Show them this Newsletter and the four issues of the Journal we published in 1988. And make your own plans now to attend the 1990 Williamsburg meeting. I look forward to meeting many of you there, and in the meantime, please feel free to contact me or any other member of the Executive Committee with feedback on this, your professional association. Thank you.

Scott E. Siddall

### **Summary of the 1988 Executive Committee (EXCOM) Meeting**

The EXCOM meeting was held on Sunday February 11, 1989. Secretary-Treasurer Ed Rhodes presented the financial report with a summary of accounts of the three cost centers: Administrative, Publications and Annual Meeting. Our administrative costs, primarily for postage and printing of stationery and envelopes, are relatively small (\$2224 in FY 87-88, or \$2.78 per NSA member). If our annual meeting is a break even proposition, then all of our major expenses are in the publications area. It currently costs us about \$17,150 to assemble, print and mail out a typical 200 page issue of JSR. Some of this cost is covered by page charges - recent experience indicates about \$7500 per issue. Also, about \$2500 in revenue for each JSR comes from our institutional subscribers. This leaves, on average for the last 4 JSRs, a difference of \$7150 for each issue to be paid from dues revenue, or \$17.87 for each NSA member in a 2 issue year. Additionally, the Quarterly Newsletter costs \$3.75 per member per year. Total member services provided from dues amount to \$24.40. Average dues collected from 95 student members (\$20) and 705 regular members (\$30) are \$28.81.

Our financial goal is to have an end-of-year treasury balance equivalent to a one year operating budget or approximately \$60,000. Our fund balance at the end of the last fiscal year was less than \$15,000. An increase in the cost and number of institutional subscriptions and the addition of page charges are expected to recover a large portion of the costs for producing the Journal currently supported by membership dues.

In other business the EXCOM, by a unanimous vote, added a life membership category to NSA. Bylaw II,2 was added to the NSA Constitution stating that "Any person qualified for membership in the Association may become a regular member for life upon a one time payment of an amount determined by the Executive Committee". The amount was set at \$1000. In order to encourage donations to NSA, it was decided to add a note to the annual dues invoice that indicates our non-profit status and states that donations to NSA are tax deductible.

President Roger Mann reported that 160 ballots were cast in the election for the 1989-90 Executive Committee Officers. The results of the ballot were:

**President (elected in 1988)**

Scott E. Siddall

**President-Elect**

Victor S. Kennedy

**Vice-President**

Carter Newell

**Secretary-Treasurer**

Thomas M. Soniat

**Member-at-Large (1989-1992)**

Monica Bricelj

Congratulations to members of the 1989-90 EXCOM. All NSA members are reminded to send correspondence related to dues, address changes and other membership matters to the newly elected Secretary-Treasurer Tom Soniat. Some NSA members may occasionally find it difficult to contact Tom by phone. He suggests the following: My lab number is 504-286-7042. If you can't first get me there, dial 286-6309 and leave a message; I will return your call. I also have no objection if you call me at home (482-6905).



Officers Committee Chairs and Staff of the 1989-90 NSA include: front row, Diane Brousseau, Scott Siddall, Sandy Shumway and Roger Mann. Back row, Tom Soniat, Arnold Eversole and Victor Kennedy. Absent from the photo are Carter Newell, Monica Bricelj, George Abbe, Jeff Kassner, Chris Nelson, John Ewart and Mike Castagna.





President-Elect Scott Siddall (r) accepts the President's gavel from Roger Mann at the NSA Awards luncheon in Los Angeles.

### Summary of the 1989 Annual Business Meeting

For the second year in a row, the annual business meeting was held as part of the NSA Awards Luncheon. This year, for the first time, Ken Chew's traditional Chinese dinner was featured on the menu. Outgoing President Roger Mann thanked those members who had carried out various jobs in the organization during the year. Especially important to the success of this year's meeting were Vic Kennedy (program), Ed Rhodes (meeting registration), Ken Chew (NSA representative to the Aquaculture '89 Steering Committee), Scott Siddall, Sandy Shumway and everyone else who helped out at the NSA table in the Aquaculture '89 registration area.

Secretary-Treasurer Ed Rhodes presented the financial report with a summary of the Associations accounts of the three cost centers and Membership Committee Chair Jeff Kassner reported that as of February 1989 the National Shellfisheries Association had a membership of 817. However, only 649 members were current in their 1988 dues and it is difficult to determine how many of the 168 individuals in arrears will renew their memberships. Jeff also reported that student memberships are low (70 students) and indicated that increasing the number of students in NSA should be a priority of the Association. He urged all University affiliated members to recruit new student members.

Honorary Membership Committee Chairman John Manzi announced that two individuals, Bob Ingle and Ken Chew, were selected by the NSA Executive Committee to receive NSA Honored Life Membership Awards. John reviewed Bob and Ken's career accomplishments as shellfish biologists and NSA officers. Winston Menzel accepted the award (a framed certificate) on Bob's behalf and Ken was present to accept his award.

President Mann then passed on the gavel to President-Elect Scott Siddall who jokingly presented Roger with a very small wall plaque to commemorate his shortened term (nine months) as NSA President. Scott indicated that during his term as President, he will work to strengthen linkages with the Pacific Coast Section of NSA (PCS), Pacific Coast Oyster Grower's Association (PCOGA) and the Shellfish Institute of North America (SINA). President Siddall then appointed the following individuals to serve as committee chairs and members:

<b>Audit-Budget-Finance:</b>	George Abbe
<b>Honorary Membership:</b>	Jeff Kassner
<b>Presidents:</b>	Roger Mann
<b>Membership:</b>	Chris Nelson
<b>Elections:</b>	Roger Mann
<b>members:</b>	Scott Siddall Vic Kennedy
<b>Program:</b>	Carter Newell
<b>Publications:</b>	Michael Castagna
<b>members:</b>	Roger Mann Sandra Shumway Mel Carriker
<b>Resolutions:</b>	Monica Bricelj
<b>Site Selection:</b>	Vic Kennedy
<b>members:</b>	Scott Siddall Carter Newell Ralph Elston
<b>Arrangements:</b>	Roger Mann

### NATIONAL SHELLFISHERIES ASSOCIATION BUDGET SUMMARIES FOR FISCAL YEARS 1987-88, 88-89 & 89-90 (Prepared 2/8/89)

	Actual FY 87-88	Projected FY 88-89	Proposed FY 89-90
<b>Administrative Cost Center:</b>			
Revenues	\$17,253.49	\$21,450.00	\$21,500.00
Expenses	<u>2,224.91</u>	<u>1,500.00</u>	<u>2,850.00</u>
Net	+ \$15,028.58	+ \$19,950.00	+ \$18,650.00
<b>Publications Cost Center:</b>			
Revenues	\$20,910.00	\$27,195.00	\$26,725.00
Expenses	<u>29,474.21</u>	<u>53,900.00</u>	<u>37,375.00</u>
Net	- \$ 8,564.25	- \$26,705.00	- \$10,650.00
<b>Annual Meeting Cost Center:</b>			
Revenues	\$21,127.97	\$11,945.00	\$19,000.00
Expenses	<u>26,079.04</u>	<u>6,000.00</u>	<u>19,000.00</u>
Net	- \$ 4,951.07	+ \$ 5,945.00	0.00
<b>GRAND TOTAL</b>			
	+ \$ 1,513.30	- \$ 810.00	+ \$ 8,000.00



Roger Mann); "Water Quality and Toxins" (Moderator: Dorothy Leonard); "Quahog Culture; State of the Art" (Moderator: Mike Castagna); "Molluscan Disease" (Moderator: Susan Ford); "West Coast Molluscan Aquaculture" (Moderators: Christine Hodgson and Ian Whyte); and a joint NSA/WAS session on "Mussel Culture" (Moderators: Carter Newell and Glen Jamieson).

The recipient of this year's Thurlow C. Nelson Award for the best student paper was Greg Tracey, Science Applications International Corporation, c/o U.S. Environmental Protection Agency, Narragansett, Rhode Island, for his presentation entitled "Effects of Inorganic and Organic Nutrient Enrichment on Growth and Bioenergetics of the Blue Mussel, *Mytilus edulis*." Congratulations to Greg for his interesting research and well prepared presentation.

This year's selection of the Nelson Award winners was made by a committee headed by Sandy Shumway and included Mel Carriker and Jeff Kassner. Papers were judged on the basis of scientific content, presentation, quality of visual aids and handling of questions. Thanks to Sandy, Mel and Jeff for evaluating all of the student papers presented this year.

### Pacific Coast Section of NSA

Dan Cheney 1989 Program Chairman of the Pacific Coast Section of NSA, reports that their upcoming annual meeting will be held jointly with the Pacific Coast Oyster Growers' Association (PCOGA) from noon Thursday the 21st to noon Saturday the 23rd of September at the Hyatt Hotel in Seattle, Washington. All members of the NSA are invited to attend, especially those members who weren't able to make it to the last annual NSA meeting at Aquaculture '89. Anyone planning to present a paper/poster should have an abstract submitted no later than June 15. For further information on the meeting

and instructions for submitting abstracts contact: Chris Langdon, Hatfield Marine Science Center, Oregon State University, 2030 South Marine Science Drive, Newport, Oregon (503) 867-3011.

### Journal of Shellfish Research

JSR editor Sandy Shumway reports that the Journal is now back on track and that all members should have received Volume 7, Numbers 1-4. If you have not received your copy, notify Sandy. Volume 8 (1) has been sent to the publisher and will be mailed in June. Manuscript submissions have increased and the acceptance rate is currently about 70%. If you are interested in serving as a reviewer, contact Sandy soon. Remember, this is your Journal and it needs your support. Recommend it to your colleagues and students and be sure your library subscribes!

### Audit-Budget-Finance Update

Audit-Budget-Finance Committee Chair George Abbe reports that total revenues for the 1987-88 fiscal year were \$59,292.26, and expenses totalled \$57,778.16 for a net gain of \$1,514.10. However, since we produced four issues of the JSR in 1988, much of which will be paid for in the 1988-89 fiscal year, we have projected publication revenues to be \$27,195 and publication expenses to be \$53,900 for a net loss of \$26,705. We are confident that this deficit will be covered by our increased dues and by profits from our annual meeting in Los Angeles which was part of Aquaculture '89.

Our proposed budget for the 1989-90 fiscal year, which doesn't begin until 1 October, shows a net gain of \$18,650 in administrative costs, a net loss of \$10,650 in publication costs, and a break-even position on meeting costs for the 1990 meeting in Williamsburg, Virginia. This would yield a net gain for the Association of \$8,000 in 1989-90.

### Employment Opportunities

**Masters Level Assistantships** - are available in the Department of Biological Sciences at the University of New Orleans. The stipend is \$7,286 per academic year and requires teaching duties of approximately 6 hours per week. Research assistantships are occasionally available. Shellfish research opportunities exist in the fields of oyster and blue-crab biology. If interested, apply before 1 July for the fall to: Dr. John C. Francis, Graduate Coordinator, Department of Biological Sciences, University of New Orleans, Lakefront, New Orleans, LA 70148.

**Position Available** - Hard clam culture: hatchery, nursery, field growout, commercial scale facility. Stock assessment/population dynamics. Hatchery experience and diving certification preferred. Contact: Dr. Stuart C. Buckner, Deputy Commissioner, Dept. of Environmental Control, Town of Islip, 401 Main St., Islip, NY 11751 (516) 224-5646.

**Hatchery Person** - to work at well established and expanding oyster and clam sea farm on San Juan Island, Washington. Degree in fisheries biology/oceanography preferred. Two year commitment desired. Send CV with references to: Westcott Bay Sea Farms, 4071 Westcott Dr., Friday Harbor, WA 98250 or call Doree Webb (206)378-2489.

**Extension Agent** - for the American Pacific Islands. Provide on-site training in giant clam aquaculture, serve as contact on marine related issues for US government agencies. Annual salary is \$19-26,000 with housing. Contact: Ishmael Lebehn, Director, Agricultural Research Station, College of Micronesia, Drawer F, Kolonia, Pohnpei, Eastern Caroline Islands 96941.



## Meetings, Courses Etc.

An International Workshop on Problems of Algal Blooms in Aquaculture will be held June 14-16, 1989 at the Sherkin Island Marine Station, Ireland. For more information, contact: Matt Murphy, Sherkin Island Marine Station, Sherkin Island, County Cork, Ireland Tel. 028-20187 (Ireland) + 358 + 28 20187 (International).

The Aquaculture Association of Canada's annual meeting and trade show AAC '89 will be held July 10-14, 1989 at the Radisson Plaza Hotel in St. John's, Newfoundland. For more information, contact: Dr. Patrick Dabinett, Marine Sciences Research Laboratory, Memorial University of Newfoundland, St. John's, Newfoundland A1C 5S7 (709) 726-6681 Fax: (709) 737-4569.

The Sixth Symposium on Coastal and Ocean Management, Coastal Zone '89 will be held from July 11-14, 1989 in Charleston, South Carolina. For More information, contact: Delores Clark, NOAA Office of Constituent Affairs, Rockville, MD 20852 (301) 443-8031.

The Tenth International Malacological Congress will be held from August 27-September 2, 1989 in Tubigen, Federal Republic of Germany. For additional information, contact: Dr. Claus Meier-Brook, President, Unitas Malacologica, Tropenmed. Inst. d. Univ., Wilhelmstr. 31, D-47000 Tubigen, Federal Republic of Germany.

## Missing NSA Members

The following NSA members can't be located for lack of a forwarding address. Please let Tom Soniat know of their whereabouts if you have that information.

A.J. Battistone, 431 N. 24th Street, Phoenix, AZ 85008

Kwang-Sik Choi, Dept. of Oceanography, Texas A&M University, College Station, TX 77843

Nancy E. Helm, Peace Corps, P.O. Box 880, Apia, Western Samoa

Alex P. Ma, P.O. Box 643, Ocean Star Int., Inc., Snowville, UT 84436

Charles McCarthy, P.O. Box 1674, Southold, NY 11971

Mattana Sanguanruang, School of Forestry, Fisheries and Wildlife, LSU, Baton Rouge, LA 70803.

Russell McMillan, 5928 Armour Dr. SE, Lacey, WA 98503.

Barbara Scully, RR #1, Box 2590, N. Edgcomb, ME 04556

## Contributions to the NSA Quarterly Newsletter

The purpose of the NSA Quarterly Newsletter is to develop communication between members of the NSA and to serve as a forum for the distribution of information of interest to the membership. The newsletter is published four times a year (spring, fall, winter, and ballot -late winter-) and prints items relating to NSA business matters, the Journal of Shellfish Research, recent publications, future meetings, job opportunities, activities of other professional societies and miscellaneous items of interest. The newsletter is produced on an IBM PC using WordPerfect 4.2 (5.0 accepted) and Ventura Publisher software. Whenever possible, your contribution (text) should be accompanied by a 5 1/4 inch diskette as either a WordPerfect or DOS text file. Camera ready text should be typeset or laser printed with 7 1/2 inch margins to insure compatible type size when reduced. All members are encouraged to submit materials by the appropriate deadline to:

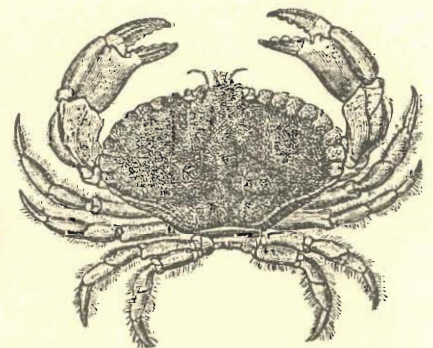
John W. Ewart, Editor  
NSA Quarterly Newsletter  
College of Marine Studies  
University of Delaware  
Lewes, DE 19958  
(302) 645-4060  
FAX: 645-4028

The deadline for submitting material for the next (summer) issue of the newsletter is July 15, 1989.

## Other Professional Organizations

**Shellfish Farmers Association** - A new association supporting the process of shellfish farming has been formed. The Shellfish Farmers Association (SFA) was developed to encourage shellfish farming, represent shellfish farmer's interests, identify and help resolve industry problems, provide marketing assistance for farmed shellfish and cooperate with other farm or water dependent industries with common interests. The Association, currently based in Florida, is working to expand its activities to help meet the needs of all shellfish farmers. Anyone interested or involved in shellfish aquaculture is invited to join its growing organization. A newsletter is scheduled for release soon to provide better communication among members on the various issues affecting shellfish farming today. For additional information about the SFA contact: The Shellfish Farmers Association, 480 River Prado Road, Fort Pierce, FL 34946 (407) 466-2013.

**The International Association of Astacology (IAA)** has recently published a directory of their membership. The directory, in alphabetical order, contains names, addresses and telephone/ Fax numbers of individual members as well as their special interests and species studied. For more information about the IAA and its membership directory, contact: Dr. Jay Huner, International Association of Astacology, P.O. Box 44650, University of Southwest Louisiana, Lafayette, LA 70504 (318) 231-5239.





## NOAA's National Estuarine Inventory

The National Estuarine Inventory (NEI) is a series of related activities of NOAA's Office of Oceanography and Marine Assessment (OMA) to develop a national estuarine database and assessment capability. The NEI was initiated in 1983 as part of NOAA's program of strategic assessments of the Nation's coastal and oceanic resources. No comprehensive inventory or data base for the Nation's estuaries could be found prior to the NEI in spite of the high value, intense use, frequent overuse, and thousands of scientific studies related to various aspects of estuaries. To date, six data atlases, twelve data bases, and numerous reports and assessments have been or are being produced. Without this fundamental set of information developed for the NEI, it is impossible to analyze or compare the estuaries that make up the Nation's estuarine resource base.

The cornerstone of the NEI is the National Estuarine Inventory Data Atlas. Volume 1, completed in November 1985, identifies 92 of the most important estuaries and subestuaries of the contiguous USA, presents information through maps and tables on physical and hydrologic characteristics of each estuary, and

specifies a commonly derived spatial unit for all estuaries, the estuarine drainage area (EDA), for which data are compiled. These estuaries represent approximately 90 percent of the estuarine water surface area and 90 percent of the freshwater inflow to estuaries of the East Coast, West Coast, and Gulf of Mexico. Volume 2 presents area estimates for seven categories and 24 subcategories of land use as well as 1970 and 1980 population estimates. Land use data are compiled for three spatial units: (1) the estuarine drainage area; (2) U.S. Geological Survey hydrologic cataloging units; and (3) counties that intersect EDAs. Population estimates are compiled for EDAs only. With these two volumes the NEI represents the most consistent and complete set of data ever developed for the Nation's estuarine resource base. Additional volumes are being developed for wetlands, nutrient discharges, pesticide use, and public outdoor recreational facilities.

The data base and assessment capability under development for the NEI are part of a dynamic and evolving process. Other estuaries and subestuaries are being added to the NEI from the West Coast and the Gulf of Mexico. Refinements are being made to physical and hydrologic data estimated in Volume 1. Additional estuarine attributes such as volume

and flushing rates have been added to the data base. Other NOAA projects whose data and information will be included in the NEI are: the distribution of estuarine-dependent living marine resources, characterization of estuarine shoreline types, characterization of bottom sediments, assessment of eutrophication potential for all NEI estuaries, the National Coastal Wetlands Data Base, the **National Shellfish Register** and related projects, the National Coastal Pollutant Discharge Inventory, and the Inventory of Outdoor Coastal Recreation Facilities.

Additional information on NOAA's National Estuarine Inventory is available from:

Strategic Assessment Branch  
(N/OMA31)  
Ocean Assessments Division  
National Oceanic and  
Atmospheric Administration  
11400 Rockville Pike  
Rockville, Maryland 20852

## HOW TO JOIN

— Fill out and mail a copy of the application blank below. The 1989 dues are **ONLY \$30(US)** per year (\$20 for students) and that includes the *Journal* and the Newsletter!

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### NATIONAL SHELLFISHERIES ASSOCIATION — APPLICATION FOR MEMBERSHIP (NEW MEMBERS ONLY)

Name: \_\_\_\_\_ For the calendar year: \_\_\_\_\_ Date: \_\_\_\_\_

Mailing address: \_\_\_\_\_

Institution affiliation, if any: \_\_\_\_\_

Shellfishery interests: \_\_\_\_\_

Regular or student membership: \_\_\_\_\_

Student members only — advisor's signature **REQUIRED:** \_\_\_\_\_

Make cheques (**MUST** be drawn on a US bank) or international postal money orders payable to the National Shellfisheries Association and send to Tom Soniat, Dept. of Biological Sciences, Univ. of New Orleans—Lakefront, New Orleans, LA 70148, USA.



**NSA MEMBERS' DISCOUNT PROGRAM**  
**for Elsevier's**  
**"DEVELOPMENTS IN AQUACULTURE AND FISHERIES SCIENCE" series**  
**(30% DISCOUNT)**

Vol.	Author	Title	List price	Members' price
1	Korringa	Farming Marine Organisms Low in the Food Chain (1976)	\$ 79.00	\$ 56.00
2	Korringa	Farming the Cupped Oysters of the Genus <i>Crassostrea</i> (1976)	\$ 79.00	\$ 56.00
3	Korringa	Farming the Flat Oysters of the Genus <i>Ostrea</i> (1976)	\$ 79.00	\$ 56.00
4	Korringa	Farming Marine Fishes and Shrimps	\$ 79.00	\$ 56.00
7	Lutz	Mussel Culture and Harvest: A North American Perspective (1980)	\$100.00	\$ 70.00
8	Hara	Chemoreception in Fishes (1982)	\$126.25	\$ 89.00
9	Boyd	Water Quality Management for Pond Fish Culture (1982)	\$ 94.75	\$ 67.00
13	Allen, <i>et al.</i>	Bioeconomics of Aquaculture (1984)	\$110.50	\$ 78.00
15	Tucker	Channel Catfish Culture (1985)	\$142.00	\$100.00
16	Bird and Benson	Seaweed Cultivation for Renewable Resources (1987)	\$118.50	\$ 83.00
17	Sindermann & Lightner	Disease Diagnosis and Control in North American Marine Aquaculture (1988)	\$105.25	\$ 74.00
18	Saila, <i>et al.</i>	BASIC Fishery Science Programs (1988)	\$ 73.75	\$ 52.00
19	Manzi & Castagna	Clam Mariculture in North America (1989)	\$118.50	\$ 83.00
20	Huguenin & Colt	Design and Operating Guide for Aquaculture Seawater Systems (1989)	\$ 76.25	\$ 54.00

**OTHER ELSEVIER BOOKS OF INTEREST:**

Chapman	Wet Coastal Ecosystems (1977)	\$116.00	\$ 82.00
Gall	Genetics in Aquaculture II (1987)	\$121.00	\$ 85.00
Ketchum	Estuaries and Enclosed Seas (1983)	\$226.50	\$159.00
Okaichi	Red Tides (1988)	\$ 85.00	\$ 60.00
Stadler	Algal Biotechnology (1988)	\$ 99.00	\$ 70.00
Straskraba	Freshwater Ecosystems (1985)	\$113.25	\$ 80.00



Quantity	Author - Title	NSA Members' price	Total

**TOTAL ORDER:** \$ \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_  
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